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**Search details**

B3 breast lesions and vacuum-assisted biopsy

**Resources searched**

NHS Evidence; TRIP Database; Cochrane Library; CINAHL; EMBASE; MEDLINE; Google Scholar

**Database search terms:**
- b3 adj2 lesion*
- breast*
- mammar*
- exp BREAST
- nipple*
- NIPPLES
- lesion* adj2 malignant*
- lesion* adj2 potential*
- "flat epithelial atypia"
- "lobular intraepithelial neoplasia"
- "atypical ductal hyperplasia"
- ADH
- "columnar cell hyperplasia"
- "columnar cell metaplasia"
- "ductal intraepithelial neoplasia"
- "lobular hyperplasia"
- "lobular carcinoma"
- "LCIS/CLIS"
- "LN/LIN"
- "DIN 1a"
- LIN
- "atyypical intraductal proliferation"
- "ductal intraepithelial neoplasia"
- DIN 1b
- biops* adj2 "vacuum assisted"
- biops* adj2 vacuum
- BCAV
- BIOPSY
- VACUUM

**NHS Evidence search string:**

(b3 lesion* OR "flat epithelial atypia" OR "lobular intraepithelial neoplasia" OR "atypical ductal hyperplasia" OR ADH OR "columnar cell hyperplasia" OR "columnar cell metaplasia" OR "ductal intraepithelial neoplasia" OR "lobular hyperplasia" OR "lobular carcinoma" OR "LCIS/CLIS" OR "LN/LIN" OR "DIN 1a" OR LIN OR "atyypical intraductal proliferation" OR "ductal intraepithelial neoplasia" OR "DIN 1b") ("vacuum assisted" biops*) OR BCAV (breast* OR mammar* OR nipple*)

**Google search string:**

("b3 lesion*" OR (b3 (lesion OR lesions) OR "uncertain malignant potential") ~breast "vacuum-assisted biopsy"
**Summary**

There has been a huge amount of research published on vacuum-assisted biopsies for breast lesions. Given the broad nature of the search it is not possible to summarise the literature for you.

**Guidelines**

**National Breast and Ovarian Cancer Centre**

The clinical management of ductal carcinoma in situ, lobular carcinoma in situ and atypical hyperplasia of the breast 2003

The large tissue volume obtained with directional, vacuum-assisted large core-needle biopsy using 11-gauge needles improves the diagnosis of ADH by core biopsy. However, it does not entirely eliminate the risk of missing areas of DCIS and invasive breast cancer.

**National Guidelines Clearinghouse**

ACR Appropriateness Criteria® nonpalpable mammographic findings (excluding calcifications) 2010

Technical success is reported in as many as 98% of cases, and an average of ≥10 samples using 11-gauge vacuum-assisted needles improves accuracy and decreases (but does not eliminate) possible upgrades from atypical ductal hyperplasia to cancer or ductal carcinoma in situ to invasive carcinoma. US-guided core biopsy, typically used to sample masses, may be successfully performed using either automated 14-gauge needles or vacuum-assisted devices and should include four or more nonfragmented samples. Similar to any percutaneous biopsy sampling, the final assessment as to follow-up recommendations must include strict vigilance regarding imaging and pathology correlation.

**NHS Cancer Screening Programme**


NHSBSP 50: Guidelines for non-operative diagnostic procedures and reporting in breast cancer screening 2001

**Evidence-based reviews**

**Cochrane Central Register of Controlled Trials**

Minimizing underestimation rate of microcalcifications excised via vacuum-assisted breast biopsy: a blind study 2008

This recently introduced, "extended" way of performing VABB in microcalcifications safely minimizes the underestimation rate, which may lead to a modified management of ADH lesions.

**Database of Abstracts of Reviews of Effects**

Diagnostic value of vacuum-assisted breast biopsy for breast carcinoma: a meta-analysis and systematic review 2010

VAB was a highly sensitive and specific biopsy method for assessing suspected breast cancer detected by mammography in women.
1. New patient pathway using vacuum-assisted biopsy reduces diagnostic surgery for B3 lesions.

**Author(s):** Rajan S, Shaaban AM, Dall BJ, Sharma N

**Citation:** Clinical Radiology, March 2012, vol./is. 67/3(244-9), 0009-9260;1365-229X (2012 Mar)

**Publication Date:** March 2012

**Abstract:** AIM: To assess the clinical impact of a new patient management pathway incorporating vacuum-assisted biopsy for lesions of uncertain malignant potential (B3). MATERIALS AND METHODS: A retrospective analysis was undertaken of all B3 lesions on core biopsy in the pathology database from April 2008 to April 2010. Outcome measures assessed included final histological diagnosis, frequency of diagnostic surgical biopsy, and impact on management. RESULTS: In the old pathway, there were 95 B3 lesions, of which 14% (13/95) were planned for vacuum-assisted biopsy and 86% (82/95) for surgical biopsy. In the new pathway, there were 94 B3 lesions, of which 68% (64/94) were planned for vacuum-assisted biopsy and 32% (30/94) for surgical biopsy. Following further sampling with vacuum-assisted biopsy, only 13% of patients required diagnostic surgical biopsy and in 25% of cases, a preoperative diagnosis of carcinoma was reached allowing patients to proceed to therapeutic surgery. CONCLUSION: The new pathway has reduced the number of benign diagnostic surgical biopsies performed and increased the preoperative diagnosis of breast cancer. Copyright Copyright 2011 The Royal College of Radiologists. Published by Elsevier Ltd. All rights reserved.

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2. Underestimation rate of invasive malignancy in atypical lobular hyperplasia (ALH) and lobular in Situ carcinoma (LCIS)

**Author(s):** Guyon L., Hamy A.S., De Roquancourt A., Giacchetti S., Cuvier C., De Bazelaire C., Albiter M., Boursyn E., Cahen-Doidy L., Espie M.

**Citation:** European Journal of Cancer, March 2012, vol./is. 48/(S178), 0959-8049 (March 2012)

**Publication Date:** March 2012

**Abstract:** Background: The management of atypical lobular hyperplasia (ALH) and lobular in situ carcinoma (LCIS) discovered on breast biopsies is still controversial. Some authors do not recommend surgical excision, and up to one third of the patients in the literature undergo radiological follow up. The aim of this study was to assess the risk of invasive malignancy when ALH and LCIS are diagnosed on breast biopsy. Methods: All cases of ALH and LCIS diagnosed by percutaneous biopsy at Saint-Louis hospital, (Paris, France), between January 2000 and January 2011 were identified from the computerized database of pathological reports. Patients' characteristics, clinical, radiological patterns and subsequent management and outcome were collected from medical records. Cases with an invasive lesion coexisting with ALH and LCIS and patients with missing pathological data after biopsy were excluded from the study. Results: One hundred and seven pathological reports were identified, and 87 medical records were available for analysis. (ALH, n = 45, LCIS n = 46). 69 lesions were diagnosed by vacuum assisted biopsy (79.3%) and 18 by core needle biopsy (20.7%). 67 lesions (77%) (ALH n = 25 LCIS n = 42) were further managed by excision, either by lumpectomy (n = 53, 79%) or by mastectomy (n = 14, 21%). An invasive cancer (4 lobular, 3 ductal and 1 undetermined) was found in 8 of the 67 excision-based specimens, leading to an underestimation rate of the biopsy of 11.9% for excised specimens (14.3% for CLIS and 8% for ALH). Five patients were lost to
follow-up. After a mean follow-up of 39 months, 2 additional ipsilateral (3.2%) and 3 contralateral (4.8%) invasive cancers were diagnosed. 20 lesions were managed by observation (ALH=18 and LCIS=2). After a mean follow-up of 40 months, 3 ipsilateral (15%) and 2 contralateral (10%) invasive malignancies were diagnosed. Conclusion: Given the significant rate of under-estimation of invasive malignancy, we recommend to excise both atypical lobular hyperplasia and lobular in situ carcinoma when discovered on core biopsies. Predictive factors of under-estimation should be investigated and validated before this attitude can give way to radiological follow-up. Despite surgery, the risk of cancer remains high. The early diagnosis after biopsy suggests that multifocal or bilateral lesions pre-existed and that a meticulous local assessment is necessary. MRI could be a useful tool regarding this issue.

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3. Stereotactic vacuum-assisted breast biopsy. Correlation with surgical excisional biopsy [Spanish] Biopsia mamaria asistida por vacio y guiada por estereotaxia. Correlacion con la biopsia quirurgica

Author(s): Plaza Loma S., Rodriguez de Diego Y., Gonzalez Blanco I., Martin Medrano E., Del Villar Negro A., Torres Nieto A.

Citation: Progresos de Obstetricia y Ginecologia, February 2012, vol./is. 55/2(66-70), 0304-5013;1578-1453 (February 2012)

Publication Date: February 2012

Abstract: Objective: To evaluate the efficiency of stereotactic vacuum-assisted core breast biopsy as an alternative to diagnostic surgical biopsy. Material and methods: A retrospective study based on 250 stereotactic vacuum-assisted percutaneous biopsies was conducted from March 2006 to August 2010. The false-negative rate and underestimation of disease at percutaneous biopsy were determined in comparison with diagnostic surgical biopsy. Results: The false-negative rate was 2% (1/63) and the positive predictive value was 100%. Surgical excision revealed carcinoma in 30% (3/10) of the patients with atypical ductal hyperplasia at core biopsy and in 33.3% (2/6) of those with lobular carcinoma in situ. Among 40 lesions diagnosed as ductal carcinoma in situ at vacuum-assisted biopsy, surgery revealed invasive carcinoma in four (10%). Conclusions: Stereotactic core breast biopsy can be considered a valid alternative to diagnostic surgical biopsy, although diagnostic underestimation still occurs. 2011 SEGO.

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4. Scoring to predict the possibility of upgrades to malignancy in atypical ductal hyperplasia diagnosed by an 11-gauge vacuum-assisted biopsy device: an external validation study.


Citation: European Journal of Cancer, January 2012, vol./is. 48/1(30-6), 0959-8049;1879-0852 (2012 Jan)

Publication Date: January 2012

Abstract: BACKGROUND: Ko's scoring system was developed to predict malignancy upgrades in patients diagnosed with atypical ductal hyperplasia by core needle biopsy. The Ko algorithm was able to identify a subset of patients who were eligible for exclusively clinical follow-up. The current study statistically investigated the patient outcomes to determine whether this scoring system could be translated and used safely in clinical practice.METHODS: We tested the statistical performance of the Ko scoring system against an external independent multicentre population. One hundred and seven cases of atypical ductal hyperplasia diagnosed by an 11-gauge biopsy needle were available for
inclusion in this study. The discrimination, calibration and clinical utility of the scoring system were quantified. In addition, we tested the underestimation rate, sensitivity, specificity, and positive and negative predictive values according to the score threshold.

**RESULTS:** The overall underestimation rate was 19% (20/107). The area under the receiver operating characteristic curve for the logistic regression model was 0.51 (95% confidence interval: 0.47-0.53). The model was not well calibrated. The lowest predicted underestimation rate was 11%. The sensitivity, specificity, positive predictive value, and negative predictive values were 90%, 22%, 20%, and 89%, respectively, according to the most accurate threshold proposed in the original study.

**CONCLUSION:** The scoring system was not sufficiently accurate to safely define a subset of patients who would be eligible for follow-up only and no additional treatment. These results demonstrate a lack of reproducibility in an external population. A multidisciplinary approach that correlates clinicopathological and mammographic features should be recommended for the management of these patients. Copyright Copyright 2011 Elsevier Ltd. All rights reserved.

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### 5. What is the significance of flat epithelial atypia and what are the management implications?

**Author(s):** Rajan S, Sharma N, Dall BJ, Shaaban AM

**Citation:** Journal of Clinical Pathology, November 2011, vol./is. 64/11(1001-4), 0021-9746;1472-4146 (2011 Nov)

**Publication Date:** November 2011

**Abstract:**

**AIMS:** To assess the significance of flat epithelial atypia (FEA) on core biopsy by evaluating the proportion of cases upgraded to in-situ and invasive carcinoma on further sampling with vacuum-assisted biopsy (VAB) or diagnostic surgical biopsy.

**METHODS:** A retrospective analysis was performed of all core biopsies containing FEA and/or atypical intraductal proliferation (AIDP) in the pathology database from April 2008 to April 2010 (n=90). Before April 2009, the majority of core biopsies containing FEA and/or AIDP proceeded to surgical biopsy. From April 2009 onwards, a new patient management pathway was introduced incorporating VAB to sample core biopsies containing FEA and/or AIDP as an alternative to surgical biopsy.

**RESULTS:** Of 90 core biopsies, the following were identified: FEA only in 42%; FEA with concomitant AIDP in 21% and AIDP only in 37%. There was a stepwise increase in the proportion of cases upgraded to in-situ or invasive carcinoma: 19% in the FEA group; 29% in the FEA and AIDP group and 53% in the AIDP group. In the FEA-only group, one invasive tumour (grade 1 tubular carcinoma) and six cases of ductal carcinoma in situ were found.

**CONCLUSION:** The presence of FEA on core biopsy warrants further tissue sampling to ensure concomitant malignancy is not missed. Sampling with VAB provides sufficient tissue for histopathological evaluation, reducing the need for surgical biopsy. It is important that the utilisation of VAB is incorporated into a safe patient management pathway with careful multidisciplinary team discussion to ensure radiological-pathological concordance.

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### 6. What pathology is an indication for vacuum-assisted biopsy?

**Author(s):** Shuen W.M.V., Currie R.J.

**Citation:** Breast Cancer Research, November 2011, vol./is. 13/(S13), 1465-5411 (04 Nov 2011)

**Publication Date:** November 2011

**Abstract:** Introduction Vacuum-assisted biopsies (VABs) are used for both diagnostic and
treatment purposes. Currently there are no set guidelines in our department as to who should proceed to a VAB. The purpose of this study is to analyse the indication for a VAB, the upgrade or downgrade rate when compared with the initial core biopsy and the overall final outcome of these patients. Methods A retrospective search of all VABs performed from 1 April 2009 to 31 March 2010 was identified. The indication for VAB, the initial core biopsy results and the vacuum biopsy results and final outcomes were recorded. Results A total of 37 VABs were performed within the year. Two were for treatment excision of fibroadenoma. A total of 35 were diagnostic VABs. Three went straight to vacuum biopsies due to either a small lesion or suspicion for a recurrent malignancy. Of the remaining 32 cases, 21 were for indeterminate M3/U3/B3 lesions, five for clinical and pathological mismatch, three for further clarification of core biopsy result, two for staging the extent of the tumour, and one for inadequate core biopsy. Thirteen out of 32 (40.6%) were upgraded from the initial biopsy, 10 proceeded to further procedures. Six out of 32 (18.8%) remained the same grade, two (33.3%) required further procedure. Thirteen out of 32 (40.6%) were downgraded, five (38.5%) proceeded to further procedures. Conclusion Our audit has shown VAB is useful in providing a definitive diagnosis in a range of breast pathology, in particular B3 lesions. We therefore strongly advise its use in cases of pathological uncertainty to save patients from further unnecessary interventions.

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7. Outcomes following B3/B4 needle core biopsy in South East London Breast Screening Service 2000 to 2010

Author(s): Lynes K., Nikolopoulos I., Akbar N., Michell M., Thakur K.

Citation: Breast Cancer Research, November 2011, vol./is. 13/(S3), 1465-5411 (04 Nov 2011)

Publication Date: November 2011

Abstract: Introduction Needle core biopsy (NCB) is frequently used in assessing screen-detected breast lesions. Uncertainty remains over appropriate management of NCBs reported as ‘uncertain malignant potential’ (B3) or ‘suspicious of malignancy’ (B4). This study aims to analyse a large screening dataset to establish positive predictive values (PPVs) for malignancy on excision biopsy, for different classifications of B3 and for B4 NCBs. Methods Retrospective analysis was conducted of prospectively collected data for South East London Breast Screening Service. A total of 5,324 patients underwent NCB between 2000 and 2010, including 14G (ultrasound-guided) and 10G vacuum-assisted biopsies (stereoguided). A total of 444 were B3 (8.3%) and 38 (0.7%) were B4. NCBs reported as B3 were classified by pathological subtype and PPVs for malignancy calculated for each subtype. Outcomes following B4 NCB were also assessed. Results The overall PPV for malignancy for B3 NCBs was 25% and for B4 NCBs was 74%. The PPVs for each subtype of B3 classification were as follows: papillary 14%, atypical intraductal epithelial proliferation 35%, phyllodes 11%, lobular 47%, complex sclerosing lesion/radial scar 6%, columnar cell 29%. Conclusion Our findings indicate that NCBs reported as B4 should be excised as they have a high likelihood of malignancy on excision biopsy. The PPVs for subtypes of B3 NCBs vary considerably. However, B3 subtypes with atypia should be treated with a higher level of suspicion and preferably be surgically excised. Decisions regarding further assessment should be made in a multidisciplinary setting.

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8. Atypical ductal hyperplasia diagnosed at 11-gauge vacuum-assisted breast biopsy performed on suspicious clustered microcalcifications: could patients without residual microcalcifications be managed conservatively?

**Author(s):** Villa A, Tagliafico A, Chiesa F, Chiaramondia M, Friedman D, Calabrese M

**Citation:** AJR. American Journal of Roentgenology, October 2011, vol./is. 197/4(1012-8), 0361-803X;1546-3141 (2011 Oct)

**Publication Date:** October 2011

**Abstract:** OBJECTIVE: The purpose of our study was to establish whether it might be safe for women with a diagnosis of atypical ductal hyperplasia (ADH) at stereotactically guided vacuum-assisted breast biopsy without any residual microcalcification after the procedure to undergo mammographic follow-up instead of surgical biopsy. MATERIALS AND METHODS: From October 2003 to January 2009, 1173 consecutive 11-gauge vacuum-assisted breast biopsy procedures were performed. ADH was found in the specimens of 114 patients who underwent vacuum-assisted breast biopsy for a single cluster of suspicious microcalcifications smaller than 15 mm; 49 had residual microcalcifications, and 65 had microcalcifications completely removed by the procedure. Of 49 patients with residual microcalcifications, 41 underwent surgical biopsy. Of 65 patients without residual microcalcifications, 26 underwent surgical biopsy, 35 were not surgically treated and were managed conservatively with mammographic follow-up, and 4 had follow-up of less than 24 months. RESULTS: In 41 patients with residual microcalcifications who underwent surgical biopsy, 8 malignant lesions were found at surgery. The underestimation rate was 20% (8/41). In 26 patients without residual microcalcifications who underwent surgical biopsy, no malignant lesions were found. One malignant lesion was found in the 35 patients managed conservatively at follow-up. The underestimation rate in patients without residual microcalcifications using surgical biopsy or mammographic follow-up as the reference standard was 1.6% (1/61). CONCLUSION: Patients without residual microcalcifications after vacuum-assisted breast biopsy could possibly be managed in a conservative way with mammographic follow-up.

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9. All atypia diagnosed at stereotactic vacuum-assisted breast biopsy do not need surgical excision.

**Author(s):** de Mascarel I, Brouste V, Asad-Syed M, Hurtevent G, Macgrogan G

**Citation:** Modern Pathology, September 2011, vol./is. 24/9(1198-206), 0893-3952;1530-0285 (2011 Sep)

**Publication Date:** September 2011

**Abstract:** The necessity of excision is debatable when atypia are diagnosed at stereotactic vacuum-assisted breast biopsy (microbiopsy). Among the 287 surgical excisions performed at Institut Bergonie from 1999 to 2009, we selected a case-control study group of 151 excisions; 52 involving all the diagnosed cancers and 99 randomly selected among the 235 excisions without cancer, following atypical microbiopsy (24 flat epithelial atypia; 50 atypical ductal hyperplasia; 14 lobular neoplasia; 63 mixed lesions). Mammographical calcification (type, extension, complete removal) and histological criteria of epithelial atypia (type, number of foci, size/extension), topography and microcalcification extension at microbiopsy were compared according to the presence or absence of cancer at excision. Factors associated with cancer at excision were Breast Imaging Reporting and Data System (BI-RADS5) lesions, large and/or multiple foci of mammographical calcifications, histological type, number, size and extension of atypical foci. Flat epithelial atypia alone was never associated with cancer at excision. BI-RADS5, atypical ductal hyperplasia (alone or predominant) and >3 foci of atypia were identified as independent pejorative factors. There was never any cancer at excision when these pejorative factors were absent (n=31). Presence of one (n=59), two (n=23) or three (n=14) factors was associated with
cancer in 24, 15 and 13 cases with an odds ratio=5.8 (95% CI: 3-11.2) for each additional factor. We recommend that mammographical data and histological characteristics be taken into account in the decision-making process after diagnosis of atypia on microbiopsy. With experienced senologists and strict histological criteria, some patients could be spared surgery resulting in significant patient, financial and time advantages.

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**10. Accuracy of stereotactic vacuum-assisted biopsies in a community population**

**Author(s):** Edwards S.D., Vossen J.A., Pronovost M., Reeser P.

**Citation:** Journal of Clinical Oncology, September 2011, vol./is. 29/27 SUPPL. 1, 0732-183X (20 Sep 2011)

**Publication Date:** September 2011

**Abstract:** Background: Stereotactic core biopsy in mammographically detected lesions permits histologic confirmation previous to surgery planning. We evaluated the use of stereotactic vacuum-assisted biopsy (VAB) for diagnosing suspicious, mammographically detected breast lesions in a community population. Furthermore, we determined the level of agreement between the pathology findings of VAB and the final surgical excisional biopsy. Methods: We retrospectively evaluated the results of 128 consecutive stereotactic VAB with 9-gauge needles performed over a period of 1 year in our community population. The imaging histologic concordance was ascertained for each lesion. We also evaluated concordance between VAB results and surgical excision results. Results: For the 128 patients included Breast Imaging Reporting and Data System (BI-RADS) staging showed BI-RADS 3: 4%; BI-RADS 4: 91%; and BI-RADS 5: 5%. VAB demonstrated 65 (51%) benign lesions, 31(24%) indeterminate lesions and 32 (25%) malignant lesions. The 31 indeterminate lesions included atypical ductal hyperplasia (n=13), lobular neoplasia (n=4), papillary lesions (n=12), radial sclerosing lesions (n=5), and flat epithelial atypia (n=13). Surgical excision was performed on 52 patients, and pathology demonstrated; 4 benign, 19 indeterminate, and 29 malignant lesions. There was one (3%) underestimation of an indeterminate lesion and there were 8 (25%) underestimations of malignant lesions after surgical excision. We did not observe any post-biopsy complications. Conclusions: Stereotactic VAB with a 9-gauge needle is a reliable method for diagnosing mammographically detected breast lesions in a community population.

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**11. Positive predictive value for malignancy on surgical excision of breast lesions of uncertain malignant potential (B3) diagnosed by stereotactic vacuum-assisted needle core biopsy (VANCB): a large multi-institutional study in Italy.**


**Citation:** Breast, June 2011, vol./is. 20/3(264-70), 0960-9776;1532-3080 (2011 Jun)

**Publication Date:** June 2011

**Abstract:** Percutaneous core biopsy (CB) has been introduced to increase the ability of accurately diagnosing breast malignancies without the need of resorting to surgery. Compared to conventional automated 14 gauge needle core biopsy (NCB), vacuum-assisted needle core biopsy (VANCB) allows obtaining larger specimens and has recognized advantages particularly when the radiological pattern is represented by microcalcifications. Regardless of technical improvements, a small percentage of percutaneous CBs performed to detect breast lesions are still classified, according to European and UK guidelines, in the borderline B3 category, including a group of heterogeneous lesions with uncertain malignant potential. We aimed to assess the prevalence and positive predictive values (PPV) on surgical excision (SE) of B3 category
(overall and by sub-categories) in a large series of non-palpable breast lesions assessed through VANCB, also comparison with published data on CB. Overall, 26,165 consecutive stereotactic VANCB were identified in 22 Italian centres: 3107 (11.9%) were classified as B3, of which 1644 (54.2%) proceeded to SE to establish a definitive histological diagnosis of breast pathology. Due to a high proportion of microcalcifications as main radiological pattern, the overall PPV was 21.2% (range 10.6%-27.3% for different B3 subtypes), somewhat lower than the average value (24.5%) from published studies (range 9.9%-35.1%). Our study, to date the largest series of B3 with definitive histological assessment on SE, suggests that B3 lesions should be referred for SE even if VANCB is more accurate than NCB in the diagnostic process of non-palpable, sonographically invisible breast lesions. Copyright Copyright 2010 Elsevier Ltd. All rights reserved.

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Author(s): Londero V, Zuiani C, Linda A, Battigelli L, Brondani G, Bazzocchi M

Citation: European Radiology, June 2011, vol./is. 21/6(1200-6), 0938-7994;1432-1084 (2011 Jun)

Publication Date: June 2011

Abstract: OBJECTIVE: To compare malignancy underestimation rates in the case of percutaneous diagnosis of borderline breast lesions (B3) at 14-g core-needle-biopsy (CNB) and at 11-g vacuum-assisted-biopsy (VAB).METHODS: The histological results of 4764 image-guided breast biopsies were retrospectively reviewed. 300 B3, 151 benign papillomas, 88 radial sclerosing lesions, 46 lobular neoplasia, 15 atypical ductal hyperplasia diagnosed at ultrasound-guided 14-g CNB (76%) or stereotactically-guided 11-g VAB (24%) were identified. On average, 5 cores were obtained with CNB and 12 with VAB. Biopsy variables were reviewed and correlated with surgical excision or follow-up (>24 months). Lesion- and device-specific underestimation rates of malignancy were calculated.RESULTS: Surgical excision was performed on 237 lesions: 178 were benign, 21 atypical, 38 cancers. The remaining 63 lesions were unchanged at follow-up. Overall malignancy underestimation rate was 12.7% at 14-g CNB and 12.5% at 11-g VAB. Based on excision histology or follow-up, lesion-specific underestimation rates were: benign papillomas: 14-g CNB 11%, 11-g VAB 0%; RSL: 14-g CNB 6%, 11-g VAB 4%; LN: 14-g CNB 40%, 11-g VAB 23%; ADH: 14-g CNB 33%, 11-g VAB 22%.CONCLUSION: In the case of percutaneous diagnosis of B3 lesions, underestimation of malignancy occurs regardless of the biopsy method.

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13. 3T MRI-guided vacuum-assisted breast biopsy

Author(s): Dogan B.

Citation: American Journal of Roentgenology, May 2011, vol./is. 196/5 SUPPL.(A92), 0361-803X (May 2011)

Publication Date: May 2011

Abstract: Objective: 3-T contrast-enhanced breast MRI is increasingly being used for improved depiction of lesion morphology and faster imaging. Our aim was to test the feasibility of 3-T vacuum-assisted large bore biopsy on breast MRI detected lesions. Materials and Methods: Twenty patients underwent 3-T MRI-guided 9G vacuum-assisted biopsy of a suspicious breast lesion identified on 3-T contrast-enhanced breast MRI as part of patient care at our institution. Results were retrospectively reviewed for lesion size, needle artifact size, biopsy outcome, lesion upgrade rate, complications, and biopsy failures, and compared with those of 110 biopsies performed on 1.5-T system in a HIPAA-
compliant, Institutional Review Board-approved study. Fisher's exact test, two-sample t tests, and Wilcoxon's ranked tests were used for statistical analysis. Results: The biopsy protocol was kept the same on both the 1.5-T and the 3-T MRI-guided biopsy systems. The mean lesion size was 0.9 cm on the 3-T system, and on the 1.5-T system, the mean lesion size was 1.7 cm (p = 0.098). We did not find a significant difference between the indications for the MRI studies, rates of biopsy failures, or needle artifact measurements when the cases performed on the 3-T system were compared with the cases performed on the 1.5-T system. The distribution of the pathology types did not differ with statistical significance between the groups. The malignancy rate for the 3-T biopsies was 18% and the malignancy rate for the 1.5-T biopsies was 20% (p = 0.19, Fisher's exact test). High-risk lesion (atypical ductal hyperplasia, lobular carcinoma in situ, and atypical lobular hyperplasia) rate was 6% on the 3-T system, without any upgrades to malignancy. The high-risk lesion rate was 20% on the 1.5-T system. At surgery, 17% of these lesions were upgraded to malignancy. Biopsy complications including hematoma and pain at the biopsy site did not differ significantly between the two groups. Conclusion: Our preliminary experience reveals that 3-T MRI-guided vacuum-assisted biopsy is a safe and effective interventional method, which enables accurate biopsy of lesions identified on the 3-T system. Artifacts on the 3-T system did not result in failed biopsies.

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14. Efficacy and cost-effectiveness of stereotactic vacuum-assisted core biopsy of nonpalpable breast lesions: analysis of 602 biopsies performed over 5 years.


