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Search completed for:
Search required by: 31st March 2013
Search completed on: 27th March 2013
Search completed by: Richard Bridgen

Importance of the use of aseptic technique for thyroid biopsy

Resources searched
NHS Evidence; TRIP Database; Cochrane Library; AMED; BNI; EMBASE; HMIC; MEDLINE; PsychINFO; Google Scholar

Database search terms: thyroid; thyroid*; THYROID GLAND; aseptic; ASEPSIS; asepsis; “sterile technique*”; sterile; biopsy; biopsies; sample adj2 tissue*; removal OR excision OR examination) adj2 (“sample tissue* OR "tissue sample" OR "specimen" of tissue" OR tissue specimen*”); exp BIOPSY; biops* conisation; conisation; tissue adj2 specimen*; sample* adj2 tissue*; clean; asep*; procedure*; technique*;

Evidence search string(s): (asep* OR sterile OR clean) biop* thyroid

Google search string(s): thyroid ~biopsy (~aseptic OR sterile OR clean)

Summary
There is limited research on aseptic techniques in thyroid biopsy. Some of the guidance refers to the handling of samples once removed from the patient. Given the general paucity of evidence, I have also included some research on aspepsis in biopsy more generally.

Informed consent: I have not been able to find any specific guidance, so have included some general references to informed consent in the last section on page 9.
Guidelines
Gastroenterological Society of Australia
Infection control in endoscopy (3rd edition) 2010

Health Protection Agency
Investigation of Bone and Soft Tissue Associated with Osteomyelitis 2012
Investigation of Tissues and Biopsies 2012
Investigation of Gastric Biopsies for Helicobacter pylori 2012
All state:
1 Specimen Collection, Transport and Storage
1.1 Safety considerations
Use aseptic technique.

Evidence-based reviews
Cardiovascular and Interventional Radiology
Does prebiopsy, nonsterile ultrasonography gel affect biopsy-site asepsis?

TRIP Answers
Please could you let me know if it is better to clean a wound before taking a swab for culture and sensitivity - and the rational behind it - thank you 2006

Great Ormond Street Hospital for Sick children
Skin biopsy: punch method 2012
An aseptic non-touch technique should be employed throughout the procedure (Rationale 7).

Published research
1. Infectious thyroiditis as a complication of fine-needle biopsy: A systematic review
Author(s) Polyzos S.A., Anastasilakis A.D.
Citation: Expert Review of Endocrinology and Metabolism, September 2010, vol./is. 5/5(673-679), 1744-6651 (September 2010)
Publication Date: September 2010
Abstract: Thyroid fine-needle biopsy (FNB) is a simple, reliable and inexpensive procedure for the diagnosis of thyroid malignancy. Furthermore, it is a useful tool for the identification of the causative pathogen in cases of acute suppurative thyroiditis. However, it can also cause infectious thyroiditis, as bacterial seeding can occur. Post-FNB thyroid infection is a rare complication. Gram-positive bacteria predominate but other bacteria have also been isolated, especially in immunocompromised patients. Preventive measures include iodine skin preparation and alcohol cleansing of the skin before FNB and adequate aseptic conditions. The prognosis of post-FNB infectious thyroiditis depends on prompt recognition and treatment. The treatment of choice is antibiotics and pus drainage, but thyroid resection may be required in cases of persistent infection. 2010 Expert Reviews Ltd.
Source: EMBASE
2. Reduction in bacteremia rates after rectum sterilization before transrectal, ultrasound-guided prostate biopsy: A randomized controlled trial

**Author(s)** Kanjanawongdeengam P., Viseshsindh W., Santanirand P., Prathombut P., Nilkulwattana S.

**Citation:** Journal of the Medical Association of Thailand, December 2009, vol./is. 92/12(1621-1626), 0125-2208;0125-2208 (December 2009)

**Publication Date:** December 2009

**Abstract:** Objective: To determine the efficacy of rectum sterilization before TRUS guided prostate biopsy in order to decrease bacteremia rate and sepsis complication.

