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**Complication details**

Complication of HALO (haemorrhoid artery ligation operation)

**Resources searched**

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

**Database search terms:** haemorrhoid* artery ligation operation*; “hemorrhoid* artery ligation operation*”; HALO; ARTERIES/su; exp HEMORRHOIDS; ligat*; exp LIGATION; exp ARTERIES; haemorrhoid*; hemorrhoid*; pile*; artery; arteries; “blood vessel*”; capillar*; vein*; microvessel*; exp BLOOD VESSELS; complication*; “adverse effect; “side effect; recurrence*; rebleeding; re-bleeding; infect*; “anal fistula*”; incontinen*; exp COMPLICATION; exp SIDE EFFECT; RECURRENT DISEASE; exp SURGICAL INFECTION; exp ANUS FISTULA; exp INCONTINENCE; exp POSTOPERATIVE COMPLICATIONS; exp RECURRENCE; exp SURGICAL WOUND INFECTION; exp RECTAL FISTULA; exp FECAL INCONTINENCE

**Evidence search string(s):** 

- ((HALO haemorrhoid) OR "haemorrhoid artery ligation") / (haemorrhoidal OR hemorrhoidal) "artery ligation"

**Google search string(s):**

- "hemorrhoidal artery ligation" OR "haemorrhoidal artery ligation" / ((HALO hemorrhoidal) OR "hemorrhoidal artery ligation")

**Summary**

If you are looking for HALO specifically then there is not much research, see studies 1 and 26. However there is a lot of research looking at doppler guided haemorrhoid artery ligation, which seems to be the same as the HALO technique, and this research is much more numerous with a lot of information on complications.
Guidelines and Policy

NICE
IPG342 Haemorrhoidal artery ligation 2010

In a systematic review of 17 studies with a total of 1996 patients, a subset of 6 studies with a follow-up of 1 year or more (850 patients treated by the procedure) reported bleeding, pain on defaecation, and prolapse in 10% (49/507), 9% (18/206) and 11% (46/427) of patients respectively. A subset of 9 studies with a follow-up of less than 1 year (855 patients treated by the procedure) reported bleeding and prolapse in 6% (40/638) and 8% (50/638) of patients respectively. The proportion of patients with preoperative bleeding, pain and prolapse ranged from 45% to 100%, 12% to 83% and 12% to 100% respectively across the studies.

Evidence-based reviews

Clinical Knowledge Summaries
Haemorrhoids 2012

A review concluded that there is insufficient evidence to judge the effectiveness of this technique, although the mean hospital stay was shorter than after closed haemorrhoidectomy, and there were fewer post-operative complications.

Health Technology Assessment Database


Published research – Databases

1. Haemorrhoidal Artery Ligation Operation (HALO): Efficacy and patient satisfaction for symptomatic haemorrhoids including grade 4

Author(s) Sekhar H., Smart C., Saeed M.

Citation: Colorectal Disease, September 2013, vol./is. 15/(114), 1462-8910 (September 2013)

Publication Date: September 2013

Abstract: Aim: HALO is used to treat various grades of haemorrhoids and is less invasive than traditional surgical approaches. This study investigated the efficacy and patient satisfaction of the HALO for symptomatic haemorrhoids, particularly grade 4. Method: One hundred and twenty-seven HALOs were performed between January 2010 and March 2012 by a single surgeon. Clinical data was collected retrospectively and patient satisfaction was studied via a postal questionnaire. Results: Of 79/127 (62.2%) patients were asymptomatic at a median follow-up of 6 (2-44) weeks. 85/127 (67%) questionnaires were returned [22/33 (68%) for Grade 4] at a median of 16 (4-29) months. Return to normal activities took a median of 5 (1-38) days, with no significant difference between the haemorrhoidal grades (P = 0.85). 63/85 (74.1%) patients had no recurrence or minimal symptoms not interfering with quality of life, including 17/22 (77.2%) grade 4. There was no significant difference in patient satisfaction between haemorrhoidal grades (P = 0.46). 70/85 (81.1%) would undergo HALO again and 67/85 (77.9%) of patients recommend it, with haemorrhoidal grade not influencing this (P = 0.26, 0.137 respectively). Conclusion: HALO is successful in treating all grades of haemorrhoids, including grade 4. Patients describe quick recovery with the majority being asymptomatic at follow-up. Patient satisfaction is high and patients would undergo the procedure again if required as well recommend it to others.