Citation: Radiologia Medica, April 2011, vol./is. 116/3(477-88), 0033-8362;1826-6983 (2011 Apr)

Publication Date: April 2011

Abstract: PURPOSE: The authors sought to evaluate the diagnostic accuracy and cost-effectiveness of vacuum-assisted core biopsy (VACB) in comparison with diagnostic surgical excision for characterisation of nonpalpable breast lesions classified as Breast Imaging Reporting and Data System (BI-RADS) categories R3 and R4.MATERIALS AND METHODS: From January 2004 to December 2008, we conducted 602 stereotactic, 11-gauge, VACB procedures on 243 nonpalpable breast lesions categorised as BI-RADS R3, 346 categorised as BI-RADS R4 and 13 categorised as BI-RADS R5. We calculated the diagnostic accuracy and cost savings of VACB by subtracting the cost of the stereotactic biopsy from that of the diagnostic surgical procedure.RESULTS: A total of 56% of the lesions were benign and required no further assessment. Lesions of uncertain malignant potential (B3) (23.6%) were debated at multidisciplinary meetings, and diagnostic surgical biopsy was recommended for 83.1% of them. All malignant lesions (B4 and B5) underwent surgical excision. VACB had a sensitivity of 94.9%, specificity of 98.3% and diagnostic accuracy of 97.7%. The cost savings per VACB procedure were 464.00 euro; by obviating 335 surgical biopsies, the overall cost savings was 155,440.00 euro over 5 years.CONCLUSIONS: VACB proved to have high diagnostic accuracy for characterising abnormalities at low to intermediate risk of malignancy and obviated surgical excision in about half of the cases, allowing for considerable cost savings.

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15. Vacuum-assisted biopsy diagnosis of atypical ductal hyperplasia and patient
PURPOSE: This study sought to evaluate the accuracy of vacuum-assisted biopsy (VAB) in the diagnosis of atypical ductal hyperplasia (ADH) by determining the rate of VAB underestimation compared with definitive histology. In addition, an attempt was made to identify parameters that could help determine the most appropriate patient management.

MATERIALS AND METHODS: We retrospectively reviewed 1,776 VAB procedures performed between November 1999 and January 2008 for suspicious subclinical breast lesions visible only at mammography. A total of 177 patients with a VAB diagnosis of pure ADH were studied. Patients with a diagnosis of ADH associated with other lesions (lobular intraepithelial neoplasia, papilloma), atypical lobular hyperplasia, lobular carcinoma in situ and any lesions with a microhistological diagnosis other than ADH were excluded. Mammographic appearance of lesions was as follows: 152 mostly clustered microcalcifications (86%); five opacities with microcalcifications (3%); 12 single opacities (3%); and eight parenchymal distortions (4%), of which five were without and three were with microcalcifications. In cases underestimated by VAB, we evaluated the extent of ADH within ducts and lobules. Based on results, patients were subdivided into two groups: <=2 ADH foci; >2 ADH foci. Patients were subdivided into two groups: one was referred for surgery and the other for follow-up care. The decision to either perform or not perform surgery was based on combined analysis of the following parameters: patient age; risk factors in the patient's history; mammographic extent of microcalcifications; complete excision of microcalcifications at VAB; and final Breast Imaging Reporting and Data System (BI-RADS) assessment.

RESULTS: In the first group (n=98), comparison of microhistology with final histology revealed that 19 cases of ADH had been underestimated by VAB. In the second group (n=79), six cases of ADH showed progression of the mammographic abnormality, which was subsequently confirmed by surgical biopsy.

CONCLUSIONS: The most relevant parameters affecting the decision to proceed to surgical excision were lesion diameter >7 mm on mammography, >2 ADH foci, incomplete removal of the calcifications and a family and/or personal history of breast cancer. Although there are no definite mammographic predictors of malignancy, a radiological assessment of suspicious lesion in the presence of an additional equivocal parameter always warrants surgical management.

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Author(s): Nguyen CV, Albarracin CT, Whitman GJ, Lopez A, Sneige N

Citation: Annals of Surgical Oncology, March 2011, vol./is. 18/3(752-61), 1068-9265;1534-4681 (2011 Mar)

Publication Date: March 2011

Abstract: BACKGROUND: Our goal was to analyze clinicopathologic features of patients with atypical ductal hyperplasia (ADH) diagnosed on directional vacuum-assisted biopsy (DVAB) targeting microcalcifications to identify factors predicting the presence of carcinoma.

MATERIALS AND METHODS: We retrospectively evaluated the clinical, mammographic, and histologic features of 140 patients with DVAB-diagnosed ADH who underwent either segmental excision (86.4%) or mammographic follow-up (>=2 years; 13.6%). Cases with mass lesions or ipsilateral cancer were excluded.

RESULTS: In 16 cases, carcinoma was found on excision. All cases without excision showed no new abnormalities on mammographic follow-up. Only the amount of calcifications removed (<=95%) significantly correlated with the rate of upgrade of ADH to carcinoma ([NON-BREAKING SPACE]=([NON-BREAKING SPACE]0.037). Significant histologic predictors of upgrade to carcinoma included number of terminal duct-lobular
units (TDLU; >2) involved (P[NON-BREAKING SPACE]=N[ON-BREAKING SPACE].0306), presence of significant cytologic atypia suspicious for intermediate or high-grade carcinoma (P[NON-BREAKING SPACE]<N[ON-BREAKING SPACE].0001), and necrosis (P[NON-BREAKING SPACE]=N[ON-BREAKING SPACE].0006). Among ADH cases without significant atypia and/or necrosis, the extent of ADH (<2 vs. >2 TDLU involved) was not a significant predictor of carcinoma (P[NON-BREAKING SPACE]=N[ON-BREAKING SPACE].0000). CONCLUSIONS: ADH associated with calcifications in the absence of a mass lesion can be categorized into different risk groups using a multidisciplinary approach with correlation of histologic and mammographic findings. ADH lesions with significant cytologic atypia and/or necrosis are most likely to be associated with carcinoma and should be excised. ADH without these features, regardless of extent of involvement, and with >95% removal of the targeted calcifications, is associated with a minimal risk (<3%) of carcinoma and may undergo mammographic follow-up only.

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17. High-risk lesions diagnosed at MRI-guided vacuum-assisted breast biopsy: can underestimation be predicted?

Author(s): Crystal P, Sadaf A, Bukhanov K, McCready D, O'Malley F, Helbich TH

Citation: European Radiology, March 2011, vol./is. 21/3(582-9), 0938-7994;1432-1084 (2011 Mar)

Publication Date: March 2011

Abstract: OBJECTIVES: To evaluate the frequency of diagnosis of high-risk lesions at MRI-guided vacuum-assisted breast biopsy (MRgVABB) and to determine whether underestimation may be predicted. METHODS: Retrospective review of the medical records of 161 patients who underwent MRgVABB was performed. The underestimation rate was defined as an upgrade of a high-risk lesion at MRgVABB to malignancy at surgery. Clinical data, MRI features of the biopsied lesions, and histological diagnosis of cases with and those without underestimation were compared. RESULTS: Of 161 MRgVABB, histology revealed 31 (19%) high-risk lesions. Of 26 excised high-risk lesions, 13 (50%) were upgraded to malignancy. The underestimation rates of lobular neoplasia, atypical apocrine metaplasia, atypical ductal hyperplasia, and flat epithelial atypia were 50% (4/8), 100% (5/5), 50% (3/6) and 50% (1/2) respectively. There was no underestimation in the cases of benign papilloma without atypia (0/3), and radial scar (0/2). No statistically significant differences (p[THIN SPACE]=1[THIN SPACE]0.1) between the cases with and those without underestimation were seen in patient age, indications for breast MRI, size of lesion on MRI, morphological and kinetic features of biopsied lesions. CONCLUSIONS: Imaging and clinical features cannot be used reliably to predict underestimation at MRgVABB. All high-risk lesions diagnosed at MRgVABB require surgical excision.

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18. The current role of vacuum assisted breast biopsy system in breast disease.

Author(s): Park HL, Kim LS

Citation: Journal of Breast Cancer, March 2011, vol./is. 14/1(1-7), 1738-6756;2092-9900 (2011 Mar)

Publication Date: March 2011

Abstract: The gold standard for breast biopsy procedures is currently an open excision of the suspected lesion. However, an excisional biopsy inevitably makes a scar. The cost and morbidity associated with this procedure has prompted many physicians to evaluate less invasive, alternative procedures. More recently, image-guided percutaneous core-needle
biopsy has become a frequently used method for diagnosing palpable and non-palpable breast lesions. Although sensitivity rates for core-needle biopsy are high, it has the disadvantage of histological underestimation, which renders the management of atypical ductal hyperplasia, papillary lesions, and fibroepithelial lesions somewhat difficult. Vacuum assisted breast biopsy (VABB) was developed to overcome some of these negative aspects of core-needle biopsy. VABB allows for a sufficient specimen to be obtained with a single insertion and can provide a more accurate diagnosis and completely remove the lesion under real-time ultrasonic guidance. The advantage of complete lesion removal with VABB is to reduce or eliminate sampling error, to decrease the likelihood of a histological underestimation, to decrease imaging-histological discordance, to decrease the re-biopsy rate, and to diminish the likelihood of subsequent growth on follow-up. In recent years, with the advancement of VABB instruments and techniques, many outcome studies have reported on the use of VABB for resecting benign breast lesions with a curative intent. VABB is highly accurate for diagnosing suspicious breast lesions and is highly successful at treating presumed benign breast lesions. Thus, in the near future, VABB will be routinely offered to all appropriately selected patients.

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19. The current role of vacuum assisted breast biopsy system in breast disease
Author(s): Park H.-L., Kim L.S.
Citation: Journal of Breast Cancer, March 2011, vol./is. 14/1(1-7), 1738-6756 (March 2011)
Publication Date: March 2011
Abstract: The gold standard for breast biopsy procedures is currently an open excision of the suspected lesion. However, an excisional biopsy inevitably makes a scar. The cost and morbidity associated with this procedure has prompted many physicians to evaluate less invasive, alternative procedures. More recently, image-guided percutaneous core-needle biopsy has become a frequently used method for diagnosing palpable and non-palpable breast lesions. Although sensitivity rates for core-needle biopsy are high, it has the disadvantage of histological underestimation, which renders the management of atypical ductal hyperplasia, papillary lesions, and fibroepithelial lesions somewhat difficult. Vacuum assisted breast biopsy (VABB) was developed to overcome some of these negative aspects of core-needle biopsy. VABB allows for a sufficient specimen to be obtained with a single insertion and can provide a more accurate diagnosis and completely remove the lesion under real-time ultrasonic guidance. The advantage of complete lesion removal with VABB is to reduce or eliminate sampling error, to decrease the likelihood of a histological underestimation, to decrease imaging-histological discordance, to decrease the re-biopsy rate, and to diminish the likelihood of subsequent growth on follow-up. In recent years, with the advancement of VABB instruments and techniques, many outcome studies have reported on the use of VABB for resecting benign breast lesions with a curative intent. VABB is highly accurate for diagnosing suspicious breast lesions and is highly successful at treating presumed benign breast lesions. Thus, in the near future, VABB will be routinely offered to all appropriately selected patients. 2011 Korean Breast Cancer Society.

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20. Atypical ductal hyperplasia on vacuum-assisted breast biopsy: suspicion for ductal carcinoma in situ can stratify patients at high risk for upgrade.
Author(s): Allison KH, Eby PR, Kohr J, DeMartini WB, Lehman CD
Citation: Human Pathology, January 2011, vol./is. 42/1(41-50), 0046-8177;1532-8392 (2011 Jan)
Publication Date: January 2011
Abstract: We evaluated 97 cases of review-confirmed atypical ductal hyperplasia found on stereotactic vacuum-assisted breast biopsy of suspicious calcifications. The number and size of foci of atypical ductal hyperplasia and presence of a micropapillary component were noted. In addition, we recorded if a case was considered "atypical ductal hyperplasia suspicious for ductal carcinoma in situ" using specific qualitative criteria. The upgrade rate was 20.6% (20/97) for all cases and 48% (12/25) for cases suspicious for ductal carcinoma in situ. Suspicion for ductal carcinoma in situ was found to be a strong predictor of upgrade with an odds ratio of 7.4 (P = .0003). Suspicious cases with nuclear features bordering on intermediate nuclear grade had the highest upgrade rate of 75% (6/8). Cases with >= 3 foci had significantly higher upgrade rates (28%) than those with less than 3 foci (11%), but focal atypical ductal hyperplasia did upgrade (P = .04). In conclusion, qualitative features of atypical ductal hyperplasia on core biopsy such as suspicion for ductal carcinoma in situ may help stratify patients at the highest risk for upgrade. Copyright Copyright 2011 Elsevier Inc. All rights reserved.

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21. B3 breast lesions determined by vacuum-assisted biopsy: how to reduce the frequency of benign excision biopsies.

Author(s): Tonegutti M, Girardi V, Ciatto S, Manfrin E, Bonetti F

Citation: Radiologia Medica, December 2010, vol./is. 115/8(1246-57), 0033-8362;1826-6983 (2010 Dec)

Publication Date: December 2010

Abstract: PURPOSE: The aim of this study was to identify parameters allowing differentiation among the diverse group of B3 lesion at stereotactic vacuum-assisted biopsy (VAB) to identify patients with a low risk of cancer and who can therefore be referred for follow-up rather than surgery and thus reduce the number of unnecessary surgical procedures.MATERIALS AND METHODS: Among 608 VAB procedures performed for nonpalpable ultrasound (US)-occult mammographic abnormality, 102 cases of B3 were included in this study. Mammographic lesion type, lesion size, Breast Imaging Reporting and Data System (BIRADS) category, number of specimens per lesion and presence of atypia were retrospectively analysed. Results were compared with histological findings at surgery (53 cases) or mammographic findings during follow-up (49 cases). Statistical analysis was performed with univariate analysis (chi-square test), and statistical significance was set at p<0.05.RESULTS: The majority of cases were depicted as isolated microcalcifications (82.3%), were smaller than 10 mm (80.4%), had a low level of radiological suspicion (64.7%) and had 11 or more cores sampled (94.1%). Atypia at VAB was reported in 60 of 102 cases (58.8%). Carcinoma was found at excision in 5/60 (8%) B3 lesions with atypia and in no B3 lesions without atypia (p=0.146). Cancer at surgery was more frequent among cases of isolated microcalcifications (p=0.645), cases with high radiological suspicion (p=0.040) and those with a smaller number of cores sampled (borderline significant p=0.064).CONCLUSIONS: On the basis of our experience, the presence or absence of atypia in our series proved to be the reliable criterion to prompt or avoid surgery in cases with a VAB finding of B3 lesion. This criterion may therefore be adopted in practice to more accurately select patients for surgery.

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22. Breast lesions with ultrasound imaging-histologic discordance at 16-gauge core needle biopsy: can re-biopsy with 10-gauge vacuum-assisted system get definitive diagnosis?.

Author(s): Li JL, Wang ZL, Su L, Liu XJ, Tang J

Citation: Breast, December 2010, vol./is. 19/6(446-9), 0960-9776;1532-3080 (2010 Dec)
Abstract: The aim of this study was to evaluate if re-biopsy with 10-gauge vacuum-assisted biopsy (VAB) could get definitive diagnosis for breast lesions with ultrasound (US) imaging-histologic discordance at 16-gauge core needle biopsy (CNB). From January 2007 to June 2008, a consecutive biopsy was performed on 1069 lesions with US-guided 16-gauge CNB. A total of 28 lesions were considered to be US imaging-histologic discordant and all of them underwent subsequent 10-gauge VAB. All malignant lesions located at VAB were treated with subsequent surgery and all benign lesions at VAB were followed up for at least 1 year. Six of the 28 lesions (21.4%) had pathologic upgrade after VAB. In them, one case upgraded from adenosis to ductal carcinoma in situ (DCIS); one case upgraded from adenosis to infiltrating ductal carcinoma (IDC); one case upgraded from atypical ductal hyperplasia to IDC; two cases upgraded from intraductal papilloma to DCIS; and one case upgraded from sclerosing adenosis to invasive lobular carcinoma (ILC). The subsequent surgery further demonstrated the diagnosis of VAB for all the lesions with histologic upgrade. Re-biopsy could improve diagnostic accuracy in patients with breast lesions showing imaging-histologic discordance during CNB, and 10-gauge VAB was a valuable method to deal with re-biopsy. Copyright Copyright 2010 Elsevier Ltd. All rights reserved.

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23. Stereotactic vacuum-assisted breast biopsy is not a therapeutic procedure even when all mammographically found calcifications are removed: Analysis of 4,086 procedures

Author(s): Penco S., Rizzo S., Bozzini A.C., Latronico A., Menna S., Cassano E., Bellomi M.

Citation: American Journal of Roentgenology, November 2010, vol./is. 195/5(1255-1260), 0361-803X;15(46-3141 (November 2010)

Publication Date: November 2010

Abstract: OBJECTIVE. The purpose of our study was to assess whether in case of total removal of microcalcifications there is still residual tumor on the surgical specimen and, secondarily, to assess whether complete rather than partial excision of the imaging target with microcalcifications may result in increased diagnostic accuracy. MATERIALS AND METHODS. We retrospectively reviewed 4,086 stereotactic vacuum-assisted breast biopsy (VABB) procedures for microcalcifications and histologic findings to determine the frequency of malignancy, histologic underestimation, and complete removal of cancer. RESULTS. No residual microcalcifications on postbiopsy mammograms were seen in 1,594 of 4,047 (39.4%) procedures successfully completed: 351 of 1,594 lesions were malignant, 1,109 benign and 134 atypical. After partial removal of microcalcifications at VABB, the postsurgical specimen had infiltrating carcinoma in 130 of 566 cases (23%), whereas in case of total removal of microcalcifications, the underestimation occurred in 13 of 234 (5.5%) cases. The atypical ductal hyperplasia underestimation rate was 6.6% when the mammography target was completely removed and 38.7% when the target was only sampled. The percentage of lobular carcinoma in situ underestimation was the same for the two groups with partial and total removal of microcalcifications (21.2%). Among 1,016 VABB procedures with pathologic result of malignancy, 882 (86.6%) had residual cancer at surgery. In the group with complete removal of microcalcifications at VABB, residual cancer was found in 70% of cases. CONCLUSION. VABB may not be considered a therapeutic procedure, even in the case of complete removal of microcalcifications. However, a complete removal of microcalcifications may result in low rates of underestimation of malignancy and may consequently increase the diagnostic accuracy of the diagnostic procedure. American Roentgen Ray Society.

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24. Vacuum-assisted core biopsy of B3 lesions showing atypia on needle core biopsy: A worthwhile exercise?

Author(s): Al-Attar M., Tennant S., Denton E., Khan H., Grosvenor L., Lister D.

Citation: Breast Cancer Research, October 2010, vol./is. 12/(S10), 1465-5411 (25 Oct 2010)

Publication Date: October 2010

Abstract: Introduction There has been increasing interest in the use of vacuum-assisted core biopsy (VACB) over the past two decades. There remains some uncertainty about its role in the presence of cytological or architectural atypia on needle core biopsy (NCB). We have recently been offering VACB for selected B3 cases with atypia. MDT discussion, where technical suitability and potential value of VACB is debated, is used to select appropriate cases. Methods A retrospective case review of all B3 lesions diagnosed at NCB between 1 March 2008 and 1 March 2010. Results A total of 166 B3 lesions were diagnosed: 123 underwent surgical biopsy, of which 30 were malignant (eight invasive, 22 non invasive), 10 had LCIS and 83 were benign. Forty-three B3 lesions underwent VACB: 18/43 lesions had shown atypia at NCB and following VACB, seven were upgraded to DCIS, three were downgraded to B2, six remained as B3 with atypia (5/6 had surgery - three malignant, two benign). VACB failed in two cases. Twenty-five out of 43 cases had shown no atypia at NCB. One out of 25 was upgraded to B4 on VACB, but no malignancy was seen at surgery. Twenty-four out of 25 cases were downgraded to B2. Conclusions Our results show a potential benefit of this technique in selected cases. We were able to upgrade 39% of B3 lesions with atypia, thereby allowing immediate definitive surgery. We were able to avoid surgical excision in 3/18 (17%) of B3 lesions with atypia.

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25. Does a second image-guided biopsy contribute to the management of B3 lesions?

Author(s): Juttla J.K., Teh W.

Citation: Breast Cancer Research, October 2010, vol./is. 12/(S9), 1465-5411 (25 Oct 2010)

Publication Date: October 2010

Abstract: Introduction B3 (benign with uncertain malignant potential) lesions such as atypias and papillary lesions have final surgical outcome of malignancy in about 20% of vacuum-assisted and 45% of image-guided core biopsies. We examine the benefits of undertaking a second image-guided biopsy in these cases. Methods A retrospective study of all B3 lesions diagnosed between January 2008 and December 2009 at the North London Breast Screening Service. Results Out of 235 biopsies in 167 women over a 2-year period, there were 191 B3 outcomes of which 59 had a final malignant outcome (30.8%). Following MDT discussion, 60/191 B3 lesions were subjected to a second biopsy (25.5%) and one lesion a third biopsy. These yielded a malignant diagnosis in 11 (18.3%) cases. Lesions successfully upgraded to malignancy included three micro calcification (MCC), three masses, three masses with MCC and one cyst with solid elements. Cancers diagnosed on second biopsies were one invasive ductal, one invasive papillary carcinoma and nine ductal carcinoma in situ (DCIS). All second biopsies were performed using a vacuum device with the initial biopsy method being 14G core biopsy in eight cases and vacuum-assisted in three cases. Second biopsies were therefore equally useful in upgrading MCC and masses and especially useful for DCIS. Conclusions Second-time image-guided biopsies can successfully yield a definitive malignant diagnosis in B3 lesions.
(18.3%) and thus enable therapeutic rather than diagnostic surgery to be undertaken. Second biopsies are equally useful in the management of MCC, masses and masses with MCC.

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Author(s): Ouldamer L, Body G, Arbion F, Avigdor S, Michenet P

Citation: Gynecologie, Obstetrique & Fertilite, July 2010, vol./is. 38/7-8(455-9), 1297-9589;1769-6682 (2010 Jul-Aug)

Publication Date: July 2010

Abstract: OBJECTIVES: Clinical and pathological features of mucocele-like lesions in the breast are well-known though rare. The aim of this study is to evaluate the frequency of other breast proliferations association, the underestimation with ultrasound guided core biopsy or stereotactic vacuum-assisted biopsy and its implication on patient's management.PATIENTS AND METHODS: Retrospective study conducted in the gynecology departments of Tours and Orleans between January 1997 and December 2007, reviewing the records of all patients with diagnosis of mammary mucocele-like lesion on core or stereotactic biopsy.RESULTS: Eight cases were identified, all screen-detected (mammographic abnormalities) on asymptomatic women. For the five cases diagnosed by core biopsy, initial histological examination found isolated mucocele-like lesions in four cases, and association with atypical ductal hyperplasia in the other case. Vacuum-assisted biopsy and/or surgical excision were always done finding an association with mucinous carcinoma and another case of association with atypical ductal hyperplasia. For cases diagnosed by vacuum-assisted biopsy, histological examination was almost similar to the surgical one.DISCUSSION AND CONCLUSION: High rate of associated lesions (especially atypical ductal hyperplasia) makes necessary the advice of complementary surgical excision after a diagnosis of a mucocele-like lesion on a biopsy specimen. Vacuum-assisted biopsies could have their place as a curative method in certain conditions. Copyright 2010 Elsevier Masson SAS. All rights reserved.

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27. Risk of upgrade of atypical ductal hyperplasia after stereotactic breast biopsy: effects of number of foci and complete removal of calcifications.

Author(s): Kohr JR, Eby PR, Allison KH, DeMartini WB, Gutierrez RL, Peacock S, Lehman CD

Citation: Radiology, June 2010, vol./is. 255/3(723-30), 0033-8419;1527-1315 (2010 Jun)

Publication Date: June 2010

Abstract: PURPOSE: To determine if patients with fewer than three foci of atypical ductal hyperplasia (ADH) who have all of their calcifications removed after stereotactic 9- or 11-gauge vacuum-assisted breast biopsy (VABB) have a rate of upgrade to malignancy that is sufficiently low to obviate surgical excision.MATERIALS AND METHODS: An institutional review board-approved, HIPAA-compliant retrospective review of 991 cases of consecutive 9- or 11-gauge stereotactic VABB performed during a 65-month period revealed 147 cases of atypia. One pathologist performed a blinded review of the results of procedures performed to assess for calcifications and confirmed ADH in 101 cases with subsequent surgical excision. Each large duct or terminal duct-lobular unit containing ADH was
considered a focus and counted. Postbiopsy mammograms were reviewed to determine whether all calcifications were removed. Upgrade to malignancy was determined from excisional biopsy pathology reports. Upgrade rates as a function of both number of foci and presence or absence of residual calcifications were calculated and compared by using chi(2) tests. RESULTS: Upgrade to malignancy occurred in 20 (19.8%) of the 101 cases. The upgrade rate was significantly higher in cases of three or more foci of ADH (15 [28%] of 53 cases) than in cases of fewer than three foci (five [10%] of 48 cases) (P = .02). Upgrade rates were similar, regardless of whether all mammographic calcifications were removed (seven [17%] of 41 cases) or all were not removed (nine [20%] of 45 cases) (P = .77). Upgrade occurred in two (12%) of 17 cases in which there were fewer than three ADH foci and all calcifications were removed. CONCLUSION: The upgrade rate is significantly higher when ADH involves at least three foci. Surgical excision is recommended even when ADH involves fewer than three foci and all mammographic calcifications have been removed, because the upgrade rate is 12%. Copyright RSNA, 2010

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28. [Vacuum-assisted biopsy and wire localization for the diagnosis of non-palpable breast lesions].

Author(s): Su KL, Xu HB, Hu ZJ, He JL, Yang OO, Hu WH

Citation: Chung-Hua Chung Liu Tsa Chihs [Chinese Journal of Oncology], June 2010, vol./is. 32/6(472-5), 0253-3766;0253-3766 (2010 Jun)

Publication Date: June 2010

Abstract: OBJECTIVE: To compare the effectiveness and accuracy of the use of vacuum-assisted biopsy (VAB) versus wire localization (WL) in the diagnosis of non-palpable breast lesions (NPBL).METHODS: Ninety-seven consecutive women with NPBL were randomized into VAB group and WL group. All specimens were identified by mammography. The patients were requested to score the cosmetic appearance of their breast after operation, and a numerical rating scale was used to measure pain on the first postoperative day. Underestimation rates for atypical ductal hyperplasia (ADH) and ductal carcinoma in situ (DCIS) were recorded if open surgical biopsy revealed DCIS and invasive cancer, respectively. Clear margins were also recorded in the two groups.RESULTS: VAB and WL located all the NPBL successfully. In the VAB group, the specimen volume was smaller than that of the WL group (2.3 cm(3) vs. 18.4 cm(3), P = 0.03). Underestimation rates of ADH and DCIS in the VAB group were 16.7% and 11.1%, respectively. The diagnostic accordance rate of VAB was 97.9%, the false negative rate was 2.1%, and there was no false positive case. The means of the numerical rating pain scale were different in both groups (1.7 for VAB vs. 2.5 for WL, P = 0.02). When cosmetic results were taken into account, 40 VAB patients had excellent outcomes and 8 good outcomes, compared with 25 excellent and 24 good for the WL group. There were better cosmetic outcomes with the VAB procedure (P < 0.05).CONCLUSION: VAB is highly reliable and may avoid diagnostic open surgery in the majority of patients with benign lesions. However, because of the underestimation of histologic diagnosis and tumor margin involvement, VAB can not be used to completely substitute wire localization.

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29. Surgical excision for B3 breast lesions diagnosed by vacuum-assisted core biopsy.

Author(s): Reefy S, Osman H, Chao C, Perry N, Mokbel K

Citation: Anticancer Research, June 2010, vol./is. 30/6(2287-90), 0250-7005;1791-7530 (2010 Jun)
Publication Date: June 2010

Abstract: UNLABELLED: The aim of this retrospective study was to assess whether open surgical excision is required following a B3 diagnosis on 11-gauge vacuum-assisted core biopsy (VACB) of radiologically indeterminate breast lesions. PATIENTS AND METHODS: Twenty-four women with a histological diagnosis of the B3 category on VACB of radiologically indeterminate breast lesions were identified over a 3-year period. The VACB procedure was performed under stereotactic (n=21), ultrasound (n=2) or magnetic resonance imaging (MRI) (n=1) guidance using the Suros system. Nineteen patients underwent open surgical excision. The remaining 5 patients who had 'complete' removal of the radiological abnormality using VACB under ultrasound (n=2, papilloma) or stereotactic (n=4, atypical ductal hyperplasia) guidance were followed up clinically and radiologically. RESULTS: The median patient age was 49 years. The disease status in three patients was upgraded to ductal carcinoma in situ at open surgical excision. The VACB showed atypical lobular hyperplasia in these 3 patients, associated with microcalcification (n=2) or mass lesion (n=1). No single case of upgrading to invasive breast cancer was identified in our series. The remaining patients (16 out of 19) had a benign biopsy. The upgrade to malignancy was significantly associated with the presence of atypical lobular hyperplasia, a BI-RADS category of 4 and incomplete removal of the radiological abnormality by VACB. After a mean follow-up of 18 months, no malignancy was detected in the 5 patients who did not undergo open surgical biopsy. CONCLUSION: Open surgical excision is strongly recommended for atypical lobular hyperplasia identified in VACB specimens. VACB can be a safe alternative to surgery in the treatment of B3 lesions in selected cases, providing thorough multidisciplinary discussion has taken place.