Material and Method: From August 2008 to March 2009, 100 volunteers who had an indication for prostate biopsy were recruited into the present study in a randomized controlled trial. The present study was approved by the Ethics Committee on Human Experimentation of Ramathibodi Hospital Faculty of Medicine, Mahidol University. The volunteers received unison enema one day before and Ciprofloxacin 500 mg 0.5-1 hr before the procedure. These 100 volunteers were divided into two groups; 50 were randomly assigned in the group of rectum cleaning with 10% povidone-iodine, whereas the other 50 volunteers were placed in the control group. Twelve cores of TRUS guided prostate biopsy were performed. After the procedure, peripheral blood samples were taken for cultures for aerobic and anaerobic bacteria. A clinical follow-up at 48-72 hrs after the procedure was done via telephone. Results: Hemocultures were positive for 9 cases in the rectum cleaning group and 2 cases in the control group (p = 0.025). Three volunteers (one in the rectum cleaning group and two in the control group) had a post-operative fever but it spontaneously resolved. Two volunteers in the control group came back to the hospital because of urinary tract infections and rectal bleeding. None of the volunteers had clinical sepsis or went to other hospitals. Conclusion: Sterilization of the rectum before TRUS guided prostate biopsy was found to reduce post-operative bacteremia and might reduce clinical infections.

**Source:** EMBASE

3. Thyroid abscess as a complication of fine-needle aspiration biopsy

**Author(s)** Halenka M., Skodova I., Horak D., Kucerova L., Karasek D., Frysak Z.

**Citation:** Endocrinologist, November 2008, vol./is. 18/6(263-265), 1051-2144 (November-December 2008)

**Publication Date:** November 2008

**Abstract:** Thyroid abscess is a rare condition with a dramatic clinical course. Most commonly, thyroid abscess develops in a multinodular goiter. Rarely, the infection is iatrogenic. This report describes an abscess developing after fine-needle aspiration biopsy. The infectious agent was Escherichia coli, not a typical skin pathogen. The patient's condition required intubation and temporary tracheostomy. The case underlines the necessity of adhering to strict aseptic technique even in minimally invasive procedures.

2008 Lippincott Williams & Wilkins, Inc.

**Source:** EMBASE

4. Does prebiopsy, nonsterile ultrasonography gel affect biopsy-site asepsis?

**Author(s)** Gurel K., Karabay O., Gurel S., Hildebolt C.

**Citation:** CardioVascular and Interventional Radiology, January 2008, vol./is. 31/1(131-134), 0174-1551 (January 2008)

**Publication Date:** January 2008

**Abstract:** Purpose: The purpose of this study was to determine the extent to which the use of nonsterile gel, prior to antiseptic procedures in ultrasonography (US)-guided percutaneous biopsies, results in contamination of the biopsy site. Materials and Methods: Patients referred for US-guided percutaneous biopsies were included in this study. Transmission material used for US evaluation before biopsy-site antiseptic procedures were performed was either nonsterile gel or sterile saline. Patients were randomly assigned to two groups: nonsterile gel (n = 30) and sterile saline (n = 30). Before the transmission
material was used and after antiseptic procedures were performed, microbial swabs of a 10-cm diameter area were obtained at the biopsy site. Swabs were also obtained from the gel, saline, and povidine-iodine. Inoculated specimen plates were incubated at 37°C under aerobic conditions, and the numbers of colony-forming units recorded. Nonlinear logistic regression analysis was used to calculate the odds of postantisepsis bacterial growth (after antiseptic procedures were performed) based on group, gender, coincidental disease (diabetes, chronic renal failure, and malignancy), biopsy-site location (head and neck or breast and abdomen), and local factors (skin fold, skin tag, and hair). Results: The following odds ratios (adjusted for the other variables) and their 95% confidence intervals were calculated: (1) group (2.9 [0.8-11.1]; p = 0.10); (2) gender (1.2 [0.3-5.2]; p = 0.78); (3) coincidental disease (7.6 [0.9-166.7]; p = 0.09); (4) biopsy site location (6.2 [1.4-31.3]; p = 0.02); and (5) local factors (7.0 [1.6-36.0]; p = 0.01). No bacterial growth occurred with swabs obtained from gel, povidine-iodine, or saline.