Source: EMBASE

**Author(s)** Didnee A.-S., Lehur P.

**Citation:** Colorectal Disease, September 2013, vol./is. 15/(111), 1462-8910 (September 2013)

**Publication Date:** September 2013

**Abstract:** Aim: Doppler-guided haemorrhoidal artery ligation/mucopexy (DGALM), a recent option for symptomatic haemorrhoids has never been compared to stapled anopexy (SA)(Longo) in terms of cost-effectiveness. Trial hypothesis: DGALM is at lesser risk and therefore more cost-effective than SA. Report the results of "LigaLongo" trial (NCT01240772) at 2-week and 2-month follow-up. Method: Four hundred and seven patients with grade II/III haemorrhoids, recruited in 22 French centres were allocated to DGALM(203) or SA(204) and followed at regular intervals up to 1 year. Primary and relevant secondary endpoints were respectively: complication rate and type according to Clavien-Dindo at 2 post-operative months, operating time, length of stay and hospital cost, sick-leave. Results: Operative time and OR occupancy were longer by a median 14 min for DGALM. Hospital stay was comparable at a median one day and respectively for DGALM and SA at a cost 1670 and 1427. Complications usually minor occurred at a slightly higher rate and sick leave for those at work (63% of the series) was longer by a median 6 days in SA group. Conclusion: In this preliminary analysis, a difference in short-term outcome including complication rate failed to demonstrate a cost-difference between the 2 procedures. One-year results could modify the present conclusion.

**Source:** EMBASE

3. Haemorrhoid artery ligation and recto-anal-repair (HAL RAR): A two year case series from an Irish hospital setting

**Author(s)** Shabbaz M., Harrington C., Fearon N., Whelan M., Buckley D., Kavanagh D., Chaudhry S., Neary P.

**Citation:** Colorectal Disease, September 2013, vol./is. 15/(108), 1462-8910 (September 2013)

**Publication Date:** September 2013

**Abstract:** Aim: Symptomatic haemorrhoids have been safely and effectively treated with haemorrhoidal arterial ligation and Recto-Anal-Repair (HAL-RAR) instead of open haemorrhoidectomy in several countries. Irish experience is limited. Method: A retrospective review of all patients that underwent the HAL RAR procedure over a two year period was performed. Patient demographics, satisfaction, outcomes and recurrence rates were collated via telephone communication. Results: Thirty nine patients underwent the procedure electively between April 2011 and April 2013 in a single tertiary centre in Ireland. All had symptomatic grade II or III haemorrhoids. All operations were completed under general anaesthesia as day case procedures. There were no major or minor intraoperative complications. Forty-nine percent of patients were male and the median age was 54 years old. Average Pain scores post-operatively were 4.8/10 on Day 7 and 1.1/10 on Day 21. All patients had complete resolution of symptoms and return to the previous lifestyle within 2 weeks, except one who was still symptomatic at 3 weeks. There were no late complications. Six percent of patients reported a recurrence of symptoms at 12 months. Conclusion: In our experience, HAL RAR is a less invasive procedure than traditional methods with favourable efficacy and safety profile.

**Source:** EMBASE


**Author(s)** Ahmad A, Kant R, Gupta A

**Citation:** Indian Journal of Surgery, August 2013, vol./is. 75/4(274-7), 0972-2068;0973-
Abstract: Both Doppler-guided hemorrhoidal artery ligation (DG-HAL) and infrared coagulation (IRC) are well-established techniques in the management of hemorrhoids. The aim of the study is to compare the clinical outcomes of DG-HAL and IRC in the patients with grade 1 and 2 hemorrhoids. A total of 296 patients were registered for the study, but 51 patients were lost in follow-up; hence, finally 245 patients were included in the analysis. Patients were randomized into two groups (mean age, 42 years; range, 19-60 years). Group A (n=116) was treated with DG-HAL and group B (n=129) was treated with IRC. Patients were examined at 1 week, 1 month, and 6 months after the procedure. Mean time taken for HAL was 21 min and for IRC, 12 min. The cost of the DG-HAL procedure was 1,440 rupees ($31.53) and that of IRC was 376 rupees ($8). The mean duration of hospital stay after HAL was 6 h and after IRC, 2 h. Control of symptoms with HAL was 96 %, whereas with IRC, 81 %. Postoperative complication rate for HAL was 2 %, whereas for IRC, 13 %. Requirement of repeat procedure with HAL was 9 % and with IRC, 28 %. Both the procedures are minimally invasive, associated with minimal discomfort, and suitable for day care surgery. IRC requires lesser procedure time, lesser postoperative hospital stay, and has lower procedure cost, whereas DG-HAL is more effective in controlling symptoms of hemorrhoids, has lower postoperative complication rate, and has lesser requirement of repeat procedure.