Source: MEDLINE

Full Text: Available in fulltext at ULHT journal article requests. Complete the online form to obtain articles.

30. Diagnostic value of vacuum-assisted breast biopsy for breast carcinoma: a meta-analysis and systematic review.

Author(s): Yu YH, Liang C, Yuan XZ

Citation: Breast Cancer Research & Treatment, April 2010, vol./is. 120/2(469-79), 0167-6806;1573-7217 (2010 Apr)

Publication Date: April 2010

Abstract: As mammography screening has its limitation in diagnosis in breast carcinoma, minimally invasive procedures offer a better option. We conducted a systematic review to establish the overall value of Vacuum-assisted breast biopsy (VAB) for the diagnosis of breast cancer. After a review and quality assessment of 21 studies, sensitivity, specificity and other measures of accuracy of VAB for evaluating breast lesions were pooled using random-effects models. Summary receiver operating characteristic curves were used to summarize overall accuracy. Underestimate rate of atypical ductal hyperplasia (ADH) and ductal carcinoma in situ (DCIS) were also calculated. The summary estimates for VAB in diagnosis of breast carcinoma were as follows: sensitivity, 0.981 (95% confidence interval [CI], 0.972-0.987); specificity, 0.999 (95% CI, 0.997-0.999); positive likelihood ratio (PLR), 93.84 (95% CI, 41.55-211.95); negative likelihood ratio, 0.05 (95% CI, 0.03-0.09); diagnostic odds ratio, 1891.7 (95% CI, 683.8-5233.4); underestimate rate of ADH and DCIS were 20.9% (95% CI, 0.177-0.245) and 11.2% (95% CI, 0.098-0.128), respectively. VAB is a highly sensitive and specific biopsy method for evaluating mammographically detected breast in women. To be on the safe side, the diagnosis of ADH in VAB warrants surgical excision.

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31. Diagnostic value of vacuum-assisted breast biopsy for breast carcinoma: A
**meta-analysis and systematic review**

**Author(s):** Yu Y.-H., Liang C., Yuan X.-Z.

**Citation:** Breast Cancer Research and Treatment, April 2010, vol./is. 120/2(469-479), 0167-6806;1573-7217 (April 2010)

**Publication Date:** April 2010

**Abstract:** As mammography screening has its limitation in diagnosis in breast carcinoma, minimally invasive procedures offer a better option. We conducted a systematic review to establish the overall value of Vacuum-assisted breast biopsy (VAB) for the diagnosis of breast cancer. After a review and quality assessment of 21 studies, sensitivity, specificity and other measures of accuracy of VAB for evaluating breast lesions were pooled using randomeffects models. Summary receiver operating characteristic curves were used to summarize overall accuracy. Underestimate rate of atypical ductal hyperplasia (ADH) and ductal carcinoma in situ (DCIS) were also calculated. The summary estimates for VAB in diagnosis of breast carcinoma were as follows: sensitivity, 0.981 (95% confidence interval [CI], 0.972-0.987); specificity, 0.999 (95% CI, 0.997-0.999); positive likelihood ratio (PLR), 93.84 (95% CI, 41.55-211.95); negative likelihood ratio, 0.05 (95% CI, 0.03-0.09); diagnostic odds ratio, 1891.7 (95% CI, 683.85233.4); underestimate rate of ADH and DCIS were 20.9% (95% CI, 0.177-0.245) and 11.2% (95% CI, 0.098-0.128), respectively. VAB is a highly sensitive and specific biopsy method for evaluating mammographically detected breast in women. To be on the safe side, the diagnosis of ADH in VAB warrants surgical excision.

**Source:** EMBASE

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**32. Magnetic Resonance Imaging (MRI)-guided breast biopsy: Experience at a community comprehensive breast center with MRI-guided breast biopsy capability**

**Author(s):** Larsen A.R., Lago-Toro C.E., Barrio A.V., Stassi J., Frazier T.G.

**Citation:** Annals of Surgical Oncology, April 2010, vol./is. 17/(S180), 1068-9265 (April 2010)

**Publication Date:** April 2010

**Abstract:** Objectives: Magnetic resonance imaging (MRI) of the breast is a highly sensitive imaging modality used in diagnosing breast cancer. BI-RADS category 4 or 5 lesions detected on MRI that are not visible on ultrasound or mammogram require biopsy with MRI direction. The objective of our study was to evaluate MRI-guided, vacuum-assisted needle biopsy at a comprehensive breast center staffed by radiologists subspecializing in breast imaging. Methods: An institutional review board (IRB)-approved retrospective chart review of MRI-guided breast biopsies at our comprehensive breast center between June 2005 and June 2009 was performed. Abnormalities detected on MRI for which biopsy was recommended subsequently underwent targeted ultrasound. In cases where the abnormality could be located on ultrasound, ultrasound-guided biopsy was performed. Abnormalities visible only on MRI were scheduled for MRI-guided biopsy with a 9-gauge, vacuum-assisted biopsy device. Follow-up MRI was performed on all patients 6 months after biopsy. Results: Two hundred twenty-nine MRI-guided breast biopsies of BI-RADS category 4 or 5 lesions not visible on targeted ultrasound were scheduled in 198 patients. Of those 229, 168 (73%) had their initial MRI performed at our facility and 61 (27%) were performed at outside facilities. Fifty-five (90%) of 61 cases were performed at facilities lacking MRI-guided biopsy capability. In 31/229 (14%) cases, lesions were not visualized on second MRI. Nineteen (61%) of 31 of those had their initial MRI performed at an outside facility resulting in a cancellation rate of 31% (19/61). The remaining 12/31(39%) had their initial MRI at our comprehensive breast center, yielding a cancellation rate of 7% (12/168). One hundred ninety-eight (86%) of 229 biopsies were performed. Fifty-six (28%) of 198 demonstrated either malignancy or high-risk lesions. Thirty-three (59%) of 56 demonstrated malignancy. Invasive malignancy was found in 24/33 (73%) and ductal carcinoma in situ (DCIS) in 9/33 (27%). Twenty-three (41%) of 56 were high-risk lesions.
lesions, 11/23 (48%) were atypical ductal hyperplasia, 3/23 (13%) atypical lobular hyperplasia, 5/23 (22%) lobular carcinoma in situ, and 4/23 (17%) papilloma. Conclusions: MRI-visualized BI-RADS category 4 or 5 lesions not seen with other imaging modalities require MRI-guided biopsy for diagnosis. A significant percentage of such lesions, 28% in our study, are malignant or high risk. Patients who have MRIs performed at facilities lacking biopsy capability are more likely to have subsequent unnecessary MRIs and to be scheduled for unneeded biopsies. Breast MRIs should ideally be performed by individuals with special training in breast imaging and biopsy at a facility with MRI-guided breast biopsy capability.

Source: EMBASE

Full Text:
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33. Prevalence of hyperplastic tissue changes in breast biopsy specimen obtained from MR-guided vacuum biopsy

Author(s): Kowal A., Roth B., Schrading S., Kuhl C.K., Schild H.

Citation: European Journal of Cancer, Supplement, March 2010, vol./is. 8/3(233), 1359-6349 (March 2010)

Publication Date: March 2010

Abstract: Background: Increased contrast uptake on breast MR imaging can serve as biomarker for epithelial proliferation. Epithelial proliferation, in turn, may be used as a marker for increased risk of subsequent breast cancer. Aim was to investigate the prevalence of hyperplastic tissue changes in breast biopsy specimen obtained from MR guided vacuum biopsy. Material and Methods: Between 07-2008 and 10-2009, 175 MR guided vacuum biopsies were performed in 143 women for contrast enhancing lesions seen in breast MRI alone (i.e. without correlate in mammography or second look ultrasound). We investigated the prevalence of proliferative tissue lesions (severe usual or atypical hyperplasia, lobular hyperplasia, LCIS, papillomatosis, flat epithelial hyperplasia, complex sclerosing lesion, or lesions requiring immunehistochemical staining to rule out malignant degeneration) versus non-proliferative tissue changes. Results: Of 175 cases, 122 proved to be benign. Among the benign lesions, a total 57 proved proliferative. This corresponds to a prevalence of proliferative changes of 47% (57/122). Conclusion: Among women undergoing MR guided vacuum biopsy for benign tissue changes, a high fraction exhibits proliferative tissue changes. Further studies are needed to investigate whether these proliferative changes (and, thus, breast MR imaging findings) can be used to identify women at increased risk for breast cancer.

Source: EMBASE

Full Text:
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34. Safety and accuracy of MR-guided vacuum biopsy of breast lesions visible by breast MRI alone

Author(s): Roth B., Schrading S., Kowal A., Kuhl C.

Citation: European Journal of Cancer, Supplement, March 2010, vol./is. 8/3(229), 1359-6349 (March 2010)

Publication Date: March 2010

Abstract: Background: To investigate the diagnostic accuracy and safety of MR-guided vacuum biopsy in routine clinical practice. Material and Methods: Over a 3-year-period (07-2006 through 07-2009) MR-guided vacuum assisted biopsy (VAB) was performed according to a standardized clinical protocol. The interventions were done on a 1.5 T closed bore magnet using an ATEC-system (Suros) with 9G needles. Validation of VAB results of each lesion was obtained by a careful radiological-pathological correlation; in addition, VAB histology results categorized as B3-5 underwent subsequent surgical resection, and VAB results categorized as B2 underwent follow-up MRI after 6 months. In cases of uncertain radiological-pathological concordance control MRI was done within one
week after VAB. All patients were followed clinically to document local complications. Results: 491 MR-guided vacuum biopsies were performed in 321 patients, with 170 women undergoing VAB of more than one target lesion unilaterally or bilaterally within one session. Age range of patients was 30-77 years (mean 53 +/- 11). VAB histology was malignant in 185/491 (38%) cases: 55/185 invasive cancers (29.7%), 93/185 pure DCIS (50.3%), 33/185 both invasive cancer and DCIS (17.8%) and 4/185 LCIS (2.2%). In 307/491 cases (62%) benign changes were found including radial scar and ADH. Average size of target lesion was 10.4mm with a minimal size of 3mm. Over the entire study no false-negative VAB results were observed, i.e. no malignant lesion identified at follow up after benign VAB. In patients undergoing surgical biopsy or treatment after MR-guided VAB, the final surgical pathology result was concordant with the VAB histology in all cases. One patient (0.3%) developed a hematoma requiring surgical evacuation, no other serious adverse events were observed. Conclusions: MR-guided VAB is an extremely accurate and safe method to biopsy even very small breast lesions visible by MRI alone. The accuracy and reliability of target tissue sampling offered by MR-guided VAB appears to be higher than that achieved by MR-guided needle localization and surgical biopsy. Accordingly, MR-guided VAB can safely replace open biopsy, thereby avoiding unnecessary surgery. This is especially important for women in BIRADS 6 situation, who require histological verification of additional lesions identified at pre-operative MRI.

Source: EMBASE

Full Text:

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35. Analysis of atypical hyperplasia and carcinoma in situ in nonpalpable breast lesions: Final outcome and underestimation rates

Author(s): Hamy A.S., Giacchetti S., Bourstyn E., Cahen-Doidy L., Cuvier C., De Bazelaire C., Bonfils S., Albiter M., De Roquancourt A., Espie M.

Citation: European Journal of Cancer, Supplement, March 2010, vol./is. 8/3(228), 1359-6349 (March 2010)

Publication Date: March 2010

Abstract: Background: The diagnosis of high risk and preinvasive lesions increases with breast cancer screening. Their significance and management is related to the type of biopsy sampling. We reviewed all consecutive high risk and in situ lesions diagnosed in a prospective cohort. Material and Methods: From 2001 to 2007, 2708 nonpalpable breast lesions BI-RADS 3 to 5 were prospectively reviewed by a multidisciplinary staff in a breast disease unit (Saint Louis Hospital, Paris) and were reclassified according to the BI-RADS categories. On the 2708 lesions, 309 core needle biopsies, 807 vacuum assisted biopsies, and 521 open breast biopsies were performed. The median follow up was 36.9 months. Results: A total of 371 high risk and in situ lesions was diagnosed (13.7%). Biopsy showed atypical ductal hyperplasia (ADH) in 78 cases, atypical lobular hyperplasia (ALH) in 50 cases, lobular carcinoma in situ (LCIS) in 24 cases, and ductal carcinoma in situ (DCIS) in 219 cases. In 78 ADH lesions, surgery was performed in 67 cases (86%), and carcinoma was diagnosed in 10 cases (12.8%). In 50 ALH lesions, surgery was performed in 39 cases (78%); seven carcinomas were diagnosed (14%). All 24 lesions yielding LCIS were excised, one single lesion was upgraded to lobular infiltrating carcinoma (4.2%). On 219 biopsies yielding DCIS, surgery performed in 211 (97%) revealed malignant invasive lesions in 34 cases (15.5%). We performed an analysis excluding high risk or in situ lesions diagnosed on open breast biopsy, as their significance differs compared to when diagnosis is made on a core needle or a vacuum assisted biopsy. For ADH and ALH, the underestimation rate of malignancy was 22% and 18.8% respectively, and for LCIS and DCIS, the underestimation rate of invasive disease was 8.3% and 25.2% respectively. Conclusion: Both atypical hyperplasia and in situ carcinoma are associated with an underestimation of malignancy. Future research needs to focus on accurately identifying clinical, radiologic, and histologic predictors of invasion in patients with DCIS diagnosed on biopsy, and select the most appropriate candidates for sentinel lymph node biopsy in front of high risk or in situ lesions.

Source: EMBASE
36. Radiological diagnosis of precursor and pre-invasive breast lesions

Author(s): Van Ongeval C.

Citation: European Journal of Cancer, Supplement, March 2010, vol./is. 8/3(186), 1359-6349 (March 2010)

Publication Date: March 2010

Abstract: The precursor lesions of invasive breast cancer according to the WHO classification consist of lobular neoplasia (LCIS, ALH), ductal intraepithelial neoplasia (DIN) and intraductal papillary neoplasms. The DIN group includes flat epithelial atypia (FEA), atypical ductal hyperplasia (ADH) and ductal carcinoma in situ grade 1-2-3 (DCIS). In the group of the intraductal papillary neoplasms, benign intraductal papilloma, noninvasive papillary carcinoma and encysted papillary carcinoma can be found. A complex sclerosing lesion/radial scar is classified as a benign epithelial neoplasm, but as there is an increase in ADH and DCIS in these lesions, they are discussed as well. Precursor lesions are frequently diagnosed by screening programs, performed to detect early stages of breast cancer. Microcalcifications are the most frequent presentation of lobular neoplasia and DIN lesions. Whereas ADH was previously incidentally diagnosed in biopsies for palpable masses, the incidence of ADH increases as more biopsies are performed for BIRADS-3 and 4 microcalcifications and as larger needles are used. Approximately 80% of the comedo type DCIS shows a typical branching pattern, but 20-25% and the non-comedo DCIS fail to exhibit these characteristics. Other presentations of DCIS include a spiculated lesion, a mass (usually without calcifications) or single duct nipple discharge. Sonography is less important in the evaluation of microcalcifications, but is excellent to guide percutaneous biopsies for the evaluation of a radial scar, papillary and palpable lesions. Vacuum assisted biopsy has a higher accuracy compared to large core biopsy for the evaluation of precursor lesions and is therefore the preferred technique for their preoperative evaluation. Although mammography can detect up to 83% of DCIS, it underestimates the extent of the disease. Magnetic resonance imaging (MRI) is better in predicting the extent and the multifocality of the disease. MRI screening in the follow up of patients with ADH and LCIS is associated with a high false-positive rate resulting in unnecessary breast biopsies: differentiation between the grades of proliferation is not yet possible.

Source: EMBASE

37. Is surgical excision required for B3 breast lesions diagnosed at vacuum-assisted core biopsy?

Author(s): Al-Reefy S., Osman H., Chao C., Perry N., Mokbel K.

Citation: European Journal of Cancer, Supplement, March 2010, vol./is. 8/3(175), 1359-6349 (March 2010)

Publication Date: March 2010

Abstract: Introduction and Background: The aim of this study is to assess whether open surgical excision is required following a B3 diagnosis on 11 gauge vacuum assisted core biopsy (VACB) of radiologically-indeterminate breast lesions. Material and Methods: Twenty-four women with a histological diagnosis of the B3 category on vacuum-assisted core biopsy of radiologically indeterminate breast lesions were identified over a 3 year period. The VACB procedure was performed under stereotactic (n =21), ultrasound (n = 2) or MRI (n =1) guidance by breast radiologists using the Suros system. Microcalcifications (MCC) were evident on specimen radiographs and microscopic slides in all cases of mammographic MCC (n = 20). Nineteen patients underwent open surgical excision following radiological localisation. The remaining 5 patients who had 'complete' removal of the radiological abnormality using VACB under ultrasound (n =2, papillomas) or stereotactic (n = 4, atypical ductal hyperplasia) guidance were followed up clinically and...
radiologically. Results: The median patient's age was 49 years (range = 36-70). Three patients (15.7%) were upgraded to ductal carcinoma in situ (DCIS) at open surgical excision. The VACB showed atypical lobular hyperplasia (ALH) in these 3 patients associated with MCC (n = 2) or mass lesion (n = 1). No single case of upgrade to invasive breast cancer was identified in our series. The remaining patients (84.3%: 16 of 19) had a benign biopsy. The open surgical biopsy in these patients showed benign intraductal papillomas in 2, atypical hyperplasia in 7 and benign MCC without atypical in 7 patients. The upgrade to malignancy was significantly associated with the presence of ALH, a BI-RADS category of 4 and incomplete removal of the radiological abnormality by VACB. After a mean follow up of 18 months (range: 6-30 months), no malignancy was detected in the 5 patients who did not undergo open surgical biopsy. Conclusion: Open surgical excision is strongly recommended for Atypical Lobular Hyperplasia identified in VACB specimens. VACB can be a safe alternative to surgery in the treatment of B3 lesions in selected cases, providing thorough multidisciplinary discussion has taken place.

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38. Evaluation of B3-lesions diagnosed at percutaneous biopsy and surgical results after excision

Author(s): Heywang-Kobrunner S., Nahrig J., Hacker A., Hofler H.

Citation: European Journal of Cancer, Supplement, March 2010, vol./is. 8/3(175), 1359-6349 (March 2010)

Publication Date: March 2010

Abstract: Background: In our country the national screening program was built up starting 7/2006. All minimal invasive breast interventions are prospectively entered into the regional screening RIS data base. After surgery the final histopathologies and postoperative diagnoses are entered. To evaluate the final results after excision of B3/4 lesions depending radiological presentation and histology at percutaneous biopsy. Material and Methods: Between 7/2006 and 9/2008 3925 percutaneous breast biopsies (2423 core needle biopsies = CNB and 1502 stereotactic vacuum assisted breast biopsies = VAB) were performed in 290775 screened women, including 114 B3/B4 lesions among 2423 CNBs and 218 B3/B4 lesions among 1502 VABs. By 9/2008 follow-up data after surgery were available for 86 B3/4-lesions at CNB and 128 B3/4-lesions at VAB. Results: Among the 86 CNBs, 66.3% of B3/4-lesions concerned masses/densities w/wo microcalcifications with a PPV of 33.3%, 16.3% concerned microcalcifications with a PPV of 35.5% and 17.5% architectural distortions/asymmetries with a PPV of 6.9%. Among the 128 VABs 78.1% of B3/4 lesions concerned microcalcifications with a PPV of 21%, 10.4% concerned masses/densities with a PPV of 17.3 and 4.7% concerned architectural distortions with a PPV of 0%. The highest PPV was observed for papillomas with atypias (76%), followed by FEA with LN (50%, one lesion), by ADH (28.9%), radial scars (4.6%) and LN (0%). Conclusion: Further analyses and data may in the future aid to avoid excision of certain B3/4 lesions depending on individual risk factors, biopsy method, radiological appearance and histology from percutaneous biopsy.

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39. Histology after lumpectomy in women with epithelial atypia on stereotactic vacuum-assisted breast biopsy.

Author(s): Graesslin O, Antoine M, Chopier J, Seror JY, Flahault A, Callard P, Darai E, Uzan S

Citation: European Journal of Surgical Oncology, February 2010, vol./is. 36/2(170-5), 0748-7983;1532-2157 (2010 Feb)

Publication Date: February 2010
**Abstract:** BACKGROUND: Large-core needle biopsy of the breast (LCNB) and vacuum-assisted breast biopsy (VABB) are widely used as alternatives to open surgical biopsy (OSB) for initial diagnosis of mammographic abnormalities. Between 18% and 80% of cases in which such specimens show atypical lobular hyperplasia (ALH) or atypical ductal hyperplasia (ADH) are found to be malignant at surgery. DESIGN: From 1999 to 2005, 68 women with mammographic abnormalities were sampled by stereotactic VABB and presented atypical epithelial hyperplasia. Immunohistochemical staining with anti-cytokeratin 5/6 and anti-E-cadherin antibodies was performed. All women underwent a lumpectomy. Clinical, radiological or histological factors predictive of the risk of finding malignancy at surgery were sought. RESULTS: VABB initially showed 28 cases of ADH, 32 cases of ALH, one case of flat epithelial atypia, five cases of mixed atypia, and two cases of Lobular Carcinoma In Situ (LCIS). After slide review with immunohistochemical staining, two cases of ADH were reclassified as simple hyperplasia and two cases of ALH were reclassified as mixed atypia. Seven lesions (10.3%) that appeared to be benign on VABB were found to be malignant on OSB (Ductal Carcinoma In Situ (DCIS) in six cases and invasive ductal carcinoma in one case). ADH was the only predictive factor of malignancy on OSB (p=0.04 versus ALH). CONCLUSION: ADH diagnosed by vacuum-assisted breast biopsy frequently corresponds to cancer on open surgical biopsy. Surgical excision of all breast lesions containing atypical hyperplasia on percutaneous biopsy can be recommended. Copyright (c) 2009 Elsevier Ltd. All rights reserved.

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40. **Flat epithelial atypia and atypical ductal hyperplasia: carcinoma underestimation rate.**

**Author(s):** Ingegnoli A, d'Aloia C, Frattaruolo A, Pallavera L, Martella E, Crisi G, Zompatori M

**Citation:** Breast Journal, January 2010, vol./is. 16/1(55-9), 1075-122X;1524-4741 (2010 Jan-Feb)

**Publication Date:** January 2010

**Abstract:** This study was carried out to determine the underestimation rate of carcinoma upon surgical biopsy after a diagnosis of flat epithelial atypia and atypical ductal hyperplasia and 11-gauge vacuum-assisted breast biopsy. A retrospective review was conducted of 476 vacuum-assisted breast biopsy performed from May 2005 to January 2007 and a total of 70 cases of atypia were identified. Fifty cases (71%) were categorized as pure atypical ductal hyperplasia, 18 (26%) as pure flat epithelial atypia and two (3%) as concomitant flat epithelial atypia and atypical ductal hyperplasia. Each group were compared with the subsequent open surgical specimens. Surgical biopsy was performed in 44 patients with atypical ductal hyperplasia, 15 patients with flat epithelial atypia, and two patients with flat epithelial atypia and atypical ductal hyperplasia. Five cases of atypical ductal hyperplasia were upgraded to ductal carcinoma in situ, three cases of flat epithelial atypia yielded one ductal carcinoma in situ and two cases of invasive ductal carcinoma, and one case of flat epithelial atypia/atypical ductal hyperplasia had invasive ductal carcinoma. The overall rate of malignancy was 16% for atypical ductal hyperplasia (including flat epithelial atypia/atypical ductal hyperplasia patients) and 20% for flat epithelial atypia. The presence of flat epithelial atypia and atypical ductal hyperplasia at biopsy requires careful consideration, and surgical excision should be suggested.

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Available in print at Lincoln County Hospital Professional Library.
41. Assessment of "grading" with Ki-67 and c-kit immunohistochemical expressions may be a helpful tool in management of patients with flat epithelial atypia (FEA) and columnar cell lesions (CCLs) on core breast biopsy.

**Author(s):** Tomasino RM, Morello V, Gullo A, Pompei G, Agnese V, Russo A, Rinaldi G

**Citation:** Journal of Cellular Physiology, November 2009, vol./is. 221/2(343-9), 0021-9541;1097-4652 (2009 Nov)

**Publication Date:** November 2009

**Abstract:** It is essential to reach a better understanding of "flat epithelial atypia/columnar cell lesions" (FEA/CCLs) in breast core biopsies. Our aim was to explore their biological nature, in order to predict the likelihood of an upgrade to carcinoma. "Cytological grading" has been specially focused, in view of its possible utility in the choice of management. One hundred thirty of a total of 900 cases core needle (CN)/vacuum-assisted biopsies (VABs), with diagnoses of "hyperplasia" and "atypia" were retrospectively re-evaluated. Pathological findings of further excision biopsies (FEBs) performed in 40/75 patients with follow-up were compared with the previous diagnoses. In all cases, both Ki-67 and c-kit immunoreactivities were explored and compared with both normal breast tissues and subsequently documented cancers, with special reference to the hyperplastic FEA/CCLs, with "mild" atypia (FEA/CCHAm). Sixteen cases were re-diagnosed as "usual ductal hyperplasia" (UDH), 60 as "columnar cell hyperplasia" (CCH), and 54 as FEA/CCHA, 30 of which FEA/CCHAm and 24 FEA/CCHAh (with high atypia). Significantly, the Ki-67 index proved to be on the increase and c-kit expression on the decrease in FEA/CCHA lesions, mainly in the FEA/CCHAh group and in the subsequently observed cancers, compared with either benign tissues or the FEA/CCH cases. It was also significant that most of the carcinomas were found in FEBs within the FEA/CCHAh group. In this study cytological grading, together with Ki-67 and c-kit indices, proved to be helpful in FEA/CCLs evaluation. With regard to FEA/CCHAm lesions, an adequate surveillance appears to be a more appropriate management tool than FEB, as a result of their biological nature and behavior.

**Source:** MEDLINE

**Full Text:** Available in fulltext at EBSCOhost

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42. Magnetic resonance imaging-guided vacuum-assisted breast biopsy: an initial experience in a community hospital.

**Author(s):** Friedman P, Enis S, Pinyard J

**Citation:** Canadian Association of Radiologists Journal, October 2009, vol./is. 60/4(196-200), 0846-5371;0846-5371 (2009 Oct)

**Publication Date:** October 2009

**Abstract:** OBJECTIVE: To evaluate the effectiveness in diagnosing mammographically and sonographically occult breast lesions by using magnetic resonance imaging (MRI) guided vacuum-assisted breast biopsy in patients who presented to a community-based hospital with a newly established breast MRI program. METHODS: The records of 142 consecutive patients, median age of 55 years, who had undergone MRI-guided biopsy at our institution between July 2006 and July 2007 were reviewed. From these patients, 197 mammographically and sonographically occult lesions were biopsied at the time of discovery. The pathology was then reviewed and correlated with the MRI findings. RESULTS: Cancer was present and subsequently discovered in 8% of the previously occult lesions (16/197) or 11% of the women studied (16/142). Of the cancerous lesions, 56% were invasive carcinomas (9/16) and 44% were ductal carcinomas in situ (7/16). Fourteen percent of the discovered lesions (28/197) were defined as high risk and included atypical ductal hyperplasia, atypical lobular hyperplasia, lobular carcinoma in situ, and radial scar. In total, occult cancerous and high-risk lesions were discovered in 22% of the found lesions (44/197) or 31% of the women who underwent MRI-guided biopsy (44/142). CONCLUSIONS: This study demonstrated that detection of cancerous and high-risk lesions can be significantly increased when an MRI-guided biopsy program is introduced at a community-based hospital. We believe that as radiologists gain confidence
in imaging and histologic correlation, community-based hospitals can achieve similar rates of occult lesion diagnosis as those found in data emerging from academic institutions.

**Source:** MEDLINE

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**43. Two-year follow-up of stereotactically guided 9-G breast biopsy: a multicenter evaluation of a self-contained vacuum-assisted device.**

**Author(s):** Pfleiderer SO, Brunzlow H, Schulz-Wendtland R, Pamilo M, Vag T, Camara O, Facius M, Runnebaum IB, Dean PB, Kaiser WA

**Citation:** Clinical Imaging, September 2009, vol./is. 33/5(343-347), 0899-7071;1873-4499 (2009 Sep-Oct)

**Publication Date:** September 2009

**Abstract:** PURPOSE: To evaluate the performance of a self-contained, battery-driven, vacuum-assisted breast biopsy (VABB) system for the sampling of clustered breast microcalcifications and masses under stereotactic guidance.
METHODS AND MATERIALS: A total of 144 patients (median age: 56 years; range: 21-87 years) in four European breast centers underwent percutaneous 9-gauge (G) stereotactic-guided VABB. The median lesion size was 11 mm (range 2-60 mm). Patients were biopsied in the prone (n=125) or upright position (n=19). All patients were followed up for at least 24 months.
RESULTS: The stereotactic procedure was successful in 142 (98.6%) of 144 cases, with two cases cancelled due to either severe patient motion (one case) or failure to detect faint calcifications (one case). A median of 12 specimens per procedure was obtained. In 39 cases (27.5%), the suspicious lesion could no longer be detected mammographically after the biopsy procedure. The histological diagnosis was malignancy in 45 (31.7%) cases. One case of atypical ductal hyperplasia diagnosed preoperatively was upgraded to ductal carcinoma in situ (DCIS) at operation, giving an overall sensitivity of 97.7% for the vacuum-assisted biopsy procedure. In two cases where DCIS was diagnosed at vacuum-assisted biopsy, the malignant tissue was apparently completely removed and could no longer be found at operation. No serious complications occurred. During the follow-up period, no breast cancers appeared at the location of biopsy. Six patients dropped out during the follow-up period.
CONCLUSION: The self-contained, vacuum-assisted biopsy device is well suited for stereotactically guided breast biopsies, having demonstrated excellent sensitivity and specificity in the preoperative workup of mammographically detected breast lesions after 2 years of follow-up.