Conclusion: We conclude that nonsterile gel used prior to percutaneous biopsy does not affect biopsy-site asepsis. 2007 Springer Science+Business Media, LLC.

Source: EMBASE
Available in fulltext from CardioVascular and Interventional Radiology at EBSCOhost

5. Secondary infection and ischemic necrosis after fine needle aspiration for a painful papillary thyroid carcinoma: a case report.

Author(s) Chen HW, Tseng FY, Su DH, Chang YL, Chang TC
Citation: Acta Cytologica, March 2006, vol./is. 50/2(217-20), 0001-5547;0001-5547 (2006 Mar-Apr)
Publication Date: March 2006

Abstract: BACKGROUND: Papillary thyroid carcinoma (PTC) is often asymptomatic and rarely presents as a painful goiter. Further, the thyroid gland is not easily infected. Therefore, acute suppurative thyroiditis (AST) is unusual. PTC is also seldom combined with AST. We report a case of painful PTC with secondary infection after fine needle aspiration (FNA). CASE: A 19-year-old girl complained of a painful goiter without skin change after an episode of upper airway infection. PTC was diagnosed according to the FNA cytology (FNAC) at another hospital. The goiter became more painful after FNA. The patient's second FNAC at our hospital revealed only many polymorphonuclear leukocytes (PMNs). Antibiotic treatment ameliorated the pain, but the goiter persisted. The third FNAC revealed some PMNs and papillary carcinomatous cells. After total thyroidectomy, pathology revealed ischemic necrosis with a focal PMN aggregation around the needle track and papillary carcinomatous cells nearby. According to the time sequence, secondary infection after FNA was suspected. CONCLUSION: A painful goiter is an unusual presentation of PTC. Although FNAC is feasible for studying a thyroid lesion, malignant cells might be missed when secoandary injection and ischemic necrosis occur after FNA. Therefore, aseptic procedures are necessary to prevent bacteria from seeding into the thyroid.

Source: Medline

6. Biopsy of musculoskeletal tumours

Author(s) Dickinson I.C., Duggal A., Choong P.F.M.
Citation: ANZ Journal of Surgery, July 2004, vol./is. 74/7(511-512), 1445-1433 (July 2004)
Publication Date: July 2004
Source: EMBASE
Available in fulltext from ANZ Journal of Surgery at EBSCOhost

7. Biopsy of lesions of the female genital tract in the ambulatory setting

Author(s) Irvin W., Taylor Jr. P.
Citation: Journal of Long-Term Effects of Medical Implants, 2004, vol./is. 14/3(185-199),
Abstract: The organs of the female genital tract (vulva, vagina, cervix, uterus, ovaries, and fallopian tubes) are capable of elaborating an immense array of pathologic conditions. These conditions can be primarily infectious in nature, or they can be neoplastic, precancerous, or frankly cancerous. In most instances the patient's history and physical examination alone are insufficient to establish a diagnosis, given the extreme similarity in clinical presentation of the various abnormalities of the female genital tract and the subtle differences that distinguish one from the other. In order to definitively establish the diagnosis, it is often necessary to obtain a tissue sample. Most clinicians are intimidated at the prospect of performing a biopsy of the lower female genital tract given concerns for patient discomfort and bleeding, in conjunction with a lack of familiarity with the specific techniques and instruments available to perform these biopsies. Conditions may go undiagnosed, or there may be a significant delay in diagnosis, as a result. In fact, failure to biopsy and obtain an accurate diagnosis in a timely fashion is a major concern from the medicolegal perspective. There is an increasing emphasis upon ambulatory care in our society. For this reason, it is essential that the clinician be familiar with the techniques that permit safe and reliable tissue diagnosis in the outpatient setting. This article is intended to describe the various techniques available to biopsy the organs of the female genital tract, as well as the instruments designed and uniquely suited for that purpose. An extensive Medline search was performed from the years 1965-2003, cross-referencing the terms "biopsy techniques" and "organs of the female genital tract." The results of this analysis detail both incisional and excisional biopsy techniques that can be safely employed by the clinician in the out-patient or ambulatory settings to obtain tissue samples to aid in initial diagnosis, or to accomplish therapeutic excision in order to definitively address a previously known condition. Being aware of the various biopsy techniques available for the outpatient evaluation of the female genital tract, and being comfortable with their use, increases the likelihood that abnormalities of the reproductive organs will be expeditiously evaluated, accurately diagnosed, and appropriately treated in a timely fashion.