Source: Medline

5. Approach to hemorrhoids

Author(s) Lohsiriwat V.

Citation: Current gastroenterology reports, July 2013, vol./is. 15/7(332), 1534-312X (Jul 2013)

Publication Date: July 2013

Abstract: Hemorrhoids are a very common anorectal disorder defined as the symptomatic enlargement and abnormally downward displacement of anal cushions. The current pathophysiologies of hemorrhoids include the degenerative change of supportive tissue within the anal cushions, vascular hyperplasia, and hyperperfusion of hemorrhoidal plexus. Low-grade hemorrhoids are easily and effectively treated with dietary and lifestyle modification, medical intervention, and some office-based procedures. An operation is usually indicated in symptomatic high-grade and/or complicated hemorrhoids. Whilst hemorrhoidectomy has been the mainstay of surgical treatment, more recently other approaches have been employed including Ligasure hemorrhoidectomy, stapled hemorrhoidopexy, and doppler-guided hemorrhoidal artery ligation. Post-procedural pain and disease recurrence remain the most challenging problems in the treatment of hemorrhoids. This article deals with modern approaches to hemorrhoids based on the latest evidence and reviews of the literature. The management of hemorrhoids in complicated situations is also discussed.

Source: EMBASE

6. Clinical outcome following Doppler-guided haemorrhoidal artery ligation: A systematic review

Author(s) Pucher P.H., Sodergren M.H., Lord A.C., Darzi A., Ziprin P.

Citation: Colorectal Disease, June 2013, vol./is. 15/6(e284-e294), 1462-8910;1463-1318 (June 2013)

Publication Date: June 2013

Abstract: Aim: Doppler-guided haemorrhoidal artery ligation (DGHL) has experienced wider uptake and has recently received National Institute for Health and Clinical Excellence (NICE) approval in the UK. A systematic review of the literature was conducted to assess its safety and efficacy. Method: This review was conducted in keeping with PRISMA guidelines. MEDLINE, EMBASE, Google Scholar and Cochrane Library databases were searched. Studies describing DGHL as a primary procedure and reporting clinical outcome
were considered. Primary end-points were recurrence and postoperative pain. Secondary end-points included operation time, complications and reintervention rates. Studies were scored for quality with either Jadad score or NICE scoring guidelines. Results: Twenty-eight studies including 2904 patients were included in the final analysis. They were of poor overall quality. Recurrence ranged between 3% and 60% (pooled recurrence rate 17.5%), with the highest rates for grade IV haemorrhoids. Postoperative analgesia was required in 0-38% of patients. Overall postoperative complication rates were low, with an overall bleeding rate of 5% and an overall reintervention rate of 6.4%. The operation time ranged from 19 to 35 min. Conclusion: DGHL is safe and efficacious with a low level of postoperative pain. It can be safely considered for primary treatment of grade II and III haemorrhoids. Colorectal Disease 2013 The Association of Coloproctology of Great Britain and Ireland.

Source: EMBASE

7. Hemorrhoidal artery ligation procedure with or without Doppler transducer in grade II and III hemorrhoidal disease: A blinded randomized clinical trial: Comments

**Author(s)** Wilkins K.B.

**Citation:** Diseases of the Colon and Rectum, April 2013, vol./is. 56/4(e55), 0012-3706;1530-0358 (April 2013)

**Publication Date:** April 2013

**Source:** EMBASE

Available in **print** at Grantham Hospital Staff Library

8. Preliminary experience with doppler guided hemorrhoidal artery ligation for management of hemorrhoids

**Author(s)** Ez R.

**Citation:** Surgical Endoscopy and Other Interventional Techniques, April 2013, vol./is. 27/(S447), 0930-2794 (April 2013)

**Publication Date:** April 2013

**Abstract:** Purpose: This study is to present our preliminary experience of the Doppler-guided hemorrhoidal artery ligation after operating 185 cases of symptomatic hemorrhoids