**Source:** MEDLINE

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**44. Two-year follow-up of stereotactically guided 9-G breast biopsy: a multicenter evaluation of a self-contained vacuum-assisted device**

**Author(s):** Pfleiderer S.O.R., Brunzlow H., Schulz-Wendtland R., Pamilo M., Vag T., Camara O., Facius M., Runnebaum I.B., Dean P.B., Kaiser W.A.

**Citation:** Clinical Imaging, September 2009, vol./is. 33/5(343-347), 0899-7071 (September/October 2009)

**Publication Date:** September 2009

**Abstract:** Purpose: To evaluate the performance of a self-contained, battery-driven, vacuum-assisted breast biopsy (VABB) system for the sampling of clustered breast microcalcifications and masses under stereotactic guidance. Methods and materials: A total of 144 patients (median age: 56 years; range: 21-87 years) in four European breast centers underwent percutaneous 9-gauge (G) stereotactic-guided VABB. The median lesion size was 11 mm (range 2-60 mm). Patients were biopsied in the prone (n=125) or upright position (n=19). All patients were followed up for at least 24 months. Results: The
surgical procedure was successful in 142 (98.6%) of 144 cases, with two cases cancelled due to either severe patient motion (one case) or failure to detect faint calcifications (one case). A median of 12 specimens per procedure was obtained. In 39 cases (27.5%), the suspicious lesion could no longer be detected mammographically after the biopsy procedure. The histological diagnosis was malignancy in 45 (31.7%) cases. One case of atypical ductal hyperplasia diagnosed preoperatively was upgraded to ductal carcinoma in situ (DCIS) at operation, giving an overall sensitivity of 97.7% for the vacuum-assisted biopsy procedure. In two cases where DCIS was diagnosed at vacuum-assisted biopsy, the malignant tissue was apparently completely removed and could no longer be found at operation. No serious complications occurred. During the follow-up period, no breast cancers appeared at the location of biopsy. Six patients dropped out during the follow-up period. Conclusion: The self-contained, vacuum-assisted biopsy device is well suited for stereotactically guided breast biopsies, having demonstrated excellent sensitivity and specificity in the preoperative workup of mammographically detected breast lesions after 2 years of follow-up. 2009.

Source: EMBASE

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45. Accuracy of stereotactic vacuum-assisted breast biopsy with a 10-gauge handheld system.

Author(s): Salem C, Sakr R, Chopier J, Marsault C, Uzan S, Darai E

Citation: Breast, June 2009, vol./is. 18/3(178-82), 0960-9776;1532-3080 (2009 Jun)

Publication Date: June 2009

Abstract: OBJECTIVE: The aim of this study is to evaluate the accuracy and the safety of stereotactic vacuum-assisted breast biopsy with a 10-gauge hand-held portable system.MATERIALS AND METHODS: Retrospective data review of 288 consecutive breast lesions that underwent stereotactic 10-gauge hand-held portable vacuum-assisted biopsy from October 2004 through March 2006, was performed. The mean number of core specimens and the percentage of complete radiological removal of the target lesion were analysed. ADH and DCIS under-estimation were evaluated, as were the immediate and delayed complications due to the procedure.RESULTS: The mean number of core specimens obtained per procedure was 9 (range 4-24). Complete radiological excision of the target lesion was achieved in 31.6% (91 of 288) with 91% of these lesions smaller than 10mm (mean size 7 mm; range 4-20mm). Under-estimation of ADH and DCIS was 18.2% (2 of 11) and 19.2% (9 of 47), respectively. There was no false negative result within a 3-year follow-up (from 2005 till date). Complications were mild and consisted of immediate bleeding and delayed haematomas.CONCLUSION: Breast biopsy using 10-gauge vacuum system is an accurate and safe technique for sampling non-palpable breast lesions.

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Available in fulltext at ULHT journal article requests. Complete the online form to obtain articles.

46. Columnar cell lesions associated with breast calcifications on vacuum-assisted core biopsies: clinical, radiographic, and histological correlations.

Author(s): Senetta R, Campanino PP, Mariscotti G, Garberoglio S, Daniele L, Penneccchi F, Macri L, Bosco M, Gandini G, Sapino A

Citation: Modern Pathology, June 2009, vol./is. 22/6(762-9), 0893-3952;1530-0285 (2009 Jun)

Publication Date: June 2009

Abstract: Columnar cell lesions of the breast are increasingly recognized at mammography for their tendency to calcify. We studied 392 vacuum-assisted core biopsies performed solely for calcifications to evaluate the frequency of columnar cell lesions, their relationship with radiological risk, appearance of calcifications, and clinical data. Management and follow-up of columnar cell lesions without and with atypia (flat epithelial
atypia) was analyzed. Cases with architectural atypia (cribriform spaces and/or micropapillae) were excluded from flat epithelial atypia. Calcifications were within the lumen of acini affected by columnar cell lesions in 137 out of 156 biopsies diagnosed with some columnar cell lesions. These represented 37% of vacuum-assisted core biopsies and 62% of low radiological risk (BI-RADS3) calcifications. High-risk (BI-RADS5) calcifications were never associated with columnar cell lesions. Age and menopausal status were comparable in columnar and in not-columnar cell lesions. Atypia was associated with long-term hormone replacement therapy in both lesions. Surgical biopsy was recommended for all cases with atypia. Flat epithelial atypia, as the only histological findings on vacuum-assisted core biopsies, was never associated with malignancy at surgery. In conclusion, we suggest that surgical excision is not mandatory when flat epithelial atypia is found as the most advanced lesion on vacuum-assisted core biopsy performed for low radiological risk calcifications, and that women should be advised of the possible hormone dependency of this entity.

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47. Frequency and upgrade rates of atypical ductal hyperplasia diagnosed at stereotactic vacuum-assisted breast biopsy: 9-versus 11-gauge.

Author(s): Eby PR, Ochsner JE, DeMartini WB, Allison KH, Peacock S, Lehman CD

Citation: AJR. American Journal of Roentgenology, January 2009, vol./is. 192/1(229-34), 0361-803X;1546-3141 (2009 Jan)

Publication Date: January 2009

Abstract: OBJECTIVE: Our goals were to determine the frequency and upgrade rate for atypical ductal hyperplasia (ADH) diagnosed with stereotactic 9-gauge vacuum-assisted breast biopsy and to compare the frequencies and upgrade rates of ADH between 9- and 11-gauge vacuum-assisted breast biopsy. MATERIALS AND METHODS: We retrospectively reviewed the pathology results of 991 consecutive 9- or 11-gauge stereotactic vacuum-assisted breast biopsy procedures from February 2001 through June 2006 and identified lesions diagnosed as ADH. The final diagnosis after surgical excision was determined from medical records. The frequencies and upgrade rates to carcinoma were calculated for all ADH lesions and compared between 9- and 11-gauge procedures. The number of core samples was recorded and compared. RESULTS: One hundred forty-one of 991 (14.2%) lesions yielded a diagnosis of ADH at 9- or 11-gauge stereotactic vacuum-assisted breast biopsy. Upgrade to ductal carcinoma in situ or invasive carcinoma occurred in 26 of 123 (21.1%) patients. The frequency of ADH was 83 of 600 (13.8%) lesions for 9-gauge and 58 of 391 (14.8%) lesions for 11-gauge vacuum-assisted breast biopsy. The 9-gauge upgrade rate was 16 of 74 (21.6%) lesions compared with 10 of 49 (20.4%) lesions for 11-gauge vacuum-assisted breast biopsy. There was no significant difference between the number of core samples obtained with each device (p=0.40). Neither the frequency of ADH (p=0.66) nor the upgrade rates (p=0.87) were significantly different between 9- and 11-gauge vacuum-assisted breast biopsy. CONCLUSION: Compared with an 11-gauge vacuum-assisted breast biopsy device, the use of a larger 9-gauge vacuum-assisted breast biopsy needle does not decrease the upgrade rate of ADH. Our frequency of ADH at vacuum-assisted breast biopsy is higher than any previously reported and may reflect regional differences in the incidence of breast cancer or practice patterns of the pathologist.

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Available in fulltext at Lincoln County Hospital Professional Library; Note: Username:
48. MR-guided vacuum-assisted breast biopsy: Is it an essential technique?

Author(s): Tozaki M., Yamashiro N., Suzuki T., Kawano N., Ozaki S., Sakamoto N., Abe S., Ogawa T., Katayama N., Tsunoda Y., Fukuma E.

Citation: Breast Cancer, 2009, vol./is. 16/2(121-125), 1340-6868 (2009)

Publication Date: 2009

Abstract: Background: In the United States and Europe, MR-guided vacuum-assisted biopsy (VAB) is required for MR-only visible suspicious lesions that cannot be identified with mammography or ultrasonography. However, it is controversial as to whether MR-guided VAB is essential or not in Japan. The purpose of this study was to clarify the frequency of malignancy among the patients that underwent MR-guided VAB, and to discuss the need for this technique in Japan. Methods: This study was approved by the Institutional Review Board of our hospital. A retrospective review was performed of 30 consecutive patients who had undergone MR-guided 11-gauge VAB. The biopsies were performed on a 1.5 T MR scanner using a commercially available biopsy system. All lesions seen with MRI could not be detected by mammography and second-look ultrasonography. Results: All 30 lesions were assessed as category 4 or 5. The average lesion size of a mass enhancement before biopsy was 0.7 cm, and the average lesion size of a non-mass-like enhancement was 2.3 cm. The average number of cores of VAB was 19. The median time required to perform the VAB procedure was 35 min. The biopsy was successfully performed without important side effects in all patients. Histopathological findings were invasive ductal carcinoma in one (3%); ductal carcinoma in situ (DCIS) in seven (23%); and benign in 22 (73%). In one case, atypical ductal hyperplasia at VAB was upgraded to DCIS at surgical excision. Conclusion: MR-guided VAB can be performed safely and it is needed for MR-only visible suspicious lesions in Japan. 2008 The Japanese Breast Cancer Society.

Source: EMBASE

Full Text: Available in fulltext at ULHT journal article requests. Complete the online form to obtain articles.

49. Frequency and upgrade rates of atypical ductal hyperplasia diagnosed at stereotactic vacuum-assisted breast biopsy: 9- Versus 11-gauge

Author(s): Eby P.R., Ochsner J.E., DeMartini W.B., Allison K.H., Peacock S., Lehman C.D.

Citation: American Journal of Roentgenology, January 2009, vol./is. 192/1(229-234), 0361-803X (January 2009)

Publication Date: January 2009

Abstract: OBJECTIVE. Our goals were to determine the frequency and upgrade rate for atypical ductal hyperplasia (ADH) diagnosed with stereotactic 9-gauge vacuum-assisted breast biopsy and to compare the frequencies and upgrade rates of ADH between 9- and 11-gauge vacuum-assisted breast biopsy. MATERIALS AND METHODS. We retrospectively reviewed the pathology results of 991 consecutive 9- or 11-gauge stereotactic vacuum-assisted breast biopsy procedures from February 2001 through June 2006 and identified lesions diagnosed as ADH. The final diagnosis after surgical excision was determined from medical records. The frequencies and upgrade rates to carcinoma were calculated for all ADH lesions and compared between 9- and 11-gauge procedures. The number of core samples was recorded and compared. RESULTS. One hundred forty-one of 991 (14.2%) lesions yielded a diagnosis of ADH at 9- or 11-gauge stereotactic vacuum-assisted breast biopsy. Upgrade to ductal carcinoma in situ or invasive carcinoma occurred in 26 of 123 (21.1%) patients. The frequency of ADH was 83 of 600 (13.8%) lesions for 9-gauge and 58 of 391 (14.8%) lesions for 11-gauge vacuumassisted breast biopsy. The 9-gauge upgrade rate was 16 of 74 (21.6%) lesions compared with 10 of 49 (20.4%) lesions for 11-gauge vacuum-assisted breast biopsy. There was no significant difference between the number of core samples obtained with each device (p = 0.40). Neither the frequency of ADH (p = 0.66) nor the upgrade rates (p = 0.87) were significantly different between 9- and 11-gauge vacuum-assisted breast biopsy. CONCLUSION.
Compared with an 11-gauge vacuum-assisted breast biopsy device, the use of a larger 9-gauge vacuum-assisted breast biopsy needle does not decrease the upgrade rate of ADH. Our frequency of ADH at vacuum-assisted breast biopsy is higher than any previously reported and may reflect regional differences in the incidence of breast cancer or practice patterns of the pathologist. American Roentgen Ray Society.

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50. Can we predict which cases of atypical ductal hyperplasia on breast core needle biopsy will upgrade?

Author(s): Allison K.H., Eby P.R., Kohr J., Demartini W.B., Lehman C.D.
Citation: Laboratory Investigation, January 2009, vol./is. 89/(26A), 0023-6837 (January 2009)
Publication Date: January 2009

Abstract: Background: Prior studies suggest atypical ductal hyperplasia (ADH) involving <=2 foci at 11-or 14-gauge stereotactic vacuum assisted breast biopsy (VABB) may not require surgical excision because upgrading to carcinoma does not occur. Design: Retrospective review of 991 consecutive 9-or 11-gauge stereotactic VABB procedures from February 2001 through June 2006 identified 94 cases performed for mammographic calcifications, confirmed to contain ADH on blinded pathology review. All of these cases had subsequent surgical follow-up. Each large duct or terminal duct-lobular unit containing ADH was counted as a focus and the total number of foci were determined for each case. The largest span of contiguous ADH was measured. The presence of a micropapillary growth pattern or findings suspicious for DCIS was noted. Pathology reports of the excisional biopsy specimens were reviewed to determine which cases upgraded. Results: Fifteen of 94 (16%) cases of ADH upgraded to carcinoma on excision (13 DCIS, 2 invasive). Cases with > 2 foci were significantly more likely to upgrade (12 of 51 upgraded, P=0.045, Fisher's exact test), but the risk of upgrade for cases with <= 2 foci was 7% (3/43). The greatest diameter of ADH in the 15 cases that upgraded ranged from 0.2-5.0 mm with 27% measuring <= 1.0 mm. The subjective interpretation of "suspicious for DCIS" was a significant predictor of upgrade with 35% (8/23) of cases categorized as suspicious upgrading compared to 10% (7/71) of cases that were not called suspicious (P=0.008). Micropapillary features were noted in 10/15 (67%) cases that upgraded compared to 35/79 (44%) cases that did not upgrade but the result did not reach statistical significance. Conclusions: The risk of upgrade of ADH is associated with the number of foci involved and subjective suspicion for DCIS. However, upgrade at surgical excision can occur even when <= 2 foci of ADH are found at VABB. A standardized method of reporting ADH could be used to assess individual patient risk of upgrade and make recommendations for surgical excision.

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51. US-guided vacuum-assisted biopsy of microcalcifications in breast lesions and long-term follow-up results

Author(s): Hua S.K., Min J.K., Kim E.-K., Jin Y.K., Eun J.S., Ki K.O.
Citation: Korean Journal of Radiology, December 2008, vol./is. 9/6(503-509), 1229-6929 (December 2008)
**Publication Date:** December 2008

**Abstract:** Objective: To evaluate the diagnostic accuracy of the use of an ultrasonography (US)-guided vacuum-assisted biopsy for microcalcifications of breast lesions and to evaluate the efficacy of the use of US-guided vacuum-assisted biopsy with long-term follow-up results. Materials and Methods: US-guided vacuum-assisted biopsy cases of breast lesions that were performed between 2002 and 2006 for microcalcifications were retrospectively reviewed. A total of 62 breast lesions were identified where further pathological confirmation was obtained or where at least two years of mammography follow-up was obtained. These lesions were divided into the benign and malignant lesions (benign and malignant group) and were divided into underestimated group and not-underestimated lesions (underestimated and not-underestimated group) according to the diagnosis after a vacuum-assisted biopsy. The total number of specimens that contained microcalcifications was analyzed and the total number of microcalcification flecks as depicted on specimen mammography was analyzed to determine if there was any statistical difference between the groups. Results: There were no false negative cases after more than two years of follow-up. Twenty-nine lesions were diagnosed as malignant (two invasive carcinomas and 27 carcinoma in situ lesions). Two of the 27 carcinoma in situ lesions were upgraded to invasive cancers after surgery. Among three patients diagnosed with atypical ductal hyperplasia, the diagnosis was upgraded to a ductal carcinoma in situ after surgery in one patient. There was no statistically significant difference in the number of specimens with microcalcifications and the total number of microcalcification flecks between the benign group and malignant group of patients and between the underestimated group and not-underestimated group of patients. Conclusion: US-guided vacuum-assisted biopsy can be an effective alternative to stereotactic-guided vacuum-assisted biopsy in cases where microcalcifications are visible with the use of high-resolution US.

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52. Lobular neoplasia: core needle breast biopsy underestimation of malignancy in relation to radiologic and pathologic features.

**Author(s):** Londero V, Zuiani C, Linda A, Vianello E, Furlan A, Bazzocchi M

**Citation:** Breast, December 2008, vol./is. 17/6(623-30), 0960-9776;1532-3080 (2008 Dec)

**Publication Date:** December 2008

**Abstract:** The purpose of this study is to assess the positive predictive value (PPV) for malignancy of core needle biopsy (CNB) demonstrating lobular neoplasia (LN). From 3920 CNBs, 35 (0.89%) LNs (14 atypical lobular hyperplasia - ALH - and 21 lobular carcinoma in situ - LCIS) were identified. Twenty-eight patients underwent surgical excision and seven radiologic follow-up. We describe the imaging findings and excision histology outcomes. We report the PPV for malignancy based on excision history (n=28) and on excision or follow-up (n=35), and according to the histologic type, biopsy probe and guidance, lesion diameter, and BI-RADS category. PPV for malignancy (based on excision history) was 46.4% (13/28) and PPV (based on excision or follow-up) was 37.1% (13/35). The overall rate of malignancy for LN was 37.1% (13/35), with a PPV for malignancy of ALH and LCIS of 7.1% (1/14) and 57.1% (12/21), respectively (p=0.003). Estimates of the PPV for malignancy were: stereotactic-guided vacuum-assisted biopsy (22.7%) versus ultrasound-guided automated CNB (61.5%), p=0.053; lesions<20mm (31.2%) versus lesions>20mm (100%), p=0.043; lesions classified as BI-RADS 3 (16.7%) versus BI-RADS 4 or 5 (41.4%), p=0.377. Underestimation of malignancy was therefore more likely in cases of LCIS, US-guided CNB, and lesions that were large and suspicious on imaging. Nevertheless, the absence of these features does not spare the need for surgical excision in lobular neoplasia diagnosed on CNB.

**Source:** MEDLINE

**Full Text:**
53. Is surgical excision necessary for focal atypical ductal hyperplasia found at stereotactic vacuum-assisted breast biopsy?.

**Author(s):** Eby PR, Ochsner JE, DeMartini WB, Allison KH, Peacock S, Lehman CD

**Citation:** Annals of Surgical Oncology, November 2008, vol./is. 15/11(3232-8), 1068-9265;1534-4681 (2008 Nov)

**Publication Date:** November 2008

**Abstract:** BACKGROUND: Our goal was to determine the upgrade rate for lesions described as focal atypical ductal hyperplasia (ADH) after 9- or 11-gauge stereotactic vacuum-assisted breast biopsy (VABB) to determine whether surgical excision is indicated in this setting. METHODS: We retrospectively reviewed the results of 991 consecutive 9- or 11-gauge stereotactic core VABB procedures from February 2001 through June 2006 and identified lesions diagnosed as ADH. On the basis of the descriptions in pathology reports each lesion was placed in one of three categories: (1) focal ADH, (2) ADH suspicious for ductal carcinoma-in-situ, or (3) ADH not otherwise specified. The final diagnosis after surgical excisional biopsy was determined from medical records. The frequencies and upgrade rates to carcinoma were calculated and compared for all lesions and for each ADH category. RESULTS: A total of 141 (14.2%) of 991 lesions yielded ADH at stereotactic core VABB, and 123 (87.2%) of 141 underwent surgical excisional biopsy of the stereotactic core VABB site. A total of 56 (45.5%) of 123 were categorized as focal ADH, and 7 (12.5%) of 56 were upgraded to carcinoma. A total of 49 (39.8%) of 123 were categorized as ADH not otherwise specified, and 11 (22.4%) of 49 were upgraded. Eighteen (14.6%) of 123 were categorized as suspicious for ductal carcinoma-in-situ, and 8 (44.4%) of 18 were upgraded. Neither the frequency of ADH (P = .66) nor the upgrade rates (P = .87) were significantly different between 9- and 11-gauge VABB. CONCLUSION: Surgical excisional biopsy is indicated to exclude carcinoma in cases of focal ADH discovered at 9- or 11-gauge VABB.

**Source:** MEDLINE

**Full Text:** Available in fulltext at ULHT journal article requests. Complete the online form to obtain articles.

54. Underestimation of atypical ductal hyperplasia at sonographically guided core biopsy of the breast.

**Author(s):** Jang M, Cho N, Moon WK, Park JS, Seong MH, Park IA

**Citation:** AJR. American Journal of Roentgenology, November 2008, vol./is. 191/5(1347-51), 0361-803X;1546-3141 (2008 Nov)

**Publication Date:** November 2008

**Abstract:** OBJECTIVE: The purpose of this study was to determine the rate of underestimation of atypical ductal hyperplasia (ADH) at sonographically guided core biopsy of the breast and to identify the factors involved. MATERIALS AND METHODS: We retrospectively reviewed 3,563 lesions consecutively evaluated with sonographically guided core biopsy between January 2002 and June 2006. Histologic analysis yielded ADH in 60 of the 3,563 lesions (1.7%). The rate of underestimation of ADH was determined by dividing the number of lesions that proved to be carcinoma at surgical excision by 44, the total number of lesions evaluated with excisional biopsy. Clinical, sonographic, and core biopsy features were analyzed to identify factors that affect the rate of underestimation of ADH. RESULTS: The rate of underestimation of ADH was found to be 48% (21 of 44 lesions). Underestimation of ADH was significantly less frequent for lesions evaluated with 11-gauge vacuum-assisted biopsy than for lesions evaluated with 14-gauge automated gun biopsy (22% [four of 18 lesions] vs 65% [17 of 26 lesions], p = 0.012). The other clinical, sonographic, and biopsy features examined did not affect the rate of underestimation of ADH. CONCLUSION: For sonographically guided core biopsy of the breast, the rate of underestimation of ADH was 48%. This rate was lower for lesions evaluated with 11-gauge vacuum-assisted biopsy (22%) than for those evaluated with 14-gauge automated gun biopsy (65%). This finding was particularly true of smaller lesions (< or = 2.0 cm) and for
lesions of the mass-only type.

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55. Imprint cytology of vacuum-assisted breast biopsy specimens: A rapid diagnostic tool in non-palpable solid lesions


Citation: Cytopathology, October 2008, vol./is. 19/5(311-315), 0956-5507;1365-2303 (October 2008)

Publication Date: October 2008

Abstract: Objective: Imprint cytology provides a rapid preliminary diagnosis shortly after the completion of breast biopsy. This study aims to assess the validity of imprint cytology for the pre-operative diagnosis of non-palpable mammographic solid lesions excised by vacuum-assisted breast biopsy (VABB). Methods: Seventy-two women with non-palpable Breast Imaging Reporting and Data System 3 and 4 mammographic solid lesions without microcalcifications underwent VABB on the stereotactic Fischer's table with 11-G Mammotome vacuum probes. Imprint samples were examined (Diff-Quick stain, modified Papanicolaou stain and May-Grunwald-Giemsa). The cores were dipped into a CytoRich Red Collection fluid for a few seconds in order to obtain samples with the use of the specimen wash. After the completion of cytological procedures, the core was prepared for routine pathological study. The pathologist was blind to the preliminary cytological results. The cytological and pathological diagnoses were comparatively evaluated. Results: The sensitivity of the cytological imprints for cancer was 90%. The specificity of the method for cancer diagnosis was 100%. Two precursor lesions were present in the material: one case of atypical ductal hyperplasia, which was successfully detected, and one case of lobular neoplasia, which escaped detection. The cytological imprints were inadequate in four out of 72 cases (5.6%), but none of them were included within the malignant subgroup. Conclusions: Imprint cytology seems to be an important adjunctive tool in the management of patients with non-palpable mammographic solid lesions. Its very satisfactory sensitivity and optimal specificity could establish its use in general clinical practice. 2007 The Authors.

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56. The use of a vacuum-assisted biopsy device (Mammotome) in the early detection of breast cancer in the United Arab Emirates

Author(s): Faour I., Al-Salam S., El-Terifi H., El Taji H.

Citation: Recent Advances in Clinical Oncology, September 2008, vol./is. 1138/(108-113), 0077-8923;1749-6632 (September 2008)

Publication Date: September 2008

Abstract: Stereotactic core needle biopsy has proven to be an accurate technique for evaluation of mammographically detected microcalcification. The development of the Mammotome biopsy system has led many medical centers to use this vacuum-assisted device for the sampling of microcalcifications in mammographically detected nonpalpable breast lesions. Ninety-six women underwent 101 stereotactic Mammotome core biopsies for mammographic calcifications over a 32-month period in the Department of Surgery at Tawam Hospital, the national referral oncology center in the UAE. The stereotactic
procedure was performed by surgeons using the Mammotome biopsy system. Microcalcifications were evident on specimen radiographs and microscopic sections in 96% and 87% of the cases, respectively. Excisional biopsy was recommended for diagnoses of atypical ductal hyperplasia or carcinoma. Patients with benign diagnoses underwent mammographic follow-up. Eighty-one lesions were benign, 5 atypical ductal hyperplasias and 14 carcinomas were diagnosed (2 invasive lobular carcinoma, 4 invasive ductal carcinoma, and 8 intraductal carcinomas in situ: 1 comedo, 1 cribriform, 6 mixed cribriform and micropapillary). Surgical excision in four patients with atypia on Mammotome biopsy (one was lost to follow-up) showed atypical ductal hyperplasia. Surgical excision in seven patients diagnosed with intraductal carcinoma in situ (one patient lost to follow-up) showed intraductal carcinoma with no evidence of microinvasion. Similar diagnoses were made in all the invasive ductal and lobular carcinomas in both Mammotome and excisional biopsies. A diagnosis of atypia on Mammotome biopsy warranted excision of the atypical area, yet the underestimation rate for the presence of carcinoma remained low. The likelihood of an invasive component at excision was negligible for microcalcification diagnosed as intraductal carcinoma in situ on Mammotome biopsy. Mammotome biopsy proved to be an accurate technique for the sampling, diagnosis, and early detection of breast cancer. 2008 New York Academy of Sciences.

Source: EMBASE

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57. MR imaging-guided 10-gauge vacuum-assisted breast biopsy: Histological characterisation [Italian;English] Imaging RM. Biopsia della mammella con sistema di retro aspirazione RM guidato da 10 gauge: Caratterizzazione istologica

Author(s): Perretta T., Pistolese C.A., Bolacchi F., Cossu E., Fiaschetti V., Simonetti G.

Citation: Radiologia Medica, September 2008, vol./is. 113/6(830-840), 0033-8362 (September 2008)

Publication Date: September 2008

Abstract: Purpose. The aim of this study was to evaluate a handheld vacuum-assisted device for magnetic resonance imaging (MRI)-guided breast biopsy. Materials and methods. In 47 patients, a total of 47 suspicious breast lesions (mean maximum diameter 9 mm) seen with MRI (no suspicious changes on breast ultrasound or mammography) were sampled using a 10-gauge vacuum-assisted breast biopsy (VAB) device under MRI guidance. Histology of biopsy specimens was compared with final histology after surgery or with follow-up in benign lesions. Results. Technical success was achieved in all biopsies. Histological results from VAB revealed malignancy in 15 lesions (32%), atypical ductal hyperplasia in four lesions (8%) and benign findings in 28 lesions (60%). One of four lesions with atypical ductal hyperplasia was upgraded to ductal carcinoma in situ after surgery. One of seven lesions showing ductal carcinoma was upgraded to invasive carcinoma after surgery. Two lesions diagnosed as infiltrating carcinoma by VAB were not validated at excisional biopsy due to complete removal of the lesion during the procedure. During the follow-up (mean 18 months) of histologically benign lesions, we observed no cases of breast cancer development. Because of morphological changes on follow-up MRI scans, two lesions underwent surgical excision, which confirmed their benign nature. Besides minor complications (massive bleeding, n=1) requiring no further therapeutic intervention, no complications occurred. Conclusions. MRI-guided biopsy of breast lesions using a handheld vacuum-assisted device is a safe and effective method for the workup of suspicious lesions seen on breast MRI alone. 2008 Springer-Verlag.