Source: EMBASE

8. Excisional biopsy of skin tumors

Author(s) Edlich R.F., Becker D.G., Long W.B., Masterson T.M.

Citation: Journal of Long-Term Effects of Medical Implants, 2004, vol./is. 14/3(201-214), 1050-6934 (2004)

Abstract: The most frequently encountered neoplasm in the US is skin cancer. More than 600,000 new cases of malignant skin tumors are diagnosed in the US each year. One standard method of treatment of skin tumors is excisional biopsy. There are seven technical considerations involved in the excisional biopsy of skin tumors: (1) aseptic technique, (2) examination and demarcation of skin lesion, (3) skin biomechanical properties, (4) anesthesia, (5) excisional biopsy, (6) wound closure, and (7) postoperative care. The physician must use aseptic techniques and wear a cap, mask, and powder-free gloves. Hair is a source of wound contamination, and removal of hair prevents it from becoming entangled in suture and the wound during closure. Because surgical electric clippers cut hair close to the skin surface without nicking the skin, we now use only electric clippers to remove hair. The physician's visualization of the wound can be enhanced by magnification (2.5x) loupes. The physician's plan for excisional biopsy is dictated by the suspected pathology of the skin lesion. The ultimate appearance and function of a scar after closure of excisional biopsy can be predicted by the static and dynamic skin tensions on the surrounding skin. Infiltration anesthesia is preferred over regional nerve block because it does not interfere with the muscle movement that causes dynamic tensions, which elongate the configuration of the defect. Most skin lesions are amenable to a circular excision. In these instances, it is worthwhile to use circular-shaped excisions. The reusable metal trephines have been replaced by disposable trephines that have ribbed plastic handles attached to 316 stainless steel circular cutting blades. Wound closure is accomplished in the same direction as the long axis of the elliptical defect by first approximating the midportion of the defect with a 4-0 synthetic CAPROSYN* monofilament absorbable suture attached to the swage of the laser-drilled, compound-curved reverse
cutting edge needle. Additional interrupted dermal (subcuticular) sutures are placed in each
wound quadrant to approximate further the divided edges of the dermis. Compound-curved
reverse cutting edge needles have been specifically designed for dermal closure.
Reinforced Steri-Strips are then applied transversely across the incision to facilitate further
skin edge approximation. Rigorous follow-up examination is essential for any patient with a
history of a skin cancer to detect recurrence and prevent further actinic damage. The use of
wide diameter trephine biopsy instruments are still not widely used by physicians because
most physicians do not have the technical skills to approximate the defect with dermal
sutures. Consequently, this need for a rapid dermal skin closure technique that can be
used by a primary care physician must be devised before the trephine excisional biopsy
technique is widely used by the primary care physician. This goal can be achieved by
developing a disposable stapler for subcuticular closure of the skin.

Source: EMBASE

9. The Role of Blind Protected Specimen Brushing (PSB) in Intubated Patients

Author(s) Yoo H.S., Hong J.H., Yoon J.U., Eom K.-S., Lee J.M., Kim C.H., Jang S.H., Kim
D.G., Lee M.G., Hyun I.G., Jung K.-S.