Methods: The study included 185 cases of hemorrhoids. One hundred twenty six patients had 3rd degree piles, 33 patients had 2nd degree and twenty six had 4th degree piles. Ninety eight cases were operated using KM25 doppler device, 82 cases operated using THD device and 5 cases using the hemodop device. A Doppler probe incorporated proctoscope was inserted under the lithotomy position and the location of the hemorrhoidal artery was identified. The identified artery was ligated as a ‘figure of eight’ method with an absorbable suture into the submucosa. In 63 cases rectanal repair (RAR) was added to the ligation when a significant prolapse was detected. In such cases the prolapsed hemorrhoidal pile was lifted at the rectal mucosa by continuous suture to 5 mm above the dentate line and tied. The procedure was repeated at the 1, 3, 5, 7, 9, and 11 o’clock positions. We evaluated post-operative hospital stay, degree of pain, time to return to work, and other complications including recurrence. Results: The patient’s mean age was 42 years and the follow-up period is between 3 months to 3 years. The degree of internal hemorrhoids was as follows: Grade II: 33, Grade III: 126, and Grade IV: 26. The mean operation time was 35 min and post-operative hospital stay was 1.1 days. The mean time it took to return to work was 1.8 days. There were no major complications and recurrence occurred in 17 cases. Pain and bleeding occurred in 25 cases having RAR. Conclusion: The DG-HAL is safe, effective and less painful procedure for the treatment of symptomatic hemorrhoids. Complications increase if the DGHAL is combined with RAR. Gaining experience and following some technical tricks improve the results and diminish complications.

**Source:** EMBASE
9. DG-RAR for the treatment of symptomatic grade III and grade IV haemorrhoids: A 12-month multi-centre, prospective observational study

**Author(s)**: Roka S., Gold D., Walega P., Lancee S., Zagriadsky E., Testa A., Kukreja A.N., Salat A.

**Citation**: European Surgery - Acta Chirurgica Austriaca, February 2013, vol./is. 45/1(26-30), 1682-8631;1682-4016 (February 2013)

**Publication Date**: February 2013

**Abstract**: Summary: Background: Ultrasound-guided techniques represent a new treatment option in the treatment of haemorrhoids. Doppler-guided haemorrhoidal artery ligation (DG-HAL) proved efficacious in early haemorrhoidal disease, but lacks efficacy for stages III/IV. For these patients, haemorrhoidal artery ligation (HAL) has been combined with a running suture to reduce prolapsing haemorrhoidal tissue (recto-anal repair (RAR)). Methods: A prospective observational study was conducted in 184 patients with grade III (58 %) or grade IV (42 %) haemorrhoids in seven coloproctological centres. Primary endpoints were the recurrence of symptoms and need of further treatment (medical or surgical). Results: Post-operative complications were seen in 8 % of patients. After a follow-up of 3 months, 91 % of patients were free of symptoms and 91 % of patients were satisfied with the result. After a follow-up of 12 months, 89 % of patients were free of symptoms and 88 % were satisfied with the result. Nineteen per cent of patients received further medical or surgical treatment. Conclusions: Doppler-guided recto-anal repair (DG-RAR) proves to be an effective treatment option for the treatment of advanced haemorrhoidal disease that shows equal results to other established treatment options.

2012 The Author(s).

**Source**: EMBASE

10. The effectiveness of Doppler controlled hemorrhoidal artery ligation based on preliminaries results

**Author(s)**: Yamoul R., Attolou G., Njoumi N., Alkandry S., Tahiri M.E.H.

**Citation**: Pan African Medical Journal, 2013, vol./is. 15/, 1937-8688 (2013)

**Publication Date**: 2013

**Abstract**: In this work, we discuss the preliminary results of the effectiveness of the hemorrhoidal artery ligation under control Doppler as a new technique for the treatment of hemorrhoids. We report the results of patients with hemorrhoids we have followed over a period of one year who were treated with HAL Doppler. The intra-and postoperative complications were monitored. Patient follow-up was established on the immediate postoperative period, after one month, six months and one year of evolution. Monitoring parameters were both objective (prolapse) and subjective (pain, discomfort, bleeding, satisfaction). 120 patients, all stages combined, were treated with HAL Doppler. The pain is easily controlled with painkillers. Residual rectal bleeding was noted in 3% of the cases. In addition, there was one case of recurrent prolapse which underwent reoperation. After one month, 86.5 % patients were satisfied. The hemorrhoidal artery ligation under control Doppler is an easy technique, well accepted by patients who are increasingly demanding it. It is less invasive, less painful and gives fewer complications. It is not only effective for stage III and IV hemorrhoids for which the effect is spectacular but also for stages I and II symptoms, which can expand its indications. Rajae Yamoul et al.