Source: EMBASE

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58. MR imaging-guided 10-gauge vacuum-assisted breast biopsy: histological characterisation.

Author(s): Perretta T, Pistolese CA, Bolacchi F, Cossu E, Fiaschetti V, Simonetti G
PURPOSE: The aim of this study was to evaluate a handheld vacuum-assisted device for magnetic resonance imaging (MRI)-guided breast biopsy. MATERIALS AND METHODS: In 47 patients, a total of 47 suspicious breast lesions (mean maximum diameter 9 mm) seen with MRI (no suspicious changes on breast ultrasound or mammography) were sampled using a 10-gauge vacuum-assisted breast biopsy (VAB) device under MRI guidance. Histology of biopsy specimens was compared with final histology after surgery or with follow-up in benign lesions. RESULTS: Technical success was achieved in all biopsies. Histological results from VAB revealed malignancy in 15 lesions (32%), atypical ductal hyperplasia in four lesions (8%) and benign findings in 28 lesions (60%). One of four lesions with atypical ductal hyperplasia was upgraded to ductal carcinoma in situ after surgery. One of seven lesions showing ductal carcinoma was upgraded to invasive carcinoma after surgery. Two lesions diagnosed as infiltrating carcinoma by VAB were not validated at excisional biopsy due to complete removal of the lesion during the procedure. During the follow-up (mean 18 months) of histologically benign lesions, we observed no cases of breast cancer development. Because of morphological changes on follow-up MRI scans, two lesions underwent surgical excision, which confirmed their benign nature. Besides minor complications (massive bleeding, n = 1) requiring no further therapeutic intervention, no complications occurred. CONCLUSIONS: MRI-guided biopsy of breast lesions using a handheld vacuum-assisted device is a safe and effective method for the workup of suspicious lesions seen on breast MRI alone.
experience.

Author(s): Teng-Swan Ho J, Tan PH, Hee SW, Su-Lin Wong J
Citation: Breast, August 2008, vol./is. 17/4(401-6), 0960-9776;0960-9776 (2008 Aug)
Publication Date: August 2008

Abstract: The incidence of malignancy in excision biopsies performed for atypical ductal hyperplasia (ADH) diagnosed on needle biopsies has decreased since the advent of larger tissue sampling and improved accuracy using vacuum-assisted Mammotome biopsy. We undertook a retrospective study to identify predictive factors for understaging of ADH diagnosed on 11-gauge Mammotome biopsy, to determine whether it was possible to avoid surgical excision in women where mammographically visible calcifications had been completely removed. Sixty-one biopsy diagnosed ADH lesions were correlated with surgical excision findings that revealed DCIS in 14 (23%). The mammographic and biopsy features were statistically analyzed using Fisher's exact test. There was no association between morphology, extent of calcifications, number of cores sampled with underestimation of malignancy (P=0.503, 0.709, 0.551 respectively). In the absence of residual calcifications, the frequency of underestimation of carcinoma still occurred in 17%.

Source: MEDLINE

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61. Upright stereotactic vacuum-assisted needle biopsy of suspicious breast microcalcifications.

Author(s): Sim LS, Kei PL
Citation: Journal of Medical Imaging & Radiation Oncology, August 2008, vol./is. 52/4(358-64), 1754-9477;1754-9485 (2008 Aug)
Publication Date: August 2008

Abstract: Stereotactic core needle biopsy is a useful technique for evaluation of suspicious breast microcalcifications. The development of the 11-G vacuum-assisted biopsy system offers another method of minimally invasive biopsy carried out on a conventional mammography unit. We evaluate its usefulness, efficacy and safety in Asian women. Vacuum-assisted biopsy was carried out through the lateral approach using an add-on stereotactic device attached to a mammography unit. One hundred and five lesions were sampled in 97 patients. Excisional biopsy was subsequently Carried out for diagnosis of atypical ductal hyperplasia or carcinoma in high-risk patients. Patients with benign diagnosis underwent mammographic follow up. The technical success rate was 97%. An average of 13.5 tissue cores were retrieved for each lesion. The histopathological result obtained from mammotome was benign in 84.8% and malignant in 15.2%. The benign microcalcifications were predominantly fibrocystic change (n = 42) whereas the malignant microcalcifications included ductal carcinoma in situ (n = 15) and invasive carcinoma (n = 1). Twenty-two patients underwent subsequent open surgical biopsy but no underestimation of disease was seen. Only two patients had vasovagal syncope and three others felt unwell during the biopsy. Nine patients had small haematomas, which resolved spontaneously. Vacuum-assisted biopsy carried out on an upright stereotactic mammography unit is a safe and effective method for evaluation of suspicious microcalcifications.

Source: MEDLINE

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62. Lesions of "uncertain malignant potential" diagnosed by vacuum-assisted breast biopsy: an unclear management?.

Author(s): Zografos G, Zagouri F, Sergentanis T, Nonni A, Koulocheri D, Patsouris E
63. Vacuum assisted stereotactic guided mammotome biopsies in the management of screen detected microcalcifications: experience of a large breast screening centre.

Author(s): Kumaroswamy V, Liston J, Shaaban AM

Citation: Journal of Clinical Pathology, June 2008, vol./is. 61/6(766-9), 0021-9746;1472-4146 (2008 Jun)

Publication Date: June 2008

Abstract: AIM: To evaluate the usefulness of vacuum assisted stereotactic guided mammotome biopsy in the diagnostic management of screen detected calcifications and to rationalise its use versus diagnostic excision. METHODS: The first 100 mammotome biopsies preceded by a conventional needle core biopsy (NCB) were identified from the database of Leeds/Wakefield Breast Screening Service. The histological diagnosis on NCB and mammotome were reviewed and compared with the surgical histological diagnosis if excision had been performed. RESULTS: Using mammotome, diagnoses were changed in 74 of the 100 cases. In 66 cases a definitive diagnosis (B2 or B5) was obtained. The incidence of inadequate/unsatisfactory (B1) biopsies was reduced from 36% to 9%. In 34 cases mammotome was not helpful in arriving at a definite diagnosis (B1/B3/B4). All cases diagnosed as malignant with mammotome were proven to have in situ or invasive malignancy on excision except for one case of ductal carcinoma in situ fully excised by mammotome. There was one false negative case of in-situ carcinoma with a prior benign (B2) mammotome diagnosis. Almost half the NCB uncertain (B3) cases required excision as the mammotome biopsies were also uncertain (B3). The majority were flat epithelial atypia and atypical intraductal proliferation. CONCLUSIONS: Mammotome biopsy is particularly useful for further assessment of an inadequate (B1) or suspicious (B4) NCB diagnosis. Diagnostic surgical excision remains the method of choice for managing atypical/uncertain lesions (B3).

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64. Minimizing underestimation rate of microcalcifications excised via vacuum-assisted breast biopsy: a blind study.


Citation: Breast Cancer Research & Treatment, May 2008, vol./is. 109/2(397-402), 0167-6806;0167-6806 (2008 May)

Publication Date: May 2008

Abstract: PURPOSE: The main disadvantage of Vacuum Assisted Breast Biopsy (VABB) is the probability of underestimating atypical ductal hyperplasia (ADH) and ductal carcinoma in situ (DCIS). This study evaluates a modified way of performing VABB. METHODS: 266 women with microcalcifications graded BI-RADS 3&4 underwent VABB (11G) on the Fischer's table. 133 women were allocated to the "standard" protocol and 24 cores were obtained (1 offset-main target and one additional offset). 133 women were randomly allocated to the "extended" protocol and 96 cores were excised (one offset-
A preoperative diagnosis was established, and the removed volume was calculated. When precursor or malignant lesions were diagnosed, open surgery was performed. A second pathologist, blind to the preoperative results and to the protocol made the postoperative diagnosis. The discrepancy between preoperative and postoperative diagnoses was evaluated.

RESULTS: When the standard protocol was applied, the underestimation rate for preoperative ADH, lobular neoplasia (LN), DCIS was 16.7%, 50% and 14.3% correspondingly. In the extended protocol, no underestimation was present in LN, ADH, but the underestimation rate for DCIS was 6.3%. In the extended protocol, no precursor/malignant tissue was left after VABB in all ADH cases, in 87.5% of LN cases, in 73.3% of DCIS, and in 50% of invasive carcinomas. The volume excised was 2.33 +/- 0.60 cc and 6.14 +/- 1.30 cc for the standard and the extended protocol, respectively. The rate of hematoma formation did not differ between the two protocols.

CONCLUSIONS: This recently introduced, "extended" way of performing VABB in microcalcifications safely minimizes the underestimation rate, which may lead to a modified management of ADH lesions.

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65. Lobular neoplasia at percutaneous breast biopsy: variables associated with carcinoma at surgical excision.

Author(s): Brem RF, Lechner MC, Jackman RJ, Rapelyea JA, Evans WP, Philpotts LE, Hargreaves J, Wasden S

Citation: AJR. American Journal of Roentgenology, March 2008, vol./is. 190/3(637-41), 0361-803X;1546-3141 (2008 Mar)

Publication Date: March 2008

Abstract: OBJECTIVE: The purpose of our study was to better define the rate and variables associated with cancer underestimation when lobular neoplasia is found at minimally invasive breast biopsy. MATERIALS AND METHODS: The records of 32,420 patients who underwent imaging-guided needle biopsy of the breast for mammographic or sonographic abnormalities from 1988 to 2000 were retrospectively reviewed. The 278 cases in which lobular neoplasia was the highest-risk lesion at biopsy were included. Of the 278 cases, 164 proceeded to surgical excision, allowing calculation of rates of underestimation from minimally invasive biopsy. RESULTS: Of the 32,420 minimally invasive breast biopsies, lobular neoplasia was found in 278 (0.9%). One hundred sixty-four of the 278 (59%) continued to surgical excision, where cancer was pathologically confirmed in 38 (23%). No difference was seen in the underestimation rates for lesions diagnosed as lobular carcinoma in situ (25%, 17 of 67 lesions) versus atypical lobular hyperplasia (22%, 21 of 97 lesions). Statistically significant underestimation of carcinoma was found with biopsy of masses (with or without associated microcalcifications) rather than calcifications only, a higher BI-RADS category (p < 0.0001), use of a core biopsy device rather than a vacuum device (p < 0.01), and obtaining fewer specimens (p < 0.0001). CONCLUSION: Significant sampling error occurs regardless of the type of core biopsy device, number of specimens obtained, histologic-radiographic concordance, mammographic appearance, and complete excision of the lesion as determined by imaging. For this reason, all patients with lobular neoplasia at core or vacuum-assisted biopsy should undergo surgical excision until further differentiating criteria can be determined.

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Available in fulltext at Lincoln County Hospital Professional Library; Note: Username:
66. **Atypical ductal hyperplasia: A way to minimize underestimation in vacuum-assisted breast biopsy?**

**Author(s):** Zagouri F., Sergentanis T.N., Koulocheri D., Nonni A., Bramis J., Zografos G.C.

**Citation:** Breast, February 2008, vol./is. 17/1(6), 0960-9776 (February 2008)

**Publication Date:** February 2008

**Source:** EMBASE

**Full Text:**

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67. **Stereotactic vacuum-assisted breast biopsy in 268 nonpalpable lesions**

[Italian;English] Biopsia mammaria in stereotassi, vacuum-assisted, in 268 lesioni non palpabili

**Author(s):** Tonegutti M., Girardi V.

**Citation:** Radiologia Medica, February 2008, vol./is. 113/1(65-75), 0033-8362 (February 2008)

**Publication Date:** February 2008

**Abstract:** Purpose. We evaluated the reliability of stereotactic vacuum-assisted breast biopsies (VAB) from our personal experience. Materials and methods. Between January 2003 and December 2005, 268 patients underwent VAB with an 11-gauge probe at our institution. Inclusion criteria were nonpalpable lesions, undetectable by ultrasound and suspected at mammography (microcalcifications, circumscribed mass, architectural distortion), for which cytology and/or core biopsy could not provide a definite diagnosis. Lesion mammographic patterns were microcalcifications in 186 cases (77.5%), mostly localised clusters (130/186: 70%); circumscribed mass with or without microcalcifications in 36 cases (15%) and architectural distortion with or without microcalcifications in 18 cases (7.5%). On the basis of the Breast Imaging Reporting and Data System (BI-RADS) classification, 16 cases (7%) were graded as highly suspicious for malignancy (BI-RADS 5), 81 (34%) as suspicious for malignancy (BI-RADS 4b), 97 (40%) as indeterminate (BI-RADS 4a) and 46 (19%) as probably benign (BI-RADS 3). Lesion size was <=10 mm in 161 cases (67%) and > 20 mm in only 38 cases (16%), 30 of which appeared as microcalcifications. Results. In 28/268 lesions (10.5%) the biopsy could not be performed (nonidentification of the lesion; inaccessibility due to location or breast size). In 12/240 (5%) biopsies, the sample was not representative. Pathology revealed 100/240 (42%) malignant or borderline lesions and 140/240 (58%) benign lesions. Among the malignant lesions, 16/100 (16%) were invasive carcinoma [infiltrating ductal carcinoma (IDC) or infiltrating lobular carcinoma (ILC)], 13/100 (13%) were microinvasive (T1mic), 35/100 (35%) were ductal carcinoma in situ (DCIS), 9/100 (9%) were lobular carcinoma in situ (CLIS). Among the borderline lesions, 27/100 (27%) were atypical epithelial hyperplasia [atypical ductal hyperplasia (ADH) or atypical lobular hyperplasia (ALH)]. In 9/100 surgically treated lesions (9%), there was discordance between the microhistological findings of VAB and the pathological results of the surgical procedure: 8/9 were underestimated by VAB [four ADH vs. DCIS, three DCIS vs. IDC, one ADH vs. IDC], and 1/9 was overestimated (T1mic vs. DCIS). Complications following VAB occurred in 9/240 patients (3.7%). Conclusions. In our experience, VAB showed fair reliability in the diagnosis of nonpalpable breast lesions despite a portion of failed (10.5%), nonsignificant (5%) procedures and underestimated lesions (9%). 2008 Springer-Verlag.

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68. **Atypical ductal hyperplasia: a way to minimize underestimation in vacuum-assisted breast biopsy?**

**Author(s):** Zografos GC, Zagouri F, Sergentanis TN, Nonni A, Koulocheri D, Bramis J
69. Stereotactic vacuum-assisted breast biopsy in 268 nonpalpable lesions.

Author(s): Tonegutti M, Girardi V

Citation: Radiologia Medica, February 2008, vol./is. 113/1(65-75), 0033-8362;0033-8362 (2008 Feb)

Publication Date: February 2008

Abstract: PURPOSE: We evaluated the reliability of stereotactic vacuum-assisted breast biopsies (VAB) from our personal experience.

MATERIALS AND METHODS: Between January 2003 and December 2005, 268 patients underwent VAB with an 11-gauge probe at our institution. Inclusion criteria were nonpalpable lesions, undetectable by ultrasound and suspected at mammography (microcalcifications, circumscribed mass, architectural distortion), for which cytology and/or core biopsy could not provide a definite diagnosis. Lesion mammographic patterns were microcalcifications in 186 cases (77.5%), mostly localised clusters (130/186: 70%); circumscribed mass with or without microcalcifications in 36 cases (15%) and architectural distortion with or without microcalcifications in 18 cases (7.5%). On the basis of the Breast Imaging Reporting and Data System (BI-RADS) classification, 16 cases (7%) were graded as highly suspicious for malignancy (BI-RADS 5), 81 (34%) as suspicious for malignancy (BI-RADS 4b), 97 (40%) as indeterminate (BI-RADS 4a) and 46 (19%) as probably benign (BI-RADS 3). Lesion size was 20 mm in only 38 cases (16%), 30 of which appeared as microcalcifications.

RESULTS: In 28/268 lesions (10.5%) the biopsy could not be performed (nonidentification of the lesion; inaccessibility due to location or breast size). In 12/240 (5%) biopsies, the sample was not representative. Pathology revealed 100/240 (42%) malignant or borderline lesions and 140/240 (58%) benign lesions. Among the malignant lesions, 16/100 (16%) were invasive carcinoma [infiltrating ductal carcinoma (IDC) or infiltrating lobular carcinoma (ILC)], 13/100 (13%) were microinvasive (T1mic), 35/100 (35%) were ductal carcinoma in situ (DCIS), 9/100 (9%) were lobular carcinoma in situ (CLIS). Among the borderline lesions, 27/100 (27%) were atypical epithelial hyperplasia [atypical ductal hyperplasia (ADH) or atypical lobular hyperplasia (ALH)]. In 9/100 surgically treated lesions (9%), there was discordance between the microhistological findings of VAB and the pathological results of the surgical procedure: 8/9 were underestimated by VAB (four ADH vs. DCIS, three DCIS vs. IDC, one ADH vs. IDC), and 1/9 was overestimated (T1mic vs. DCIS). Complications following VAB occurred in 9/240 patients (3.7%).

CONCLUSIONS: In our experience, VAB showed fair reliability in the diagnosis of nonpalpable breast lesions despite a portion of failed (10.5%), nonsignificant (5%) procedures and underestimated lesions (9%).

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70. Breast cancer diagnosis: the role of stereotactic vacuum-assisted aspiration biopsy.


Citation: International Journal Of Surgery, 2008, vol./is. 6 Suppl 1/(S104-8), 1743-9159;1743-9159 (2008)

Publication Date: 2008

Abstract: AIM: The aim of this study is to evaluate the diagnostic accuracy and impact of the stereotactic vacuum-assisted aspiration biopsy (VAB) as a surgical treatment for nonpalpable breast lesions.

METHODS: A retrospective analysis of the diagnostic and
therapeutic management of lesions having undergone VAB treatment was conducted. From February 2003 to September 2007, 525 stereotactic VABs were performed on 504 women using an 11-gauge needle device. Of these, 201 lesions were treated surgically. The concordance between VAB results and final pathology report after surgical excision was evaluated. Also examined was the impact of VAB on the quality of the surgical treatment.RESULTS: Stereotactic VABs performed with an 11-gauge device showed an underestimation rate of 23.8% for atypical ductal or lobular hyperplasia (AH). For ductal carcinoma in situ (DCIS) the underestimation rate was 31% and the underestimation rate for lobular carcinoma in situ (LCIS) was 14%. Only 38.2% of the patients with non-palpable lesions (201/525) were treated surgically and only 4% (20/504) of the patients underwent more than one surgical intervention. The VAB underestimation caused mistakes in the planning of the surgical therapy in only 9 out of 201 interventions (4.4%).CONCLUSIONS: This study confirms the efficacy of the VAB procedure in the diagnosis of non-palpable breast lesions and demonstrates its usefulness in therapeutic surgical planning. VAB treatment allows for the reduction of the number of surgical procedures required to diagnose and treat non-palpable breast lesions.

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71. Stereotactic breast biopsy: comparison of histologic underestimation rates with 11- and 9-gauge vacuum-assisted breast biopsy.

Author(s): Lourencio AP, Mainiero MB, Lazarus E, Giri D, Schepps B

Citation: AJR. American Journal of Roentgenology, November 2007, vol./is. 189/5(W275-9), 0361-803X;1546-3141 (2007 Nov)

Publication Date: November 2007

Abstract: OBJECTIVE: The purpose of this study was to compare histologic underestimations at stereotactic 11- and 9-gauge vacuum-assisted breast biopsy. MATERIALS AND METHODS: The reports of 1,223 consecutive stereotactic vacuum-assisted breast biopsies were retrospectively reviewed. An 11-gauge device was used to perform 828 and a 9-gauge device to perform 395 biopsies. The pathologic results were reviewed for all cases. Biopsy results of atypical ductal hyperplasia and ductal carcinoma in situ were compared with the pathologic results after surgical excision. Underestimation was defined as the need to upgrade atypical ductal hyperplasia to ductal carcinoma in situ or invasive carcinoma at surgery and to upgrade ductal carcinoma in situ to invasive carcinoma. Statistical significance was determined with the chi-square test and 95% CI. RESULTS: In the 11-gauge group, 12 (26%) of 46 cases of atypical ductal hyperplasia were upgraded to ductal carcinoma in situ and one (2%) of the cases to invasive carcinoma. In the 9-gauge group, six (22%) of 27 cases of atypical ductal hyperplasia were upgraded to ductal carcinoma in situ and two (7%) of the cases to invasive carcinoma. In the 11-gauge group, 35 (28.7%) of 122 cases of ductal carcinoma in situ were upgraded to invasive carcinoma. In the 9-gauge group, 10 (23%) of 44 cases of ductal carcinoma in situ were upgraded to invasive carcinoma. CONCLUSION: There was no statistically significant difference between 11-gauge biopsy and 9-gauge biopsy in underestimation of atypical ductal hyperplasia and ductal carcinoma in situ.

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72. Underestimation of atypical ductal hyperplasia at MRI-guided 9-gauge vacuum-assisted breast biopsy.

Author(s): Liberman L, Holland AE, Marjan D, Murray MP, Bartella L, Morris EA, Dershaw
OBJECTIVE: The purposes of this study were to determine the frequency of diagnosis of atypical ductal hyperplasia (ADH) at MRI-guided 9-gauge vacuum-assisted breast biopsy and to assess the rate of underestimation of ADH at subsequent surgical excision.

MATERIALS AND METHODS: We conducted a retrospective review of medical records of 237 lesions consecutively detected with MRI and then subjected to MRI-guided 9-gauge vacuum-assisted breast biopsy during a 33-month period. Underestimated ADH was defined as a lesion yielding ADH at vacuum-assisted biopsy and cancer at surgery. Scientific tables were used to calculate 95% CI.

RESULTS: Histologic analysis of MRI-guided vacuum-assisted breast biopsy specimens yielded ADH without cancer in 15 (6%) of 237 lesions. Among 15 patients in whom vacuum-assisted breast biopsy yielded ADH, the median age was 52 years (range, 46-68 years). The median number of specimens obtained was nine (range, 8-18 lesions). Median MRI lesion diameter was 1.3 cm (range, 0.7-7.0 cm). Among 15 MRI lesions, 10 (67%) were nonmasslike enhancement and five (33%) were masses. Surgical excision was performed on 13 lesions. Surgical histologic findings were malignancy in five (38%) of the cases, all ductal carcinoma in situ; high-risk lesion in six (46%) of the cases, including ADH without other high-risk lesions (n = 2), ADH and lobular carcinoma in situ (LCIS) (n = 1), ADH, LCIS, and papilloma (n = 1), ADH and papilloma (n = 1), and LCIS (n = 1); and benign in two (15%) of the cases. These data indicated an ADH underestimation rate of 38% (95% CI, 14-68%).

CONCLUSION: ADH without cancer was encountered in 6% of MRI-guided 9-gauge vacuum-assisted breast biopsies. ADH at MRI-guided vacuum-assisted breast biopsy is an indication for surgical excision because of the high (38%) frequency of underestimation of these lesions.

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73. Imprint cytology on microcalcifications excised by vacuum-assisted breast biopsy: a rapid preliminary diagnosis


Citation: World journal of surgical oncology, 2007, vol./is. 5((40), 1477-7819 (2007)

Publication Date: 2007

Abstract: BACKGROUND: To evaluate imprint cytology in the context of specimens with microcalcifications derived from Vacuum-Assisted Breast Biopsy (VABB). PATIENTS AND METHODS: A total of 93 women with microcalcifications BI-RADS 3 and 4 underwent VABB and imprint samples were examined. VABB was performed on Fischer's table using 11-gauge Mammatome vacuum probes. A mammogram of the cores after the procedure confirmed the excision of microcalcifications. For the application of imprint cytology, the cores with microcalcifications confirmed by mammogram were gently rolled against glass microscope slides and thus imprint smears were made. For rapid preliminary diagnosis Diff-Quick stain, modified Papanicolaou stain and May Grunwald Giemsa were used. Afterwards, the core was dipped into a CytoRich Red Collection fluid for a few seconds in order to obtain samples with the use of the specimen wash. After the completion of cytological procedures, the core was prepared for routine histological study. The pathologist was blind to the preliminary cytological results. The cytological and pathological diagnoses were comparatively evaluated. RESULTS: According to the pathological examination, 73 lesions were benign, 15 lesions were carcinomas (12 ductal carcinomas in situ, 3 invasive ductal carcinomas), and 5 lesions were precursor: 3 cases of atypical ductal hyperplasia (ADH) and 2 cases of lobular neoplasia (LN). The observed sensitivity and
specificity of the cytological imprints for cancer were 100% (one-sided, 97.5% CI: 78.2%-100%). Only one case of ADH could be detected by imprint cytology. Neither of the two LN cases was detected by the imprints. The imprints were uninformative in 11 out of 93 cases (11.8%). There was no uninformative case among women with malignancy. CONCLUSION: Imprint cytology provides a rapid, accurate preliminary diagnosis in a few minutes. This method might contribute to the diagnosis of early breast cancer and possibly attenuates patients' anxiety.

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74. Vacuum-assisted breast biopsy: the value and limitations of cores with microcalcifications.
Citation: Pathology, Research & Practice, 2007, vol./is. 203/8(563-6), 0344-0338;1618-0631 (2007)
Publication Date: 2007
Abstract: The aim of this study was to assess cores with microcalcifications (CM) and without microcalcifications (CWM) obtained from vacuum-assisted breast biopsy (VABB). The study included 12 atypical ductal hyperplasias (ADH), 37 ductal carcinomas in situ (DCIS), and seven invasive ductal carcinomas (IDC) diagnosed by VABB (11G) on the Fischer's table. More than 24 cores were excised. For CM/CWM, a separate pathology report was given. Open surgery followed, and underestimation was calculated. The CM/CWM discrepancy was evaluated (superiority, identity, and inferiority). CWM failed to make the diagnosis in 8.3% and 35.1% of ADH and DCIS, respectively. In 28.6% of IDC, diagnosis was made through CWM. CM was superior in DCIS/ADH diagnosis. However, CWM may be valuable for the diagnosis of the invasive component.

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75. Is zero underestimation feasible? Extended Vacuum-Assisted Breast Biopsy in solid lesions - a blind study.
Citation: World Journal of Surgical Oncology, 2007, vol./is. 5/(53), 1477-7819;1477-7819 (2007)
Publication Date: 2007
Abstract: BACKGROUND: Vacuum-Assisted Breast Biopsy (VABB) is effective for the preoperative diagnosis of non-palpable mammographic solid lesions. The main disadvantage is underestimation, which might render the management of atypical ductal hyperplasia (ADH), and ductal carcinoma in situ (DCIS) difficult. This study aims to develop and assess a modified way of performing VABB.PATIENTS AND METHODS: A total of 107 women with non-palpable mammographic breast solid tumors BI-RADS 3 and 4 underwent VABB with 11G, on the stereotactic Fischer's table. 54 women were allocated to the recommended protocol and 24 cores were obtained according to the consensus meeting in Nordesterdt (1 offset-main target in the middle of the lesion and one offset
inside). 53 women were randomly allocated to the extended protocol and 96 cores were excised (one offset-main target in the middle of the lesion and 7 peripheral offsets). A preoperative diagnosis was established. Women with a preoperative diagnosis of precursor/preinvasive/invasive lesion underwent open surgery. A second pathologist, blind to the preoperative results and to the protocol made the postoperative diagnosis. The percentage of the surface excised via VABB was retrospectively calculated on the mammogram. The discrepancy between preoperative and postoperative diagnoses along with the protocol adopted and the volume removed were evaluated by Fisher’s exact test and Mann-Whitney-Wilcoxon test, respectively.

RESULTS: Irrespectively of the protocol adopted, 82.2% of the lesions were benign. 14.0% of the lesions were malignancies (5.1% of BI-RADS 3, 5.3% of BI-RADS 4A, 25% of BI-RADS 4B, and 83.3% of BI-RADS 4C lesions). 3.7% of the biopsies were precursor lesions. There was no evidence of underestimation in either protocols. In the standard protocol, the preoperative/postoperative diagnoses were identical. In the extended protocol, the postoperative diagnosis was less severe than the preoperative in 55.5% of cases (55.5% vs. 0%, p = 0.029), and preoperative ADH was totally removed. The phenomenon of discrepancy between diagnoses was associated with larger volume removed (8.20 +/- 1.10 vs. 3.32 +/- 3.50 cm³, p = 0.037) and higher removed percentage of the lesion (97.83 +/- 4.86% vs. 74.34 +/- 23.43%, p = 0.024)

CONCLUSION: The extended protocol seems to totally excise precursor lesions, with minimal underestimation. This might possibly point to a modified management of ADH lesions.

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76. Secondary breast lymphoma diagnosed by vacuum-assisted breast biopsy: a case report.