Citation: Tuberculosis and Respiratory Diseases, July 2003, vol./is. 55/1(59-68), 0378-
0066 (July 2003)

Publication Date: July 2003

Abstract: Background: In intubated patients, cultures of endotracheal aspirates (EA) are
apt to contamination throughout the endotracheal tube. Therefore, the identification of
etiologic agents via conventional EA cultures is not always reliable. In order to differentiate
a pulmonary infection from a non-infectious disease, and to identify the true etiologic agent
of acute pulmonary infection, blinded protected specimen brushing (PSB) was used, and its
efficacy evaluated. Methods: In 51 intubated patients, with suspected pneumonia, blind
PSB were performed, and the results compared with blood and EA cultures. A protected
specimen brush was introduced through the endotracheal tube, and settled at the affected
large bronchus. A specimen brush was introduced to the expected region using the blind
method. The tip of the brush was introduced with an aseptic technique after vigorously
mixed for 1 minute in 1cm<sup>3</sup> of Ringer's lactate solution. The specimens were
submitted for quantitative culture within 15 minutes, with a culture being regarded as
positive if the colony forming units were above 10<sup>3</sup>/ml. Results: Of the 51
patients, 15 (29.4%) had community-acquired pneumonia (CAP), 27 (52.9%) hospital-
acquired pneumonia (HAP) and 9 (17.6%) non-infectious diseases. The sensitivity and
specificity of the quantitative PSB culture for the diagnosis of pneumonia were 52.4 and
88.9%, respectively. The sensitivity and specificity of EA were 78.6 and 77.8%,
respectively. The blind PSB was superior to the EA for the identification of true etiologic
agents. Of 53 episodes of 27 HAP patients, MRSA (Methicillin-resistant staphylococcus
aureus) (41.5%) was the most common causative agent followed by Pseudomonas
aeruginosa (15.1%), Klebsiella sp. (7.5%) and Acinetobacter sp. (7.5%). Conclusions: As a
simple, non-invasive diagnostic modality, the blind PSB is a useful method for the
differentiation of a pulmonary infection from non-infectious diseases and to identify the
etiologic agents in intubated patients. A blind PSB can be performed without bronchoscopy,
so is safer, more convenient and cost-effectiveness for patients where bronchoscopy can
not be performed.

Source: EMBASE

10. Fusiform excision

Author(s) Zuber T.J.

Citation: American Family Physician, April 2003, vol./is. 67/7(1539-1544+1547-
1548+1550+1553-1554), 0002-838X (01 Apr 2003)

Publication Date: April 2003

Abstract: The fusiform excision technique is commonly used by physicians for removing
skin and subcutaneous lesions. The technique requires basic skills in anesthetic
administration, lesion excision, and suture closure. Physicians experienced in skin surgery
can often perform the procedure unsupervised after two to five precepted sessions. The fusiform excision technique should be used to biopsy any suspicious pigmented lesions because prognosis may depend on the depth of the lesion. A properly designed fusiform excision has a length-to-width ratio of 3 to 1 and produces a 30-degree angulation at both edges of the wound. The skin edges should be everted during the closure to improve final scar appearance. Malignant growths may require a second procedure to provide a wider margin of excision around the lesion. Post-excisional wound infections are uncommon with use of proper aseptic technique. Copyright 2003 American Academy of Family Physicians.

Source: EMBASE
Available in fulltext from American Family Physician at EBSCOhost

11. Anaerobic thyroid abscess from a thyroid cyst after fine-needle aspiration.

Author(s) Sun JH, Chang HY, Chen KW, Lin KD, Lin JD, Hsueh C

Citation: Head & Neck, January 2002, vol./is. 24/1(84-6), 1043-3074;1043-3074 (2002 Jan)