Citation: Journal of Medical Case Reports [Electronic Resource], 2007, vol./is. 1/(113), 1752-1947;1752-1947 (2007)

Publication Date: 2007

Abstract: INTRODUCTION: Breast lymphoma, either as a manifestation of primary extranodal disease or as secondary involvement, is a rare malignancy, and its diagnosis, prognosis, and treatment have not been clearly defined. On the other hand, Vacuum-assisted breast biopsy (VABB) is a minimally invasive technique with ever-growing use for the diagnosis of mammographically detected, non-palpable breast lesions. CASE PRESENTATION: A symptom-free, 56-year-old woman presented with a non-palpable BI-RADS 4B lesion without microcalcifications. She had a positive family history for breast cancer and a history of atypical ductal hyperplasia in the ipsilateral breast four years ago. She reported having been treated for non-Hodgkin lymphoma 12 years ago. With the suspicion of breast cancer, mammographically guided VABB with 11-gauge probe (on the stereotactic Fisher's table) was performed. VABB made the diagnosis of a non-Hodgkin, grade II, B-cell germinal-center lymphoma. VABB yielded enough tissue for immunohistochemistry/WHO classification. CONCLUSION: This is the first case in the literature demonstrating the successful diagnosis of breast lymphoma by VABB, irrespectively of the level of clinical suspicion. It should be stressed that VABB was able to yield enough tissue for WHO classification. In general, lymphoma should never be omitted in the differential diagnosis, since no pathognomonic radiologic findings exist for its diagnosis.

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Diagnosis of flat epithelial atypia (FEA) after stereotactic vacuum-assisted biopsy (VAB) of the breast: What is the best management: Systematic surgery for all or follow-up? [French] Lesions de metaplasie cylindriques atypiques (MCA) diagnostiquées par macrobiopsies assistées par aspiration: Opportunite d'une exerese chirurgicale?

Author(s): David N., Labbe-Devilliers C., Moreau D., Loussouarn D., Campion L.

Citation: Journal de Radiologie, November 2006, vol./is. 87/11 Pt 1(1671-1677), 0221-0363 (2006 Nov)

Abstract: Objective. FEA lesions group two histological types: columnar cell hyperplasia with atypia (CCHA) and columnar cell change with atypia (CCA). The increasing use of VAB has resulted in increased detection of isolated FEA lesions. The aim of this study was to define the best management possible for these patients: which cases may not need excision? Material and methods. From our database of 780 VABs carried out from 2000 to 2004, 59 patients with FEA were diagnosed. Cases in which no surgery was performed or all features were not available were excluded, thus excluding 19 cases. Forty patients with FEA were included. We reviewed clinical and mammographic characteristics, histological biopsy, and the corresponding surgically excised tissue features. Results. VAB yielded 25 cases of CCHA and 15 cases of CCA. Surgery revealed seven ductal carcinoma cases (four invasive, three in situ); nine benign lesions, and 24 with atypia (19 FEA and six atypical ductal hyperplasia). We found two features related to the risk of cancer: the presence and the size of hyperplasia. All carcinomas were found within the CCHA lesions. No cancer was yielded when size was less than 10 mm within CCA lesions and lesions that were totally removed. Conclusion. We recommend surgical excision when CCHA greater than 10 mm is found on the VAB or it is incompletely removed. CCA lesions or CCHA less than 10 mm or totally removed may obviate systematic surgery. Editions Francaises de Radiologie, 2006. Edite par Elsevier Masson SAS.

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Diagnosis of flat epithelial atypia (FEA) after stereotactic vacuum-assisted biopsy (VAB) of the breast: What is the best management: systematic surgery for all or follow-up? [French] Lesions de metaplasie cylindriques atypiques (MCA) diagnostiquées par macrobiopsies assistées par aspiration: Opportunite d'une exerese chirurgicale?

Author(s): David N, Labbe-Devilliers C, Moreau D, Loussouarn D, Campion L

Citation: Journal de Radiologie, November 2006, vol./is. 87/11 Pt 1(1671-7), 0221-0363:0221-0363 (2006 Nov)

Publication Date: November 2006

Abstract: OBJECTIVE: FEA lesions group two histological types: columnar cell hyperplasia with atypia (CCHA) and columnar cell change with atypia (CCA). The increasing use of VAB has resulted in increased detection of isolated FEA lesions. The aim of this study was to define the best management possible for these patients: which cases may not need excision? MATERIAL AND METHODS: From our database of 780 VABs carried out from 2000 to 2004, 59 patients with FEA were diagnosed. Cases in which no surgery was performed or all features were not available were excluded, thus excluding 19 cases. Forty patients with FEA were included. We reviewed clinical and mammographic characteristics, histological biopsy, and the corresponding surgically excised tissue features. RESULTS: VAB yielded 25 cases of CCHA and 15 cases of CCA. Surgery revealed seven ductal carcinoma cases (four invasive, three in situ); nine benign lesions, and 24 with atypia (19 FEA and six atypical ductal hyperplasia). We found two features related to the risk of cancer: the presence and the size of hyperplasia. All carcinomas were found within the CCHA lesions. No cancer was yielded when size was less than 10 mm within CCA lesions and lesions that were totally removed. CONCLUSION: We recommend...
surgical excision when CCHA greater than 10 mm is found on the VAB or it is incompletely removed. CCA lesions or CCHA less than 10 mm or totally removed may obviate systematic surgery.

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79. Lobular neoplasia at 11-gauge vacuum-assisted stereotactic biopsy: correlation with surgical excisional biopsy and mammographic follow-up.

Author(s): Mahoney MC, Robinson-Smith TM, Shaughnessy EA

Citation: AJR. American Journal of Roentgenology, October 2006, vol./is. 187/4(949-54), 0361-803X;1546-3141 (2006 Oct)

Publication Date: October 2006

Abstract: OBJECTIVE: The objective of our study was to evaluate the outcome of lobular neoplasia diagnosed at 11-gauge stereotactic vacuum-assisted biopsy (SVAB). MATERIALS AND METHODS: Retrospective review of 1,819 lesions sampled with 11-gauge SVAB yielded 27 patients with lobular neoplasia as the most severe pathologic entity diagnosed. Patients with lobular neoplasia associated with atypical ductal hyperplasia (ADH), ductal carcinoma in situ (DCIS), or infiltrating carcinoma were excluded. Twenty patients underwent surgical excisional biopsy, and seven patients were followed mammographically for a mean of 52 months (range, 14-67 months). Mammographic lesion type, number of specimens obtained per lesion, and specific histologic features related to lobular carcinoma in situ (LCIS) were assessed. Results were compared with histologic findings at surgery or mammographic follow-up. RESULTS: Nineteen lesions presented mammographically as microcalcifications, four as masses, three as masses with associated microcalcifications, and one as architectural distortion. A mean of 13 specimens were obtained per lesion. Carcinoma was found at surgical excision in 19% of the lesions (5/27). Lesions were upgraded to DCIS (n = 2), invasive lobular carcinoma (n = 2), and mixed invasive ductal and lobular carcinoma (n = 1). In addition to the diagnosis of lobular neoplasia at SVAB, one patient presented with synchronous infiltrating ductal carcinoma in the contralateral breast, and two patients developed metachronous infiltrating ductal carcinoma in a different quadrant of the ipsilateral breast. Twelve of the 27 lesions included LCIS. These lesions were evaluated pathologically to distinguish the classic (10/12) from the pleomorphic (2/12) form of this entity. Ten of the 12 LCIS cases underwent surgical excisional biopsy with four of the five upgrades occurring in these patients. Only one of these patients was shown to have the pleomorphic type of LCIS. Lesions in seven patients who underwent mammographic follow-up remained stable. CONCLUSION: The known association of lobular neoplasia with high-risk and malignant lesions at surgical biopsy requires careful consideration when lobular neoplasia is diagnosed as the most severe histologic entity at SVAB. The diagnosis of lobular neoplasia at 11-gauge SVAB is not reliable in view of the 19% upgrade rate at the time of surgical excisional biopsy in our study. No predictive mammographic features allowed distinction between the patients with lesions that were upgraded at the time of surgery from those whose lesions were not upgraded.

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80. [Stereotactic biopsy for non-palpable breast lesions: evaluation and choice of minimal invasive and excisional biopsy].

Author(s): Liu GY, Chen CM, Hu Z, Ling H, Shen KW, Shen ZZ, Shao ZM

Citation: Chung-Hua Wai Ko Tsa Chih [Chinese Journal of Surgery], October 2006, vol./is.
OBJECTIVE: To evaluate three biopsy methods which are currently used in stereotactic breast biopsy.

METHODS: A total of 361 cases of stereotactic breast biopsies were carried out since 2000, including 73 cases of true cut core needle biopsies (ST-CN), 74 cases of vacuum assisted biopsies (ST-VAB) and 214 cases of excisional biopsies. After medium follow-up time of 18 months (6 to 66 months), the accuracy as well as the clinical benefits of the three stereotactic biopsy procedures were analyzed retrospectively.

RESULTS: The cancer miss rate of stereotactic wire localized excisional biopsy, ST-CN and ST-VAB is 0, 2.7% and 0 respectively. Under-estimate rate of minimal invasive biopsy was 33% in atypical ductal hyperplasia (ADH) and 53% in ductal carcinoma in situ (DCIS). The minimal invasive procedure is superior to surgical procedure in terms of operation time, breast cosmetic outcome and complications, etc. Furthermore, 69% of the surgeries for suspicious lesion were waived.

CONCLUSIONS: Stereotactic minimal invasive breast biopsy, especially ST-VAB, is an accurate, safe and convenient diagnostic technique and could be considered as the first line choice for mammographic moderate suspicious breast lesions (BIRADS-4). However, further excisional biopsy is recommended for atypical hyperplasia. Stereotactic excisional biopsy could be directly used for diagnosis of mammographic highly suspicious breast lesions (BIRADS-5).

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81. Percutaneous excisional biopsy of palpable breast masses under ultrasound visualization.

Author(s): Vargas HI, Vargas MP, Gonzalez K, Burla M, Khalkhali I

Citation: Breast Journal, September 2006, vol./is. 12/5 Suppl 2(S218-22), 1075-122X;1075-122X (2006 Sep-Oct)

Publication Date: September 2006

Abstract: A palpable breast mass is a common reason for surgical consultation. Our goal was to determine whether ultrasound-guided vacuum-assisted core biopsy (US-VACB) is safe and effective in completely removing presumed benign palpable breast masses. We conducted a cohort study of 201 consecutive patients with presumed benign palpable masses who underwent removal with US-VACB. The main outcome measured was the successful removal of palpable masses. Palpable masses were successfully removed with US-VACB in 99% of cases; 2% were cancer and 7.5% were atypical ductal hyperplasia or phyllodes tumor. Two clinical recurrences representing a seroma were seen on follow-up. US-VACB is safe and effective in the initial diagnosis and management of presumed benign palpable breast masses. It provides the benefits of percutaneous biopsy and the palpable abnormality no longer remains.

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82. Comparison of the diagnostic accuracy of a vacuum-assisted percutaneous intact specimen sampling device to a vacuum-assisted core needle sampling device for breast biopsy: initial experience.

Author(s): Killebrew LK, Oneson RH

Citation: Breast Journal, July 2006, vol./is. 12/4(302-8), 1075-122X;1075-122X (2006 Jul-Aug)

Publication Date: July 2006
Abstract: The objective of this research was to determine whether biopsy of the breast using a percutaneous intact specimen sampling device influences the underestimation rate of ductal carcinoma in situ (DCIS) compared to a vacuum-assisted core needle biopsy (VACNB) device. This study was a retrospective comparison of two series of 800 consecutive patients that underwent stereotactic biopsy of the breast for mammographic lesions presenting as microcalcifications classified by our institution as Breast Imaging Reporting and Data System (BI-RADS) 4 or 5. In the first series of patients (n = 800), a VACNB device was used; in the second series (n = 800), a vacuum-assisted percutaneous intact specimen biopsy (VAPIB) device was used. Initial diagnoses were made from the histopathologic examination of the tissue retrieved at biopsy. Lesions presenting as DCIS or atypical ductal hyperplasia (ADH) after percutaneous biopsy were then compared to the histopathologic analysis of specimens retrieved at surgical biopsy. DCIS upgrades were defined as cases in which the diagnosis of the stereotactic biopsy was DCIS and the diagnosis of the subsequent surgical excision was infiltrating ductal carcinoma (IDC). ADH upgrades were defined as cases in which the diagnosis of the stereotactic biopsy specimen was ADH and the diagnosis of the surgical excision was DCIS, lobular carcinoma in situ (LCIS), or IDC. The lesions retrieved by both biopsy techniques yielded a similar pathology distribution. Underestimation of DCIS occurred less frequently (p = 0.06) in the biopsy samples taken using the intact biopsy device (1/31, 3.2%) as compared to biopsy samples taken using the core needle biopsy device (7/36, 19.4%). No significant adverse events were reported. Breast biopsy can be performed safely and accurately using a vacuum-assisted percutaneous intact specimen sampling device. In this study, such a device trended toward fewer underestimations of DCIS at biopsy compared to the vacuum-assisted core needle sampling biopsy method.

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83. Atypical ductal hyperplasia of the breast: the controversial management of a borderline lesion: experience of 47 cases diagnosed at vacuum-assisted biopsy.

Author(s): Bedei L, Falcini F, Sanna PA, Casadei Giunchi D, Innocenti MP, Vignutelli P, Saragoni L, Folli S, Amadori D

Citation: Breast, April 2006, vol./is. 15/2(196-202), 0960-9776;0960-9776 (2006 Apr)

Publication Date: April 2006

Abstract: The present paper describes our experience of 47 cases of atypical ductal hyperplasia (ADH) diagnosed at vacuum-assisted biopsy. From June 1999 to December 2003, 47 consecutive diagnoses of non-palpable ADH of the breast were made by 11-gauge vacuum-assisted biopsy (Mammotome). Of these, 17 were subjected to surgical excision and 11 underwent a second Mammotome at the site of the previous vacuum-assisted biopsy. Diagnostic underestimation occurred in only two cases, with a surgical diagnosis of ductal carcinoma in situ. In both patients, aged between 46 and 55 years, the radiological images showed microcalcifications of >20 mm, and the lesions were not completely removed by Mammotome. Despite the obvious limitations of the present study, it can be concluded that the probability of underestimating ADH diagnosis by Mammotome appears to be related to the radiological features of the lesion (>20 mm) and to the adequacy of specimens.

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84. Vacuum-assisted core biopsy (Mammotome) for the diagnosis of non-palpable breast lesions: four-year experience in an Italian center.
Author(s): Costantini R, Sardellone A, Marino C, Giamberardino MA, Innocenti P, Napolitano AM

Citation: Tumori, July 2005, vol./is. 91/4(351-4), 0300-8916;0300-8916 (2005 Jul-Aug)

Publication Date: July 2005

Abstract: AIMS AND BACKGROUND: Microinvasive biopsy techniques are increasingly employed in the diagnostic assessment of non-palpable breast lesions (NPBLs). This study reports the four-year experience of an Italian surgical center in the evaluation of the diagnostic effectiveness versus adverse effects of vacuum-assisted core biopsy (Mammotome). METHODS: 314 NPBLs with a dubious ultrasound and/or radiographic appearance were subjected to mammography-guided (86) or ultrasound-guided (228) Mammotome biopsy. RESULTS: The procedure could be completed and was diagnostic in 305 cases (P < 0.0001). Adverse events were transient light-headedness. In two cases and moderate bleeding in three cases. Histological processing of the biopsies showed 227 cases of benign disease (74.42%), 68 cases of carcinoma (20 carcinomas in situ and 48 infiltrating carcinomas) (22.29%), nine cases of atypical ductal hyperplasia (2.95%) and one atypical lobular hyperplasia (0.33%). Only 12 patients reported mild discomfort relative to the procedure. The difference between the number of patients reporting discomfort and that of patients reporting no discomfort at all was highly significant (P < 0.0001). CONCLUSIONS: The results confirm that Mammotome biopsy is a highly effective procedure for the diagnosis of NPBLs, with minimal negative effects.

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85. Ultrasound-guided, vacuum-assisted, percutaneous excision of breast lesions: an accurate technique in the diagnosis of atypical ductal hyperplasia.

Author(s): Grady I, Gorsuch H, Wilburn-Bailey S

Citation: Journal of the American College of Surgeons, July 2005, vol./is. 201/1(14-7), 1072-7515;1072-7515 (2005 Jul)

Publication Date: July 2005

Abstract: BACKGROUND: In October 2002, ultrasound-guided, vacuum-assisted, percutaneous excision was shown to facilitate the complete removal of benign breast lesions up to 3 cm in diameter. This study was performed to ascertain the overall accuracy of ultrasound-guided, vacuum-assisted, percutaneous excision as evidenced by the frequency of atypical ductal hyperplasia (ADH) underestimation. STUDY DESIGN: A retrospective review was conducted of 542 consecutive ultrasound-guided, vacuum-assisted breast biopsies performed between February 2000 and September 2004. Before July 2002, no attempt was made to completely remove all imaged lesion evidence. After July 2002, all patients underwent complete percutaneous excision of all imaged lesion evidence. Pathology review revealed 52 lesions that demonstrated ADH and no evidence of malignancy. Each patient with this diagnosis was offered surgical excision. Pathologic reports for each group were compared with the subsequent open surgical specimens. RESULTS: Of 542 consecutively diagnosed lesions, 52 displayed ADH with no evidence of malignancy (10%). Five patients refused operation. Of the 47 patients who underwent open excision, 6 (13%) were found to have malignancies. The rate of ADH underestimation was 6 of 18 (33%) in incisional biopsies and 0 of 29 performed with complete imaged lesion evidence (p=0.002). The rate of ADH underestimation in women who underwent ultrasound-guided, vacuum-assisted, percutaneous excision was zero, a result equivalent to open surgical biopsy. CONCLUSIONS: ADH is a more common finding in sonographic lesions than has been previously reported. Complete ultrasound-guided, vacuum-assisted, percutaneous excision is more accurate than nonexcisional ultrasound-guided biopsy. Patients so diagnosed have very low underestimation rates and may not require open surgical reexcision.

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86. Clinical experience with MRI-guided vacuum-assisted breast biopsy.

Author(s): Lehman CD, Deperi ER, Peacock S, McDonough MD, Demartini WB, Shook J

Citation: AJR. American Journal of Roentgenology, June 2005, vol./is. 184/6(1782-7), 0361-803X;0361-803X (2005 Jun)

Publication Date: June 2005

Abstract: OBJECTIVE: The objective of our study was to evaluate a new commercially available method of MRI-guided vacuum-assisted breast biopsy using an open coil and a closed 1.5-T scanner. MATERIALS AND METHODS: Consecutive MRI-guided vacuum-assisted breast biopsies of 38 lesions in 28 women performed between May and September 2003 at two practice sites in the United States were retrospectively reviewed. Lesion characteristics including size, morphology, and enhancement were recorded. Times to perform each procedure, defined as the time from the start of the first localizing scan to the final scan after biopsy, were recorded. Histologic results for all lesions were obtained, and surgical, imaging, or clinical follow-up was performed. RESULTS: Enhancing masses and foci ranged from 2.5 to 19 mm. Nonmasslike enhancements ranged from 6 to 70 mm. All 38 biopsies (100%) were technically successful, and no complications were associated with any of the biopsy procedures. The average time to perform the 19 single-site MRI-guided procedures was 38 min (range, 23-57 min). The 11 multiple-site biopsies performed in a single breast averaged 59 min (range, 51-68 min), and eight bilateral biopsies averaged 64 min (range, 46-80 min). Histologic results from vacuum-assisted breast biopsy revealed malignancy in 14 lesions (37%), atypical ductal hyperplasia in two lesions (5%), and benign findings in 22 lesions (58%). One of two lesions with atypical ductal hyperplasia was upgraded to ductal carcinoma in situ after surgery, for an overall cancer yield of 40% (15/38). CONCLUSION: This new method of MRI-guided vacuum-assisted breast biopsy is a safe, effective, and time-efficient means of MRI-guided tissue sampling.

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87. Can US-guided vacuum-assisted biopsies be an alternative to diagnostic surgery in cases of non-diagnostic core needle biopsy? [French] Les macrobiopsies echo guidees assistees par le vide peuvent-elles constituer une alternative a la chirurgie diagnostique en cas de microbiopsies non contributives?

Author(s): Carpentier E., Maruani A., Michenet P., Bonneau C., Degand P., Lebas P.

Citation: Journal de radiologie, May 2005, vol./is. 86/5 Pt 1(475-480), 0221-0363 (May 2005)

Publication Date: May 2005

Abstract: PURPOSE: To assess US-guided vacuum-assisted biopsies in the diagnosis of suspicious sonographic breast lesions after non-diagnostic core needle biopsies (CNB). PATIENTS AND METHODS: Retrospective study of 42 females with suspicious breast lesions at US. CNB previously performed were non-diagnostic. Because of the larger sample size, vacuum-assisted biopsies were performed, instead of surgical biopsy. RESULTS: Vacuum-assisted biopsies showed 32 benign lesions. Histologic examination of the CNB showed non-specific fibrous tissue in 43% of cases as opposed to 7.1% for vacuum-assisted biopsies. The latter provided a more specific diagnosis (mainly fibrocystic breast disease). From a total of 4 lesions that were suspicious at CNB, 3 were diagnosed as malignancies after vacuum-assisted biopsy and one case was a “borderline” lesion. Three additional malignant and three additional borderline lesions were diagnosed on vacuum-assisted biopsies. In 11 cases, surgical excision was performed, and all diagnoses
from vacuum-assisted biopsies were confirmed at microscopy, except in one case where it was underestimated (ADH versus DCIS). CONCLUSION: US-guided vacuum-assisted biopsy is a reliable technique. Because it provides more tissue than CNB, it can be an alternative to diagnostic surgery after non-diagnostic CNB. Indeed, it allows confirmation of the diagnosis and provides a more specific diagnosis of benign lesions. With regards to malignant and borderline lesions, it avoids the risk of false-negative CNB and overlooking carcinomas.

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88. Sonographically guided core biopsy of the breast: comparison of 14-gauge automated gun and 11-gauge directional vacuum-assisted biopsy methods.

Author(s): Cho N, Moon WK, Cha JH, Kim SM, Kim SJ, Lee SH, Chung HK, Cho KS, Park IA, Noh DY

Citation: Korean Journal of Radiology, April 2005, vol./is. 6/2(102-9), 1229-6929;1229-6929 (2005 Apr-Jun)

Publication Date: April 2005

Abstract: OBJECTIVE: To compare the outcomes of 14-gauge automated biopsy and 11-gauge vacuum-assisted biopsy for the sonographically guided core biopsies of breast lesions.MATERIALS AND METHODS: We retrospectively reviewed all sonographically guided core biopsies performed from January 2002 to February 2004. The sonographically guided core biopsies were performed with using a 14-gauge automated gun on 562 breast lesions or with using an 11-gauge vacuum-assisted device on 417 lesions. The histologic findings were compared with the surgical, imaging and follow-up findings. The histologic underestimation rate, the repeat biopsy rate and the false negative rates were compared between the two groups.RESULTS: A repeat biopsy was performed on 49 benign lesions because of the core biopsy results of the high-risk lesions (n = 24), the imaging-histologic discordance (n = 5), and the imaging findings showing disease progression (n = 20). The total underestimation rates, according to the biopsy device, were 55% (12/22) for the 14-gauge automated gun biopsies and 36% (8/22) for the 11-gauge vacuum-assisted device (p = 0.226). The atypical ductal hyperplasia (ADH) underestimation (i.e., atypical ductal hyperplasia at core biopsy and carcinoma at surgery) was 58% (7/12) for the 14-gauge automated gun biopsies and 20% (1/5) for the 11-gauge vacuum-assisted biopsies. The ductal carcinoma in situ (DCIS) underestimation rate (i.e., ductal carcinoma in situ upon core biopsy and invasive carcinoma found at surgery) was 50% (5/10) for the 14-gauge automated gun biopsies and 41% (7/17) for the 11-gauge vacuum-assisted biopsies. The repeat biopsy rates were 6% (33/562) for the 14-gauge automated gun biopsies and 3.5% (16/417) for the 11-gauge vacuum-assisted biopsies. Only 5 (0.5%) of the 979 core biopsies were believed to have missed the malignant lesions. The false-negative rate was 3% (4 of 128 cancers) for the 14-gauge automated gun biopsies and 1% (1 of 69 cancers) for the 11-gauge vacuum-assisted biopsies.CONCLUSION: The outcomes of the sonographically guided core biopsies performed with the 11-gauge vacuum-assisted device were better than those outcomes of the biopsies performed with the 14-gauge automated gun in terms of underestimation, rebiopsy and the false negative rate, although these differences were not statistically significant.

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89. Stereotactic 11-gauge vacuum-assisted breast biopsy: influence of number of specimens on diagnostic accuracy.

Author(s): Lomoschitz FM, Helbich TH, Rudas M, Pfarrl G, Linnau KF, Stadler A, Jackman RJ
PURPOSE: To determine whether number of specimens obtained at stereotactic 11-gauge vacuum-assisted breast biopsy with the patient prone influences diagnostic accuracy and to determine whether this number varies depending on mammographic appearance of lesions as masses or microcalcifications.

MATERIALS AND METHODS: Biopsy was prospectively performed in 100 patients (median age, 55 years; range, 31-81 years) with 100 lesions that were mammographically evident as masses (n = 50) and microcalcifications (n = 50) with standardized protocol to acquire 20 specimens per lesion in three 360 degrees probe rotations at one skin entry site. Specimens were histologically evaluated sequentially, and findings were compared with results of surgical excision or of mammographic follow-up for at least 24 months. Differences in diagnostic yield after each probe rotation and differences in diagnostic yield between masses and microcalcifications were determined with chi(2) test.

RESULTS: Up to 12 specimens harvested within two 360 degrees probe rotations were necessary to yield correct diagnosis in 96% of patients with masses and 92% of patients with microcalcifications. Diagnostic yield was not improved with more than 12 specimens for masses or microcalcifications. In two (4%) of 47 patients with lesions that were eventually diagnosed as cancer, results at stereotactic biopsy indicated they were benign. Underestimation of diagnosis of lesions as atypical ductal hyperplasia and ductal carcinoma in situ occurred in two (50%) of four and two (17%) of 12 lesions, respectively. With 20 specimens harvested during three probe rotations, there was no statistically significant difference in diagnostic yield between patients with masses and those with microcalcifications (P = .68).

CONCLUSION: At 11-gauge vacuum-assisted biopsy, highest diagnostic yield was achieved with 12 specimens per lesion, independent of mammographic appearance of the lesion. Even with standardized retrieval of 20 specimens per lesion, underestimation of disease still occurs.

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90. Underestimation of breast carcinoma with 11-gauge stereotactically guided directional vacuum-assisted biopsy [French] Sous-estimation du cancer du sein par les macrobiopsies stereotaxiques 11-gauge assistees par le vide

Author(s): Plantade R., Hammou J.C., Fighiera M., Aubanel D., Scotto A., Gueret S.

Citation: Journal de Radiologie, April 2004, vol./is. 85/4 I(391-401), 0221-0363 (April 2004)

Publication Date: April 2004

Abstract: Purpose. To assess the reliability of vacuum-assisted biopsy in diagnosing and managing atypical ductal hyperplasia and ductal carcinoma in situ of the breast. Materials and Method. Retrospective review of 2130 stereotactic large-core biopsies in 1638 patients over a 40 month period (January 2000 to May 2003) using the mammothome 11-gauge and a dedicated Fischer table. A total of 135 cases of atypical ductal hyperplasia and 322 cases of ductal carcinoma in situ were diagnosed. The average number of cores was 18 (5-64). Surgical resection was systematic for carcinomas and selective for atypical ductal hyperplasia. Correlation with surgical findings (n:356) or mammographic follow-up (n:98) is presented. The influence of various factors on the risk of underestimation was analyzed. Results. Resection revealed an underestimation of 10/37 (27%) for atypical ductal hyperplasia. It was lower (9%) when the radiological lesion had completely disappeared. Underestimation of ductal carcinoma in situ was 12/319 (3.8%). It was higher for masses, high-grade lesions or with micro-infiltration, or in the case where the peripheral edge was affected. Of the 98 atypical ductal hyperplasia that were not surgically biopsied, 81 were monitored at 9-42 months (average: 29 months). Sixteen underwent repeat biopsy: two infiltrating lobular carcinomas were detected in the same area. Conclusion.
Underestimation of atypical ductal hyperplasia was high, justifying systematic surgical resection. Underestimation of ductal carcinoma in situ and its practical consequences are not significant with the extension of sentinel lymphadenectomy to the wide high-grade lesions or with micro-infiltration.

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Author(s): Plantade R, Hammou JC, Fighiera M, Aubanel D, Scotto A, Gueret S

Citation: Journal de Radiologie, April 2004, vol./is. 85/4 Pt 1(391-401), 0221-0363:0221-0363 (2004 Apr)

Publication Date: April 2004

Abstract: PURPOSE: To assess the reliability of vacuum-assisted biopsy in diagnosing and managing atypical ductal hyperplasia and ductal carcinoma in situ of the breast.MATERIALS AND METHOD: Retrospective review of 2130 stereotactic large-core biopsies in 1638 patients over a 40 month period (January 2000 to May 2003) using the mammotome 11-gauge and a dedicated Fischer table. A total of 135 cases of atypical ductal hyperplasia and 322 cases of ductal carcinoma in situ were diagnosed. The average number of cores was 18 (5-64). Surgical resection was systematic for carcinomas and selective for atypical ductal hyperplasia. Correlation with surgical findings (n:356) or mammographic follow-up (n:98) is presented. The influence of various factors on the risk of underestimation was analyzed.RESULTS: Resection revealed an underestimation of 10/37 (27%) for atypical ductal hyperplasia. It was lower (9%) when the radiological lesion had completely disappeared. Underestimation of ductal carcinoma in situ was 12/319 (3.8%). It was higher for masses, high-grade lesions or with micro-infiltration, or in the case where the peripheral edge was affected. Of the 98 atypical ductal hyperplasia that were not surgically biopsied, 81 were monitored at 9-42 months (average: 29 months). Sixteen underwent repeat biopsy: two infiltrating lobular carcinomas were detected in the same area.CONCLUSION: Underestimation of atypical ductal hyperplasia was high, justifying systematic surgical resection. Underestimation of ductal carcinoma in situ and its practical consequences are not significant with the extension of sentinel lymphadenectomy to the wide high-grade lesions or with micro-infiltration.

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92. Comparison of sonographically guided vacuum-assisted and automated core-needle breast biopsy methods [Turkish] Meme lezyonlarinda US kilavuzlugunda vakum destekli biyopsi (mamotom) ve "tru-cut" biyopsi yontemlerinin karsilaştırma

Author(s): Semiz Oysu A., Kaya H., Gulluoglu B., Aribal E.

Citation: Tanisal ve girisimsel radyoloji : Tibbi Goruntuleme ve Girisimsel Radyoloji Dernegi yayin organi, March 2004, vol./is. 10/1(44-47), 1300-4360 (Mar 2004)

Publication Date: March 2004

Abstract: PURPOSE: To compare the diagnostic accuracy and complication rates of sonographically guided vacuum-assisted and automated core-needle breast biopsy methods. MATERIALS AND METHODS: Sonographically guided biopsy was performed in 125 solid breast lesions found at mammography and observed at ultrasonography. Vacuum-assisted biopsy was performed in 61 lesions, while automated core-needle biopsy was performed in 64 lesions. The lesions with a benign histological diagnosis were followed radiologically. Those lesions with a histological diagnosis of malignancy or atypical ductal hyperplasia underwent surgical treatment. RESULTS: In the vacuum-assisted
biopsy group, 62.3% of the lesions were totally removed. Four lesions in vacuum-assisted biopsy group and two lesions in the automated core-needle biopsy group were diagnosed as atypical ductal hyperplasia histologically. Of the 4 BI-RADS category lesions, three lesions from each group were noted to be malignant. Histological results were not significantly different between the two groups (p>0.05). In both groups, lesions diagnosed as atypical ductal hyperplasia or malignancy showed no difference in the histological diagnosis after excisional biopsy. Complication rates were not significantly different between the two biopsy methods (p>0.05). CONCLUSION: No significant difference was found between sonographically guided vacuum-assisted and automated core-needle breast biopsy methods in terms of diagnostic accuracy and complication rates. However, vacuum-assisted biopsy can be preferred for total removal of the benign lesions.

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93. [Comparison of sonographically guided vacuum-assisted and automated core-needle breast biopsy methods]. [Turkish] Meme lezyonlarında US kilavuzluğunda vakum destekli biyopsi (mamotom) ve "tru-cut" biyopsi yontemlerinin karşılaştırılması.

Author(s): Semiz Oysu A, Kaya H, Gulluoglu B, Aribal E

Citation: Tanisal ve Giri Simsel Radyoloji: Tibbi Göruntuleme ve Giri Simsel Radyoloji Dernegi Yayın Organı, March 2004, vol./is. 10/1(44-7), 1300-4360;1300-4360 (2004 Mar)

Publication Date: March 2004

Abstract: PURPOSE: To compare the diagnostic accuracy and complication rates of sonographically guided vacuum-assisted and automated core-needle breast biopsy methods.MATERIALS AND METHODS: Sonographically guided biopsy was performed in 125 solid breast lesions found at mammography and observed at ultrasonography. Vacuum-assisted biopsy was performed in 61 lesions, while automated core-needle biopsy was performed in 64 lesions. The lesions with a benign histological diagnosis were followed radiologically. Those lesions with a histological diagnosis of malignancy or atypical ductal hyperplasia underwent surgical treatment.RESULTS: In the vacuum-assisted biopsy group, 62.3% of the lesions were totally removed. Four lesions in vacuum-assisted biopsy group and two lesions in the automated core-needle biopsy group were diagnosed as atypical ductal hyperplasia histologically. Of the 4 BI-RADS category lesions, three lesions from each group were noted to be malignant. Histological results were not significantly different between the two groups (p>0.05). In both groups, lesions diagnosed as atypical ductal hyperplasia or malignancy showed no difference in the histological diagnosis after excisional biopsy. Complication rates were not significantly different between the two biopsy methods (p>0.05).CONCLUSION: No significant difference was found between sonographically guided vacuum-assisted and automated core-needle breast biopsy methods in terms of diagnostic accuracy and complication rates. However, vacuum-assisted biopsy can be preferred for total removal of the benign lesions.

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94. Evaluation of Breast Imaging Reporting and Data System Category 3 mammograms and the use of stereotactic vacuum-assisted breast biopsy in a nonacademic community practice.

Author(s): Mendez A, Cabanillas F, Echenique M, Malekshamran K, Perez I, Ramos E

Citation: Cancer, February 2004, vol./is. 100/4(710-4), 0008-543X;0008-543X (2004 Feb 15)

Publication Date: February 2004

Abstract: BACKGROUND: Breast Imaging Reporting and Data System (BI-RADS) Category 3 represents 'probably benign' mammographic abnormalities requiring close
follow-up, but biopsies sometimes are performed on Category 3 abnormalities. Controversy exists as to when these biopsies are justified. The goals of the current study were to evaluate the use of stereotactic vacuum-assisted breast biopsy (SVABB) for BI-RADS 3 lesions in a nonacademic community hospital-based practice, to evaluate the false-negative rate of Category 3 mammograms, and to determine whether any specific lesions misinterpreted as BI-RADS 3 abnormalities might commonly be associated with malignant disease.

METHODS: From August 2000 to December 2002, the authors performed 947 SVABB procedures on 911 patients. They focused on 156 SVABBs of BI-RADS 3 abnormalities.

RESULTS: Of 634 SVABB procedures requested by outside sources, 114 (18%) were performed for BI-RADS 3 abnormalities, compared with 42 (13%) of 313 SVABB procedures that were performed based on mammographic findings at the authors’ practice (P = 0.075). After SVABB, 7 of 156 patients with BI-RADS 3 lesions were diagnosed with breast carcinoma and 1 was diagnosed with atypical ductal hyperplasia. Therefore, the false-negative rate of BI-RADS 3 mammograms was 4.5% (i.e., 7 of 156 patients). Patients with linear microcalcifications had the highest rate of cancer (4 of 14 [29%]) compared with patients without microcalcifications (1 of 64 [1.5%]) and patients with nonlinear microcalcifications (2 of 69 [2.9%]).

CONCLUSIONS: The use of SVABB for BI-RADS 3 lesions reflected uncertainty regarding the potential for a diagnosis of malignant disease rather than the financial incentive of performing a biopsy. SVABB was not necessary for patients with BI-RADS 3 lesions without microcalcifications or for patients with nonlinear microcalcifications. Lesions with linear (casting or branching) microcalcifications should not be considered BI-RADS 3 abnormalities. Copyright 2004 American Cancer Society.

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95. Stereotactic vacuum-assisted breast biopsy in 2874 patients: a multicenter study.

Author(s): Kettritz U, Rotter K, Schreer I, Murauer M, Schulz-Wendtland R, Peter D, Heywang-Kobrunner SH

Citation: Cancer, January 2004, vol./is. 100/2(245-51), 0008-543X;0008-543X (2004 Jan 15)

Publication Date: January 2004

Abstract: BACKGROUND: Vacuum-assisted breast biopsy (VAB) can replace surgical biopsy for the diagnosis of breast carcinoma. The authors evaluated the accuracy and clinical utility of VAB in a multicenter setting using a strict quality assurance protocol.

METHODS: In the current study, VABs were performed successfully for 2874 patients at 5 sites. Benign lesions were verified by follow-up. Surgery was recommended for malignant and borderline lesions. VAB was performed on patients with lesions rated as highly suspicious (6%), intermediate to suspicious (85%), or probably benign (9%). Fifty-eight percent of the lesions were < 10 mm and 70% had microcalcifications.

RESULTS: The authors identified 7% of patients with invasive carcinomas, 15% with ductal carcinomas in situ (DCIS), 5% with atypical ductal hyperplasias (ADH), and 0.6% with lobular carcinomas in situ. The results of the VAB necessitated an upgrade of 24% of patients with ADH to DCIS or DCIS and invasive carcinoma. Twelve percent of patients with DCIS proved to have invasive carcinoma. Seventy-three percent of the patients had benign lesions. Only 1 false-negative result was encountered (negative predictive value, 99.95%). Minor side effects were reported to occur in 1.4% of patients and 0.1% of patients required a subsequent intervention. Scarring relevant for mammography was rare among patients (i.e., 0.3% of patients had relevant scarring).

CONCLUSIONS: Quality-assured VAB was found to be highly reliable. VAB effectively identified patients with benign lesions and assisted therapeutic decisions. Most important, only a single case of malignancy was missed. A close interdisciplinary approach assured optimal results. Copyright 2003 American Cancer Society.

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96. Fast MRI-Guided Vacuum-Assisted Breast Biopsy: Initial Experience


Citation: American Journal of Roentgenology, November 2003, vol./is. 181/5(1283-1293), 0361-803X (November 2003)

Publication Date: November 2003

Abstract: OBJECTIVE. The purpose of this study was to evaluate a new method for performing MRI-guided vacuum-assisted breast biopsy in a study of lesions that had subsequent surgical excision. SUBJECTS AND METHODS. Twenty women scheduled for MRI-guided needle localization and surgical biopsy were prospectively entered in the study. MRI-guided biopsy was performed with a vacuum-assisted probe, followed by placement of a localizing clip, and then needle localization for surgical excision. Vacuum-assisted biopsy and surgical histology were correlated. RESULTS. Vacuum-assisted biopsy was successfully performed in 19 (95%) of the 20 women. The median size of 27 MRI-detected lesions that had biopsy was 1.0 cm (range, 0.4-6.4 cm). Cancer was present in eight (30%) of 27 lesions and in six (32%) of 19 women; among these eight cancers, five were infiltrating and three were ductal carcinoma in situ (DCIS). Among these 27 lesions, histology was benign at vacuum-assisted biopsy and at surgery in 19 (70%), cancer at vacuum-assisted biopsy in six (22%), atypical ductal hyperplasia at vacuum-assisted biopsy and DCIS at surgery in one (4%), and benign at vacuum-assisted biopsy with surgery showing microscopic DCIS that was occult at MRI in one (4%). The median time to perform vacuum-assisted biopsy of a single lesion was 35 min (mean, 35 min; range, 24-48 min). Placement of a localizing clip, attempted in 26 lesions, was successful in 25 (96%) of 26, and the clip was retrieved on specimen radiography in 22 (96%) of 23. One complication occurred: a hematoma that resolved with compression. CONCLUSION. MRI-guided vacuum-assisted biopsy is a fast, safe, and accurate alternative to surgical biopsy for breast lesions detected on MRI.

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97. Intraoperative ultrasonographically guided excisional biopsy or vacuum-assisted core needle biopsy for nonpalpable breast lesions.

Author(s): Chen SC, Yang HR, Hwang TL, Chen MF, Cheung YC, Hsueh S

Citation: Annals of Surgery, November 2003, vol./is. 238/5(738-42), 0003-4932;0003-4932 (2003 Nov)

Publication Date: November 2003

Abstract: OBJECTIVE: To compare duration and rates of underestimation and complete excision for nonpalpable breast lesions using either intraoperative ultrasonographically guided excisioned biopsy (IUGE) or directional vacuum-assisted biopsy (DVAB).SUMMARY BACKGROUND DATA: Percutaneous ultrasonography-guided core needle biopsy is preferable to stereotactic biopsy for treatment of nonpalpable breast lesions; however, underestimation and false-negative results can occur, and rebiopsy may be required. To date, however, there has been no comparison of these two procedures in terms of diagnostic accuracy and duration.METHODS: For 4 consecutive years, IUGE was performed for 104 nonpalpable breast lesions and DVAB for 128 lesions at Chang Gung Memorial Hospital. Of the DVAB cases, the handheld mammatome was used for 53 procedures, with all lesions removed as completely as possible. The duration of the two
procedures was calculated from initial skin incision until completion of wound closure. Most of the patients with benign pathology underwent ultrasonographic examination at 3 months after surgery, with a follow-up examination at 1 year. Surgery was performed subsequently for all of the malignancy cases.

RESULTS: The average ages and mean tumor sizes for patients undergoing IUGE or DVAB were 46 and 47 years and 1.1 and 1.0 cm, respectively. The average IUGE and DVAB surgery durations for 88 benign tumors and 117 benign lesions were 44.3 and 21.5 minutes, respectively (P < 0.001), and 43.5 and 20.6 minutes for the malignant tumors (n = 16 and n = 11), respectively (P = 0.036). The IUGE and DVAB surgery durations for tumors <1 cm in diameter were 43.5 and 20.6 minutes, respectively, and 44.2 and 23.6 minutes for tumors over that size (P < 0.001). An older-model mammotome was used for 75 patients, with an average duration of 24 minutes in comparison to 18 minutes for the handheld variant (P < 0.001). No false-negative results were noted and, except in the case of the malignant tumors, there was no need for reexcisional biopsy. Further, there were no underestimates of the disease for the 4 cases of atypical ductal hyperplasia and the 12 of noninvasive carcinoma. No further ultrasonographic evidence of tumors was noted for 95% of the benign pathologies, with no residual abnormality detected for 13 of the 27 malignant tumors after IUGE or DVAB.

CONCLUSIONS: For treatment of nonpalpable breast lesions, both IUGE and DVAB eliminate false-negative results, underestimates, and the requirement for reexcisional biopsy. In comparison to IUGE, DVAB is more convenient and time efficient for excisional biopsy of nonpalpable breast lesions.

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98. Biopsy needle technique and the accuracy of diagnosis of atypical ductal hyperplasia for mammographic abnormalities.

Author(s): Zhao L, Freimanis R, Bergman S, Shen P, Perrier ND, Lesko N, Pulaski T, Pulaski S, Carr JJ, Levine EA

Citation: American Surgeon, September 2003, vol./is. 69/9(757-62; discussion 762), 0003-1348;0003-1348 (2003 Sep)

Publication Date: September 2003

Abstract: The evaluation of mammographic abnormalities has become a substantial effort for surgeons and radiologists. The vacuum-assisted core biopsy (VABC) has been touted as a more accurate tool for the evaluation of mammographic lesions. Diagnosis of atypical ductal hyperplasia (ADH) from a percutaneous needle biopsy of the breast is associated with a significant risk of missing a significant breast lesion. We compared 2 methods of sampling with stereotactic-guided breast biopsy, 14-gauge automated gun core biopsy (AGCB) and VABC, on the accuracy of diagnosis of ADH at a single institution. All cases of ADH, without associated malignancy, found via image-guided breast biopsy of nonpalpable lesions between March 1996 and April 2002 were evaluated. VABC biopsy needles were utilized between July 1998 to April 2002 (686 patients) and 14-gauge AGCB from March 1996 to June 1998 (350 patients). The results of these biopsies were reviewed and compared to surgical biopsy and pathological records. ADH alone was found in 53 cases (5.1% of biopsies; mean age 57.9 years). Of these, 39 patients with ADH subsequently underwent wire-localized excisional biopsy. The other 14 patients were observed. VABC biopsy understaged 7 of 29 (24%) patients with ADH (all of which were DCIS), AGCB understaged 4 of 10 cases (40%) with one being invasive. Of the patients in the core biopsy group who were initially followed, 2 developed significant lesions within 3 years of follow-up in the same quadrant of the breast. If these cases are added to the AGCB group, then 50 per cent were understaged and significantly more invasive lesions were understaged than with VABC (17% vs. 0%; P = 0.018). The VABC resulted in less understaging of ADH than AGCB. However, there remains a significant risk of missing DCIS in this setting even with the VABC. Furthermore, the risk of understaging an invasive
lesion is significantly lower in this setting with a VACB than an AGCB. Although the risk of understaging ADH is lower with the VACB, we continue to recommend excisional biopsy in a good-risk patient when a diagnosis of ADH is rendered via VACB biopsy.

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### 99. Stereotactic breast biopsy: an audit of 18 months at BreastScreen Auckland.

**Author(s):** Greenberg D, Johnston J, Hart R, Weston M, Benson-Cooper D

**Citation:** Australasian Radiology, September 2003, vol./is. 47/3(261-7), 0004-8461;0004-8461 (2003 Sep)

**Publication Date:** September 2003

**Abstract:** Stereotactic biopsy has become a widely used technique for mammographically detected lesions that are clinically and sonographically occult. Vacuum-assisted (mammotome) biopsy on a dedicated prone stereotactic unit has further increased ease of biopsy and utility of the technique. Results of an 18-month audit in the national breast screening programme (BreastScreen Auckland and North) in the Auckland region demonstrates results comparable with those achieved elsewhere. Of a total of 399 stereotactic biopsies, 23 were excluded as they were 14-G core biopsies rather than 11-G mammotome biopsies. Of 376 mammotome biopsies, 10 (2%) failed, 266 (70.7%) were benign, 39 (10.3%) were atypical ductal hyperplasia (ADH) and 70 (18.6%) were malignant. Of these, 14.6% were ductal carcinoma in situ (DCIS) and 4% were invasive carcinomas. All cases diagnosed as ADH underwent formal excision biopsy. Of the 39 cases, 33 demonstrated benign disease or residual ADH only on excision (84.6%) and six (15.4%) patients were upgraded: five to DCIS and one to invasive carcinoma. The significant complication rate was 0.5%. Indications for biopsy were calcification in 89% of cases, mass lesions in 10.6% of cases and architectural distortion in 0.2% of cases. The failure rate of 2% compares with hookwire biopsy series. Practical issues and protocols have been presented.

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### 100. Breast masses: Removal of all US evidence during biopsy by using a handheld vacuum-assisted device - Initial experience

**Author(s):** March D.E., Coughlin B.F., Barham R.B., Goulart R.A., Klein S.V., Bur M.E., Frank J.L., Makari-Judson G.

**Citation:** Radiology, May 2003, vol./is. 227/2(549-555), 0033-8419 (01 May 2003)

**Publication Date:** May 2003

**Abstract:** PURPOSE: To assess the effects of removal of all ultrasonographic (US) evidence of breast lesions by using a vacuum-assisted biopsy (VAB) device. MATERIALS AND METHODS: Thirty-four women with breast masses underwent US-guided biopsy with an 11-gauge VAB device, with which removal of all evidence of the lesion was attempted. Histologic findings were compared with results of surgery and follow-up imaging. Patient tolerance and perceptions of the procedure and the ability of the procedure to eliminate a palpable finding were evaluated with questionnaires and findings at follow-up physical examination. RESULTS: The biopsy protocol was completed in all cases. Twenty-six benign lesions (76%) and eight malignancies (24%) were diagnosed. After VAB, 10 patients (29%) underwent surgery on the basis of histologic findings of invasive carcinoma (n = 7), ductal carcinoma in situ (n = 1), lobular neoplasia (n = 1), or atypical ductal hyperplasia (n = 1). VAB resulted in complete excision of four of 10 lesions: two of eight malignancies and two of two benign lesions. Among 21 patients with benign lesions who
underwent 6-month follow-up imaging, eight (38%) had a definite residual mass. At 6-month follow-up examination, VAB was seen to have eliminated the palpable abnormality in seven (88%) of eight patients with initially palpable benign masses. Thirty-two patients (94%) described no or mild pain during biopsy, and 33 patients (97%) rated care as excellent. CONCLUSION: After removal of all US evidence of breast masses with a VAB device, there was a substantial probability that residual lesion that was not visualized during the procedure would later be found at surgery or follow-up imaging. A palpable mass (≤1.2 cm in mean diameter) was eliminated in 88% of cases, and patient tolerance and perceptions of the procedure were favorable. RSNA, 2003.

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Author(s): March DE, Coughlin BF, Barham RB, Goulart RA, Klein SV, Bur ME, Frank JL, Makari-Judson G

Citation: Radiology, May 2003, vol./is. 227/2(549-55), 0033-8419:0033-8419 (2003 May)
Publication Date: May 2003

Abstract: PURPOSE: To assess the effects of removal of all ultrasonographic (US) evidence of breast lesions by using a vacuum-assisted biopsy (VAB) device.MATERIALS AND METHODS: Thirty-four women with breast masses underwent US-guided biopsy with an 11-gauge VAB device, with which removal of all evidence of the lesion was attempted. Histologic findings were compared with results of surgery and follow-up imaging. Patient tolerance and perceptions of the procedure and the ability of the procedure to eliminate a palpable finding were evaluated with questionnaires and findings at follow-up physical examination.RESULTS: The biopsy protocol was completed in all cases. Twenty-six benign lesions (76%) and eight malignancies (24%) were diagnosed. After VAB, 10 patients (29%) underwent surgery on the basis of histologic findings of invasive carcinoma (n = 7), ductal carcinoma in situ (n = 1), lobular neoplasia (n = 1), or atypical ductal hyperplasia (n = 1). VAB resulted in complete excision of four of 10 lesions: two of eight malignancies and two of two benign lesions. Among 21 patients with benign lesions who underwent 6-month follow-up imaging, eight (38%) had a definite residual mass. At 6-month follow-up examination, VAB was seen to have eliminated the palpable abnormality in seven (88%) of eight patients with initially palpable benign masses. Thirty-two patients (94%) described no or mild pain during biopsy, and 33 patients (97%) rated care as excellent.CONCLUSION: After removal of all US evidence of breast masses with a VAB device, there was a substantial probability that residual lesion that was not visualized during the procedure would later be found at surgery or follow-up imaging. A palpable mass (< or =1.2 cm in mean diameter) was eliminated in 88% of cases, and patient tolerance and perceptions of the procedure were favorable. Copyright RSNA, 2003

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102. The role of stereotactic 11G vacuum biopsy for clarification of BI-RADS IV findings in mammography [German] Wertigkeit der stereotaktischen 11 G-vakuumbiopsie zur abklärung von befunden der kategorie BI-RADS IV in der
Purpose: To evaluate the potential of stereotactic vacuum breast biopsy in the histologic evaluation of suspicious mammographic findings (BI-RADS IV). Materials and Methods: In 221 patients with 227 probable mammographic lesions categorized as (BI-RADS-IV), stereotactic biopsies were performed with an 11gauge vacuum-assisted biopsy device (Mammotome). The evaluation included the histology of the specimens obtained with the Mammotome or with surgery, the time for the biopsy, the amount of bleeding, number of rotations and procured specimens, the extent of the resection and the complications. Results: The biopsies were technically successful in 214 of the 227 probable mammographic lesions, with 176 lesions mostly resected and 34 lesions removed more than 50%. No representative tissue was obtained from 4 lesions. All biopsies were performed without any clinically relevant complications and terminated after adequate material was obtained (O 28 specimens, 2.58 rotations). The mean time needed for performing the biopsy was 40.2 minutes. The histologic findings were DCIS (42 lesions), ADH (7 lesions), LCIS (3 lesions), ID-Ca (14 lesions, IL-Ca (3 lesions), and IDL-Ca (1 lesion). In 28 of 42 lesions with the initial DCIS histology, the surgical histology was also DCIS (n=28) or no residual tumor (n=10). In 4 lesions with an initial DCIS-histology, the surgical histology was invasive ductal cancer (9.5%). The late follow-up examinations (up to 3 years) did not find any evidence of a false negative biopsy. Conclusion: Stereotactic vacuum breast biopsy ideally complements existing breast biopsy methods. The method is minimal invasive with a low rate of mostly minor complications.

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103. Atypical ductal hyperplasia diagnosis by directional vacuum-assisted stereotactic biopsy of breast microcalcifications: Considerations for surgical excision


Citation: American Journal of Clinical Pathology, February 2003, vol./is. 119/2(248-253), 0002-9173 (01 Feb 2003)

Publication Date: February 2003

Abstract: In 824 patients who underwent directional vacuum-assisted biopsies (DVABs) of breast microcalcifications, 61 (7.4%) showed atypical ductal hyperplasia (ADH). The 42 who subsequently underwent excision were the subjects of this study. Cases were evaluated for the mammographic characteristics of the lesion, the percentage of lesion removed according to mammography, and histologic findings (including number of large ducts and/or terminal duct-lobular units involved with ADH) in DVAB specimens. Pathologic findings in the surgical specimens in the area of the biopsy site also were recorded. In the DVAB specimens, ADH was confined to an average of 1.5 large ducts or lobular units and was associated with microcalcifications in all of the patients. Surgical specimens showed ADH in 15 cases, no residual lesion in 24 cases, and ductal carcinoma in situ in 3 cases. We found that microcalcifications that contain ADH in less than 3 lobules or ducts and/or that are removed completely by DVAB do not reveal higher-risk lesions on excision; thus, removal is unnecessary. When assessing microcalcifications with ADH, clinicians should consider the percentage of microcalcifications removed by DVAB and the extent of lobular involvement to better assess the need for excision.

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Full Text:
104. Atypical ductal hyperplasia diagnosis by directional vacuum-assisted stereotactic biopsy of breast microcalcifications. Considerations for surgical excision.

Author(s): Sneige N, Lim SC, Whitman GJ, Krishnamurthy S, Sahin AA, Smith TL, Stelling CB

Citation: American Journal of Clinical Pathology, February 2003, vol./is. 119/2(248-53), 0002-9173;0002-9173 (2003 Feb)

Publication Date: February 2003

Abstract: In 824 patients who underwent directional vacuum-assisted biopsies (DVABs) of breast microcalcifications, 61 (7.4%) showed atypical ductal hyperplasia (ADH). The 42 who subsequently underwent excision were the subjects of this study. Cases were evaluated for the mammographic characteristics of the lesion, the percentage of lesion removed according to mammography, and histologic findings (including number of large ducts and/or terminal duct-lobular units involved with ADH) in DVAB specimens. Pathologic findings in the surgical specimens in the area of the biopsy site also were recorded. In the DVAB specimens, ADH was confined to an average of 1.5 large ducts or lobular units and was associated with microcalcifications in all of the patients. Surgical specimens showed ADH in 15 cases, no residual lesion in 24 cases, and ductal carcinoma in situ in 3 cases. We found that microcalcifications that contain ADH in less than 3 lobules or ducts and/or that are removed completely by DVAB do not reveal higher-risk lesions on excision; thus, removal is unnecessary. When assessing microcalcifications with ADH, clinicians should consider the percentage of microcalcifications removed by DVAB and the extent of lobular involvement to better assess the need for excision.

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105. The significance of atypical lobular hyperplasia at percutaneous breast biopsy.

Author(s): Dmytras K, Tartter PI, Mizrachy H, Chinitz L, Rosenbaum Smith S, Estabrook A

Citation: Breast Journal, January 2003, vol./is. 9/1(10-2), 1075-122X;1075-122X (2003 Jan-Feb)

Publication Date: January 2003

Abstract: Atypical lobular hyperplasia (ALH) is occasionally found in specimens obtained by percutaneous stereotactic vacuum-assisted breast biopsy for microcalcifications. Since malignancy is often found at surgical excision when atypical ductal hyperplasia is found at percutaneous biopsy, we reviewed our pathologic findings from surgery for ALH at percutaneous biopsy. This was a retrospective review of all percutaneous breast biopsy specimens for mammographic microcalcifications obtained from a single institution over a 30-month period. The pathologic findings from percutaneous biopsy were correlated with the radiologic appearance and the pathology from surgical excision. ALH was found in 13 of 766 (1.7%) stereotactic vacuum-assisted core needle biopsies performed for mammographic microcalcifications. Subsequent surgery in six patients revealed ductal carcinoma in situ (DCIS) in two patients and one case of invasive ductal carcinoma. Surgical excision is indicated for areas with ALH discovered by percutaneous biopsy for mammographic microcalcifications.

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106. Accuracy of 11-gauge vacuum-assisted core biopsy of mammographic breast lesions.

Author(s): Pandelidis S, Heiland D, Jones D, Stough K, Trapeni J, Suliman Y

Citation: Annals of Surgical Oncology, January 2003, vol./is. 10/1(43-7), 1068-9265 (2003 Jan-Feb)

Publication Date: January 2003

Abstract: BACKGROUND: Image-guided percutaneous biopsy has largely replaced excisional biopsy of mammographic lesions. Vacuum-assisted core biopsy has improved sampling of such lesions. The objectives of this study were to define the accuracy of the vacuum-assisted 11-gauge stereotactic core biopsy in sampling of atypical ductal hyperplasia (ADH) and ductal carcinoma in situ (DCIS) and to define histologic and mammographic features of target lesions, which predict sampling errors.METHODS: Between October 1996 and March 2000, 1341 patients underwent stereotactic 11-gauge vacuum-assisted biopsy. Patients with ADH or DCIS were encouraged to undergo excisional biopsy.RESULTS: Surgical excision of 37 ADH lesions revealed 5 missed DCIS lesions and 1 missed invasive cancer. Twelve of 91 DCIS lesions were upstaged to invasive cancer upon excision. The underestimation rate was highest in patients with DCIS when the target lesion for biopsy was a zone of calcifications >1.5 cm. No correlation existed between the histologic features of DCIS lesions diagnosed by stereotactic biopsy and the presence of infiltrating disease on excision.CONCLUSIONS: Vacuum-assisted 11-gauge stereotactic core biopsy understages 13.2% and 13.5% of DCIS and ADH lesions, respectively. In patients with DCIS found by stereotactic biopsy, a target zone of calcifications >1.5 cm is associated with a higher underestimation rate of infiltrating disease.