Publication Date: January 2002

Abstract: BACKGROUND: Anaerobic abscess formation within a thyroid cyst is rare but still possible, although aerobic thyroid abscess formation in the thyroid gland after fine-needle aspiration (FNA) has been observed in immunocompromised patients.METHODS: This study describes the clinical manifestations, thyroid echography, cytologic finding, culture outcome, and treatment course of an anaerobic abscess formation within a thyroid cyst after FNA in a healthy subject.RESULTS: A 53-year-old male subject had rapid enlargement of a left thyroid cyst develop after second FNA. Frank pus was obtained through third FNA. The culture outcome was Propionibacterium acnes, which was rich in saliva and one of the pathogens causing periodontitis and gingivitis. After adequate antimicrobial therapy, the abscess gradually diminished.CONCLUSIONS: This article reported, for the first time, on the formation of an anaerobic thyroid abscess after FNA in a healthy subject. We recommended careful aseptic procedure and adequate isolation processes, such as wearing a mask to avoid an unfavorable outcome as a result of a bacterial infection. Copyright 2002 John Wiley & Sons, Inc.

Source: Medline

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Ultrasonographically guided thyroid biopsy: a review with emphasis on technique.
P Rausch, K Nowels, RB Jeffrey - Journal of ultrasound in …, 2001 - Am inst Ultrasound Med
... The nodule for biopsy is localized in 80 J Ultrasound Med 20:79–85, 2001
Ultrasonographically Guided Thyroid Biopsy Figure 1. Biopsy equipment. Note that the 10-MHz linear array is covered with sterile plastic wrap and affixed to the transducer with sterile rubber bands. ...
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Sonography and sonographically guided fine-needle aspiration biopsy of the thyroid gland: indications and techniques, pearls and pitfalls
RL Titton, DA Gervais, GW Boland... - American Journal of …, 2003 - Am Roentgen Ray Soc
... can be taken in anxious patients to optimize patient cooperation during a thyroid biopsy? ... anxious, the radiologist can significantly affect the patient's perceived overall biopsy experience. ... patients become uncomfortable when their face is covered by the sterile drape, reporting ...
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Clinical complications following thyroid fine-needle biopsy: a systematic review

SA Polyzos, AD Anastasilakis - Clinical endocrinology, 2009 - Wiley Online Library

Sterile gel in US-FNB. Needle track seeding (papillary carcinoma: 0-14%/3; follicular carcinoma: 1/3; anaplastic carcinoma: 1/3; other thyroid malignancies: no evidence), Small needle size (23-G ... Cited by 21 Related articles All 6 versions Cite

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A Carpi, A Nicolini, C Marchetti, G Iervasi... - ..., 2007 - Wiley Online Library

10,11, 13 Ultrasound-guided LNAB or LNCB with a biopsy gun (both employing a 18 ... 11,13 The LNCB technique has been abandoned because it requires a sterile environment and ... Table 1 shows the studies of thyroid nodules with LNCB or LNAB without ultrasound guidance ... Cited by 16 Related articles BL Direct All 5 versions Cite

The Thyroid Nodule Fine-Needle Aspiration Biopsy Technique

JC Crockett - Journal of Ultrasound in Medicine, 2011 - Am inst Ultrasound Med

An ultrasound machine with a high-resolution linear array thyroid probe. We decide which is the best position of the ultrasound probe to be used for the biopsy or biopsies before to ... Note: Some people place a sterile sheath or condom over the ultrasound probe, but we do not. ... Cited by 5 Related articles All 5 versions Cite

Thyroid nodules-stepwise diagnosis and management

SA Polyzos, M Kita, A Avramidis - HORMONES ATHENS-, 2007 - hormones.gr

Aseptic conditions are necessary to prevent bacteria from seeding into the thyroid. ... sterile conditions and continuous US-guidance, a laser fiber is positioned in the ... Rausch P, Nowels K, Jeffrey RB Jr, 2001 Ultrasonographically guided thyroid biopsy: a review with ... Cited by 57 Related articles BL Direct All 5 versions Cite More

Informed Consent

Portable video media for presenting informed consent and wound care instructions for skin biopsies: a randomized controlled trial

Royal College of Nursing

Informed Consent Guidance

British Medical Association

Consent tool kit - fifth edition 2009

General Medical Council

Consent guidance: patients and doctors making decisions together 2008
I. INTRODUCTION.

Informed consent to medical treatment is a vexed topic; medically, legally, and ethically. Consent is underpinned by the notion of personal...