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107. Breast calcifications with percutaneous vacuum-assisted diagnosis of malignancy or atypical hyperplasia: Correlations with surgical findings [Italian]

Calcificazioni mammarie con diagnosi di malignita o iperplasia atipica su biopsia percutanea vacuum-assisted: Correlazioni dopo escissione chirurgica

Author(s): Piubello Q., Montemezzi S., D'Atri C.

Citation: Pathologica, December 2002, vol./is. 94/6(299-305), 0031-2983 (December 2002)

Publication Date: December 2002

Abstract: Percutaneous, stereotactic, vacuum-assisted biopsy has become a widely used alternative to open surgical biopsy for the initial diagnosis of breast calcifications. We retrospectively assessed the accuracy of the technique in the diagnoses of malignancy and atypical hyperplasia by correlation with the findings of the subsequent surgical excision. We studied 330 consecutive cases of breast calcifications, 216 (65.5%) of which were determined to be benign and 114 (34.5%) to be malignant or atypical at vacuum-assisted biopsy using an 11 gauge instrument. Of the latter, 93 were available for comparison with the subsequent surgery; the specific diagnoses as revealed by percutaneous biopsy were as follows: 11 cases of atypical ductal hyperplasia (ADH), 67 cases of ductal carcinoma in situ (DCIS), 6 infiltrating ductal carcinomas (IFDC), 2 cases of atypical lobular hyperplasia and 7 of lobular carcinoma in situ (LCIS). At histological analysis after surgical excision, 3 (27%) of 11 cases previously diagnosed as ADH and 6 (9%) of 67 cases diagnosed as DCIS were shown to actually be higher grade lesions (DCIS/IFDC and IFDC, respectively). Of the 7 lesions diagnosed at vacuum-assisted biopsy as LCIS, surgery and histological analysis showed one infiltrating lobular carcinoma and two DCIS. A total of 21 lesions (4 ADH, 14 DCIS, 1 IFDC, 2 LCIS) were completely removed at percutaneous biopsy; the remaining cases were found totally concordant. These data indicate a substantial accuracy of the percutaneous biopsy: some lesions (particularly, those thought to be ADH and DCIS) can be underestimated for sampling error.
108. [Breast calcifications with percutaneous vacuum-assisted biopsy diagnosis of malignancy or atypical hyperplasia: correlations with surgical findings]. [Italian] Calcificazioni mammarie con diagnosi di malignità o iperplasia atipica su biopsia percutanea vacuum-assisted: correlazioni dopo escissione chirurgica.

Author(s): Piubello Q, Montemezzi S, D’Atri C

Citation: Pathologica, December 2002, vol./is. 94/6(299-305), 0031-2983;0031-2983 (2002 Dec)

Publication Date: December 2002

Abstract: Percutaneous, stereotactic, vacuum-assisted biopsy has become a widely used alternative to open surgical biopsy for the initial diagnosis of breast calcifications. We retrospectively assessed the accuracy of the technique in the diagnoses of malignancy and atypical hyperplasia by correlation with the findings of the subsequent surgical excision. We studied 330 consecutive cases of breast calcifications, 216 (65.5%) of which were determined to be benign and 114 (34.5%) to be malignant or atypical at vacuum-assisted biopsy using an 11 gauge instrument. Of the latter 93 were available for comparison with the subsequent surgery, the specific diagnoses as revealed by percutaneous biopsy were as follows: 11 cases of atypical ductal hyperplasia (ADN), 67 cases of ductal carcinoma in situ (DCIS), 6 infiltrating ductal carcinomas (IFDC), 2 cases of atypical lobular hyperplasia and 7 of lobular carcinoma in situ (LCIS). At histological analysis after surgical excision, 3 (27%) of 11 cases previously diagnosed as ADH and 6 (9%) of 67 cases diagnosed as DCIS were shown to actually be higher grade lesions (DCIS/IFDC and IFDC, respectively). Of the 7 lesions diagnosed at vacuum-assisted biopsy as LCIS, surgery and histological analysis showed one infiltrating lobular carcinoma and two DCIS. A total of 21 lesions (4 ADH, 14 DCIS, 1 IFDC, 2 LCIS) were completely removed at percutaneous biopsy; the remaining cases were found totally concordant. These data indicate a substantial accuracy of the percutaneous biopsy: some lesions (particularly those thought to be ADH and DCIS) can be underestimated for sampling error.

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109. Atypical ductal hyperplasia of the breast diagnosed by 11-gauge directional vacuum-assisted biopsy.

Author(s): Rao A, Parker S, Ratzer E, Stephens J, Fenoglio M

Citation: American Journal of Surgery, December 2002, vol./is. 184/6(534-7; discussion 537), 0002-9610;0002-9610 (2002 Dec)

Publication Date: December 2002

Abstract: BACKGROUND: Small nonpalpable mammographic abnormalities are frequently diagnosed by percutaneous stereotactically guided core needle biopsy. The reliability of the histologic diagnosis of atypical ductal hyperplasia (ADH) made from tissue obtained by 11-gauge directional, vacuum-assisted biopsy of these nonpalpable breast lesions is unknown. METHODS: The records of 31 patients who were found to have ADH by 11-gauge directional vacuum-assisted biopsy were reviewed. All of these patients subsequently underwent surgical excision with needle localization biopsy of the ADH and they are the subjects of this retrospective study. RESULTS: Eleven of the 31 patients with ADH on 11-gauge directional vacuum-assisted biopsy were upgraded to ductal carcinoma in situ or infiltrating carcinoma by the excisional biopsy. This was a 35% underestimation of malignancy in our patients. CONCLUSIONS: When the histologic diagnosis of ADH is made from tissue harvested by an 11-gauge directional vacuum assisted biopsy, surgical excision of the entire abnormality is recommended to avoid underdiagnosis of breast cancer.
110. To excise or to sample the mammographic target: what is the goal of stereotactic 11-gauge vacuum-assisted breast biopsy?

**Author(s):** Liberman L, Kaplan JB, Morris EA, Abramson AF, Menell JH, Dershaw DD

**Citation:** AJR. American Journal of Roentgenology, September 2002, vol./is. 179/3(679-83), 0361-803X;0361-803X (2002 Sep)

**Publication Date:** September 2002

**Abstract:** OBJECTIVE: This study was undertaken to determine whether complete percutaneous excision rather than sampling of the mammographic target conveys any significant advantage or disadvantage at stereotactic 11-gauge vacuum-assisted biopsy. MATERIALS AND METHODS: A retrospective review was performed of 788 consecutive solitary lesions in which the mammographic target was excised (n = 466) or sampled (n = 322) at stereotactic 11-gauge vacuum-assisted biopsy. Medical records and histologic findings were reviewed to determine the frequency of sparing surgery, discordance, histologic underestimation, rebiopsy, complete histologic removal of cancer, and complications. Statistical comparisons were made using the Fisher's exact test. RESULTS: Complete excision rather than sampling of the mammographic target was associated with a significantly lower frequency of discordance (1/466, 0.2% vs 8/322, 2.5%; p = 0.004) and a trend toward fewer ductal carcinoma in situ underestimates (4/59, 6.8% vs 12/60, 20.0%; p = 0.07). Complete histologic removal of cancer was significantly more likely if the mammographic target was excised rather than sampled (19/91, 20.9% vs 7/106, 6.6%; p = 0.006); however, among 91 cancers in which the mammographic target was excised, surgery revealed residual cancer in 72 (79.1%). Complete excision rather than sampling of the mammographic target yielded no significant differences in the frequency of sparing surgery, atypical ductal hyperplasia underestimates, rebiopsy, or complications. CONCLUSION: Complete excision rather than sampling of the mammographic target was associated with lower frequencies of discordance and ductal carcinoma in situ underestimation but had no other advantage or disadvantage. Among cancers in which the mammographic target was excised, surgery revealed residual cancer in almost 80%.

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111. Atypical ductal hyperplasia: can some lesions be defined as probably benign after stereotactic 11-gauge vacuum-assisted biopsy, eliminating the recommendation for surgical excision?

**Author(s):** Jackman RJ, Birdwell RL, Ikeda DM

**Citation:** Radiology, August 2002, vol./is. 224/2(548-54), 0033-8419;0033-8419 (2002 Aug)

**Publication Date:** August 2002

**Abstract:** PURPOSE: To determine if a subset of atypical ductal hyperplasia (ADH) lesions diagnosed at 11-gauge, directional, vacuum-assisted, prone, stereotactic biopsy fit the "probably benign" definition of a less than 2% chance of being carcinoma at subsequent surgical excision. MATERIALS AND METHODS: Clinical, mammographic, and stereotactic biopsy features in 104 consecutive nonpalpable ADH lesions were correlated with the presence of carcinoma at lumpectomy. The results were analyzed with chi(2) statistic, with P <.05 indicative of significant difference. RESULTS: Surgical excision
revealed carcinoma in 22 (21%) of 104 ADH lesions. The lowest incidences of carcinoma (each P < .02) were 16% (15 of 92) in patients with no personal history of breast carcinoma, 13% (nine of 67) when maximum lesion diameter was less than 10 mm, and 8% (three of 36) when 100% of the mammographic lesion was removed at stereotactic biopsy. CONCLUSION: No clinical, mammographic, or biopsy features alone or in combination could be used to define a substantial subset of probably benign lesions with a less than 2% chance of carcinoma at lumpectomy. Copyright RSNA, 2002

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112. Surgical and mammographic follow-up of papillary lesions and atypical lobular hyperplasia diagnosed with stereotactic vacuum-assisted biopsy.

Author(s): Irfan K, Brem RF

Citation: Breast Journal, July 2002, vol./is. 8/4(230-3), 1075-122X;1075-122X (2002 Jul-Aug)

Publication Date: July 2002

Abstract: The purpose of this study was to assess the accuracy of stereotactic vacuum-assisted biopsy (SVAB) for the diagnosis of high-risk lesions, which include papillary lesions and atypical lobular hyperplasia (ALH). Retrospective review was performed of 212 consecutive SVABs at our institution between May 1, 2000 and February 28, 2001. Biopsies were performed using an 8-gauge SVAB probe, with the patient prone on a dedicated stereotactic table. Eleven to 17 cores (mean 12.4) were harvested from each lesion. Radiography of core specimens was performed in cases in which the targeted lesion contained microcalcifications. Six of the lesions (2.8%) demonstrated intraductal papilloma, 1 (16.7%) of which had features suggestive of a radial scar, and 7 (3.3%) demonstrated ALH. Surgical excision was performed on 3 of the 6 (50%) papillomas and all 7 (100%) cases of ALH. Histopathologic analysis at surgical excision demonstrated benign breast tissue in 1 of the papillomas (33.3%), radial scar in 1 (33.3%), and atypical ductal hyperplasia (ADH) in 1 (33.3%). One papilloma not surgically excised underwent repeat mammography at 6 months and demonstrated no change. Of the surgically excised lesions with ALH, 4 (57.1%) retained the diagnosis of ALH, though one of these (25%) also demonstrated a coexisting radial scar. One lesion (14.3%) demonstrated ductal carcinoma in situ (DCIS), 1 (14.3%) demonstrated lobular carcinoma in situ (LCIS), and 1 (14.3%) demonstrated fibrocystic change. Lesions diagnosed as papillomas at SVAB did not demonstrate malignancy, but 2 (66.7%) were found to contain high-risk lesions that may impact surveillance or prophylactic therapy (i.e., tamoxifen). Because of the relatively small series reported, additional studies are necessary to further assess the accuracy of SVAB in the diagnosis of benign papillary lesions. ALH diagnosed with SVAB that underwent subsequent surgical excision demonstrated cancer in 1 of 7 lesions (14.3%). This rate of cancer underestimation is similar to that seen with ADH diagnosed with SVAB, which warrants surgical excision to rule out malignancy. Therefore we recommend that lesions demonstrating ALH at SVAB be considered for surgical excision to rule out malignancy.

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113. Vacuum-assisted breast biopsy on digital stereotaxic table of nonpalpable lesions non-recognisable by ultrasonography.
Author(s): Apesteguia L, Mellado M, Saenz J, Cordero JL, Reparaz B, De Miguel C

Citation: European Radiology, March 2002, vol./is. 12/3(638-45), 0938-7994;0938-7994 (2002 Mar)

Publication Date: March 2002

Abstract: The aim of this study was to evaluate accuracy of 11 G vacuum-assisted percutaneous biopsy (VAPB) carried out on digital stereotaxic table, on breast non-palpable lesions (NPLs), non-visible by US. Prospective study on 132 consecutive NPLs (126 patients) not reliably found by US; 82% showed microcalcifications. Surgical confirmation was obtained in all malignant cases and when VAPB reported atypical lesion (ductal or lobular), radial scar or atypical papillary lesion. All patients with benign results were included in a mammographic follow-up programme. Two cases could not be dealt with due to technical difficulties. One to 26 cylinders were obtained from the remaining 130 NPLs. Sixty-four lesions were surgically confirmed. Forty-six of the 47 malignancies were correctly diagnosed. In one case of a malignant tumour, an atypical lesion was classified with VAPB. All cases of histologically verified lobular carcinoma in situ, atypical ductal or lobular hyperplasia, radial scar or atypical papillary lesion were correctly diagnosed preoperatively. The remaining lesions were benign in VAPB, and after 1 year of follow-up, no false negative has been found. Based on this short-term follow-up, absolute sensitivity was 97.9%, absolute specificity 84.3% and accuracy was 99.2%. For predicting invasion, accuracy was 89.1%. Vacuum-assisted percutaneous biopsy is a very accurate technique for NPLs which are not detectable by US. It can replace approximately 90% of DSB with no important complications, avoiding scars and providing a higher level of comfort.

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114. MR-guided vacuum biopsy of 206 contrast-enhancing breast lesions [German] MRT-gefuhrte vakuumbiopsie bei 206 kontrastmittelanreichernden lasionen der mamma

Author(s): Perlet C., Schneider P., Amaya B., Grosse A., Sittek H., Reiser M.F., Heywang-Kobrunner S.H.

Citation: RoFo Fortschritte auf dem Gebiet der Rontgenstrahlen und der Bildgebenden Verfahren, 2002, vol./is. 174/1(88-95), 1438-9029 (2002)

Publication Date: 2002

Abstract: Purpose: To determine the accuracy and clinical use of MR-guided vacuum biopsy (VB) of enhancing breast lesions. Material and Methods: 254 lesions were referred to MR-guided vacuum-assisted breast biopsy. In 43 (16%) patients the indication was dropped because the lesions could not be identified at the time VB was scheduled. This was due to hormonal influences (n = 37), to too strong compression (n = 3) or to misinterpretation of the initial diagnostic MRI (n = 3). In 5 cases (2%) VB was not performed due to obesity (n = 2); problems of access (n = 2) or a defect of the MR-unit (n = 1). VB was performed on altogether 206 lesions. In 4 cases (2%) VB was unsuccessful. This was immediately realized on the post-interventional images. Thus a false negative diagnosis was avoided. Verification included excision of the cavity in cases with proven malignancy or atypical ductal hyperplasia (ADH) and (for benign lesions) retrospective correlation of VB-histology with pre-and postinterventional MRI and subsequent follow-up. Results: 51/202 successful biopsies proved malignancy. In 7 cases ADH and in 144 cases a benign lesion was diagnosed. One DCIS was underestimated as ADH. All other benign or malignant diagnoses proved to be correct. Conclusion: MR-guided VB allows reliable histological work-up of contrast-enhancing small lesions which are not visible by any other modality.

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115. **MR-Guided vacuum biopsy of 206 contrast-enhancing breast lesions.**

**Author(s):** Perlet C, Schneider P, Amaya B, Grosse A, Sittek H, Reiser MF, Heywang-Kobrunner SH

**Citation:** Rofo: Fortschritte auf dem Gebiete der Rontgenstrahlen und der Nuklearmedizin, January 2002, vol./is. 174/1(88-95), 1438-9029;1438-9010 (2002 Jan)

**Publication Date:** January 2002

**Abstract:** PURPOSE: To determine the accuracy and clinical use of MR-guided vacuum biopsy (VB) of enhancing breast lesions. MATERIAL AND METHODS: 254 lesions were referred to MR-guided vacuum-assisted breast biopsy. In 43 (16 %) patients the indication was dropped because the lesions could not be identified at the time VB was scheduled. This was due to hormonal influences (n = 37), to too strong compression (n = 3) or to misinterpretation of the initial diagnostic MRI (n = 3). In 5 cases (2 %) VB was not performed due to obesity (n = 2); problems of access (n = 2) or a defect of the MR-unit (n = 1). VB was performed on altogether 206 lesions. In 4 cases (2 %) VB was unsuccessful. This was immediately realized on the post-interventional images. Thus a false negative diagnosis was avoided. Verification included excision of the cavity in cases with proven malignancy or atypical ductal hyperplasia (ADH) and (for benign lesions) retrospective correlation of VB-histology with pre- and postinterventional MRI and subsequent follow-up. RESULTS: 51/202 successful biopsies proved malignancy. In 7 cases ADH and in 144 cases a benign lesion was diagnosed. One DCIS was underestimated as ADH. All other benign or malignant diagnoses proved to be correct. CONCLUSION: MR-guided VB allows reliable histological work-up of contrast-enhancing small lesions which are not visible by any other modality.

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116. **Sonographically guided directional vacuum-assisted breast biopsy using a handheld device.**

**Author(s):** Parker SH, Klaus AJ, McWey PJ, Schilling KJ, Cupples TE, Duchesne N, Guenin MA, Harness JK

**Citation:** AJR. American Journal of Roentgenology, August 2001, vol./is. 177/2(405-8), 0361-803X;0361-803X (2001 Aug)

**Publication Date:** August 2001

**Abstract:** OBJECTIVE: The goal of this study was to show that one can safely remove all sonographic evidence of masses in the breast less than or equal to 1.5 cm in greatest dimension using the 11-gauge handheld Mammotome, thereby reducing the possibility of a false-negative diagnosis and other shortcomings of the automated core biopsy device. SUBJECTS AND METHODS: Over a 12-week period (May 3-July 31, 2000), 124 sonographically guided breast biopsies were performed in 113 patients, using a new handheld directional vacuum-assisted biopsy device. All lesions that were less than or equal to 1.5 cm were biopsied using a handheld Mammotome; an attempt was made to continue the biopsy until no sonographic evidence of the lesion remained. RESULTS: Of these 124 lesions, 14 had infiltrating ductal carcinomas, four had infiltrating ductal carcinomas with associated ductal carcinoma in situ, one had infiltrating lobular carcinoma, one had ductal carcinoma in situ, three had atypical ductal hyperplasias, one had atypical lobular hyperplasia, and one had phyllodes tumor. Only one infiltrating ductal carcinoma was entirely removed histologically at Mammotome biopsy. There were no underestimates of disease. No cases of epithelial displacement were observed in any of the surgical excisions of malignancies. The remaining 99 lesions were benign. CONCLUSION: The handheld Mammotome diminishes the shortcomings of the automated core biopsy device. It reduces the possibility of false-negatives and underestimation of disease. It eliminates the need for multiple insertions and reduces the likelihood of epithelial displacement. As a result, we now use this device for all sonographically guided biopsies of breast masses smaller than 1.5 cm and recommend that others consider it for such use.
Atypical ductal hyperplasia and ductal carcinoma in situ as revealed by large-core needle breast biopsy: results of surgical excision.

**Author(s):** Darling ML, Smith DN, Lester SC, Kaelin C, Selland DL, Denison CM, DiPiro PJ, Rose DI, Rhei E, Meyer JE

**Citation:** AJR. American Journal of Roentgenology, November 2000, vol./is. 175/5(1341-6), 0361-803X;0361-803X (2000 Nov)

**Publication Date:** November 2000

**Abstract:** OBJECTIVE: This investigation compares the frequency of histologic underestimation of breast carcinoma that occurs when a large-core needle biopsy reveals atypical ductal hyperplasia or ductal carcinoma in situ with the automated 14-gauge needle, the 14-gauge directional vacuum-assisted biopsy device, and the 11-gauge directional vacuum-assisted biopsy device.

SUBJECTS AND METHODS: Evaluation of 428 large-core needle biopsies yielding atypical ductal hyperplasia (139 lesions) or ductal carcinoma in situ (289 lesions) was performed. The results of subsequent surgical excision were retrospectively compared with the needle biopsy results.

RESULTS: For lesions initially diagnosed as ductal carcinoma in situ, underestimation of invasive ductal carcinoma was significantly less frequent using the 11-gauge directional vacuum-assisted biopsy device when compared with the automated 14-gauge needle (10% versus 21%, p < 0.05) but was not significantly less frequent when compared with the 14-gauge directional vacuum-assisted device (10% versus 17%, p > 0.1). For lesions diagnosed initially as atypical ductal hyperplasia, underestimation of ductal carcinoma in situ and invasive ductal carcinoma was significantly less frequent using the 11-gauge directional vacuum-assisted biopsy device compared with the 14-gauge directional vacuum-assisted device (19% versus 39%, p = 0.025) and with the automated 14-gauge needle (19% versus 44%, p = 0.01).

CONCLUSION: The frequency of histologic underestimation of breast carcinoma in lesions initially diagnosed as atypical ductal hyperplasia or ductal carcinoma in situ using large-core needle biopsy is substantially lower with the 11-gauge directional vacuum-assisted device than with the automated 14-gauge needle and with the 14-gauge directional vacuum-assisted device.

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117. Clinical management issues in percutaneous core breast biopsy

**Author(s):** Liberman L.

**Citation:** Radiologic Clinics of North America, 2000, vol./is. 38/4(791-807), 0033-8389 (2000)

**Publication Date:** 2000

**Abstract:** Percutaneous imaging-guided core biopsy is a less invasive and less expensive alternative to surgical biopsy for the evaluation of breast lesions. Percutaneous core biopsy is most often used for evaluation of BI-RADS category 4 lesions, but may also be helpful in the evaluation of some BI-RADS category 5 lesions. Stereotactic guidance is particularly useful for calcifications; for masses that can be seen with ultrasound, ultrasound guidance
may be preferable because of the absence of radiation and lower cost. The automated core biopsy needle is excellent for mass lesions, but directional vacuum-assisted biopsy is superior for calcifications. Directional vacuum-assisted biopsy may also be preferable for small lesions that may require placement of a localizing clip and lesions that are superficial or in thin breasts. The more expensive ABBI device has substantial limitations, and its role in percutaneous breast biopsy has not been demonstrated. Complete removal of the mammographic target can occur at percutaneous biopsy, and is a more frequent event when the larger tissue acquisition devices are used. Complete removal of the mammographic target does not ensure complete excision of the histologic process. Further investigation is necessary to determine in which lesions, if any, complete removal of the target is advantageous. Epithelial displacement can occur during all breast needling procedures, but may be less frequent at directional vacuum-assisted biopsy than at fine-needle aspiration or automated core biopsy. There is no evidence that displaced cells are of biologic significance, but displaced DCIS can mimic infiltrating carcinoma. The pathologist should be aware of the findings of epithelial displacement, to avoid misdiagnosing DCIS as infiltrating ductal carcinoma. Some lesions warrant repeat biopsy or surgical excision after percutaneous core biopsy. Repeat biopsy is warranted if histologic findings and imaging findings are discordant. Surgical excision is warranted for lesions yielding a percutaneous diagnosis of ADH or possible phyllodes tumor. Controversy exists regarding the need for surgical excision after percutaneous diagnosis of radial scar, papillary lesion, ALH, or LCIS. Follow-up is necessary if percutaneous biopsy yields benign findings concordant with imaging characteristics. Follow-up protocols vary, but all require substantial commitment of time and resources. We have an embarassment of riches for performing percutaneous core biopsy of the breast. It can be estimated that approximately 1 million breast biopsies will be performed this year to diagnose approximately 200,000 breast cancers. Percutaneous core biopsy may spare many of these women the need for a more deforming, invasive, and expensive surgical biopsy. Further work is necessary to optimize criteria for patient selection, develop and define the role of new technologies for tissue acquisition, refine protocols for management after percutaneous breast biopsy, and assess long-term outcome, so that more women can benefit from this minimally invasive approach to breast diagnosis.

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Vacuum-assisted excision of breast lesions of uncertain malignant potential (B3)-an alternative to surgery in selected cases
SL Tennant, A Evans, LJ Hamilton, J James... - The Breast, 2008 - Elsevier
... Histological diagnosis, size of lesion, and completeness of excision were recorded. ... Results. A total of 42 VAE procedures were performed for B3 lesions over 48 months. Twenty six (62%) were screen-detected lesions – 13 papillary lesions and 13 radial scars. ...
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Borderline breast core needle histology: predictive values for malignancy in lesions of uncertain malignant potential (B3)
N Houssami, S Ciatto, M Bilous, V Vezzosi... - British journal of ..., 2007 - nature.com
... acknowledging that a few studies have included more cases per specific B3 lesion (Cawson et ... characterisation of morphological features that potentially allow accurate shifting of some B3 lesions into either ... PPV) on CNB to either re-sample or remove the imaging lesion, as an ...
Cited by 48 - Related articles - Find@The Christie - BL Direct - All 7 versions
Follow-up surgical excision is indicated when breast core needle biopsies show atypical lobular hyperplasia or lobular carcinoma in situ: a correlative study of 33 ... 

TM Elsheikh... - The American journal of surgical ..., 2005 - journals.lww.com 
... MATERIALS AND METHODS. Breast CNBs with the diagnosis of pure LCIS or ALH (not associated with other high-risk lesions such as ADH, radial scar, papillary lesion, etc) were retrieved from the files of Pathologists Associated at Ball Memorial Hospital (28 cases) and ...

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Nonmalignant lesions in breast core needle biopsies: to excise or not to excise? 

TW Jacobs, JL Connolly... - The American journal of ..., 2002 - journals.lww.com 
... taken into consideration when evaluating the need for excision of nonmalignant lesions encountered in ... that ADH represents a generalized risk factor for the development of breast cancer, which ... finding of ADH in the CNB samples is completely representative of the target lesion. ...

Cited by 203 - Related articles - BL Direct - All 10 versions

Accuracy and underestimation of malignancy of breast core needle biopsy: the Florence experience of over 4000 consecutive biopsies 

S Ciatto, N Houssami, D Ambrogetti... - Breast cancer research ..., 2007 - Springer 
... Categories included B1 = negative, B2 = benign, B3 = benign but of uncertain biological potential (including atypical ductal and lobular hyperplasia, phyllodes tumour, papillary lesions, radial scar complex/sclerosing lesion), in situ cancer, invasive cancer, and ... 

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Nonmalignant papillary lesions of the breast at US-guided directional vacuum-assisted removal: a preliminary report 

MJ Kim, EK Kim, JY Kwak, EJ Son, BW Park... - European ..., 2008 - Springer 
... We also excluded four cases in four patients who complained of nipple discharge as the purpose ... Surgical findings included benign papillomas in three cases and no residual lesion in one. The frequency of upgrade rate and in DVAR of papillary breast lesions was 0% in benign ...

Cited by 15 - Related articles - Find@The Christie - All 6 versions

The significance of mammotome core biopsy specimens without radiographically identifiable microcalcification and their influence on surgical management 

D Cox, S Bradley... - The Breast, 2006 - Elsevier 
... where the majority of such microcalcifications (24/32) were found to represent normal breast tissue or ... It is interesting to note that in one of the B3 lesions the overall histology was ... by the contents of POT B which revealed more significant pathology than the target lesion in POT A ...

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Use of Ultrasound-Guided Percutaneous Vacuum-Assisted Breast Biopsy for Selected Difficult Indications 

SH Heywang-Köbrunner, A Heinig... - The Breast ..., 2009 - Wiley Online Library 
... For certain lesions or settings (expected unspecific histopathology, fibrosis, possible B3-lesion, very small lesion, diffuse growth pattern, etc.), in fact the probability of receiving a concordant and sufficiently reliable result of US-CNB may be low. ...

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Image-guided breast biopsy: state-of-the-art
EAM O'Flynn, ARM Wilson... - Clinical radiology, 2010 - Elsevier
... to surgical biopsy, it is a short procedure that does not deform the breast, is associated
... need for larger volumes of tissue for histological examination and allows biopsy of
lesions that are ... Table 2 illustrates the difference in choice of sampling method for
specific types of lesion. ...
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Underestimation of malignancy of atypical ductal hyperplasia diagnosed on 11-
gauge stereotactically guided MammoTome breast biopsy: an Asian breast screen ...
J Teng-Swan Ho, PH Tan, SW Hee... - The Breast, 2008 - Elsevier
... Two women had ADH diagnosed by core biopsy in both breasts. One woman had DCIS
in the left breast and a benign lesion in the right at excision. The other had benign lesions
in both breasts on subsequent surgical excision. ...
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