**Source**: EMBASE

Available in fulltext from Pan African Medical Journal, The at National Library of Medicine

11. French experience in the management of hemorrhoids by HAL Doppler

**Author(s)**: Nguyen V., Jarry J., Imperato M., Farthouat P., Michel P., Faucheron J.L.

**Citation**: Journal of visceral surgery, December 2012, vol./is. 149/6(412-416), 1878-7886 (Dec 2012)

**Publication Date**: December 2012
Abstract: The goal of this study was to prospectively evaluate the surgical management of hemorrhoids by Doppler-guided hemorrhoidal artery ligation (Doppler HAL). This study was conducted between April 2008 and September 2009. The Doppler HAL technique was performed in patients with grades II to IV, irrespective of whether they had previously undergone medical or instrumental management or not. The other demographics of the studied population, the operative and post-operative results as well as the functional outcome at one month and at one year were recorded prospectively and analyzed retrospectively. Sixty-one consecutive patients (mean age 45 [range 28-85]) underwent Doppler HAL. The mean duration of operation was 26 minutes [range 18-45]. The average number of ligations per patient was seven. Three patients left the hospital the same day, 51 patients were discharged on day 1 and five patients on day 2. Post-operative mortality was nil. The post-operative morbidity rate was 4.9%. Functional results evaluated at one month and one year showed that initial symptoms had disappeared in more than 78% of patients. The recurrence rate for hemorrhoidal related disease was 10.5% during the first year. Surgical treatment of hemorrhoids by the Doppler-guided hemorrhoidal artery ligation technique is minimally invasive, with low morbidity, and satisfactory short and medium term functional results. This technique represents a reliable surgical alternative to classical hemorrhoidectomy and hemorrhoidopexy in the therapeutic strategy of hemorrhoidal disease. Copyright 2012 Elsevier Masson SAS. All rights reserved.

Source: EMBASE

12. The HubBLE trial: haemorrhoidal artery ligation (HAL) versus rubber band ligation (RBL) for haemorrhoids

Author(s) Tiernan J., Hind D., Watson A., Wailoo A.J., Bradburn M., Shephard N., Biggs K., Brown S.

Citation: BMC Gastroenterology, October 2012, vol./is. 12/, 1471-230X (25 Oct 2012)

Publication Date: October 2012

Abstract: Background: Haemorrhoids (piles) are a very common condition seen in surgical clinics. After exclusion of more sinister causes of haemorrhoidal symptoms (rectal bleeding, perianal irritation and prolapse), the best option for treatment depends upon persistence and severity of the symptoms. Minor symptoms often respond to conservative treatment such as dietary fibre and reassurance. For more severe symptoms treatment such as rubber band ligation may be therapeutic and is a very commonly performed procedure in the surgical outpatient setting. Surgery is usually reserved for those who have more severe symptoms, as well as those who do not respond to non-operative therapy; surgical techniques include haemorrhoidectomy and haemorrhoidopexy. More recently, haemorrhoidal artery ligation has been introduced as a minimally invasive, non-destructive surgical option. There are substantial data in the literature concerning efficacy and safety of 'rubber band ligation including multiple comparisons with other interventions, though there are no studies comparing it to haemorrhoidal artery ligation. A recent overview has been carried out by the National Institute for Health and Clinical Excellence which concludes that current evidence shows haemorrhoidal artery ligation to be a safe alternative to haemorrhoidectomy and haemorrhoidopexy though it also highlights the lack of good quality data as evidence for the advantages of the technique. Methods/design: The aim of this study is to establish the clinical effectiveness and cost effectiveness of haemorrhoidal artery ligation compared with conventional rubber band ligation in the treatment of people with symptomatic second or third degree (Grade II or Grade III) haemorrhoids. Design: A multi-centre, parallel group randomised controlled trial. Outcomes: The primary outcome is patient-reported symptom recurrence twelve months following the intervention. Secondary outcome measures relate to symptoms, complications, health resource use, health related quality of life and cost effectiveness following the intervention. Participants: 350 patients with grade II or grade III haemorrhoids will be recruited in surgical departments in up to 14 NHS hospitals. Randomisation: A multi-centre, parallel group randomised controlled trial. Block randomisation by centre will be used, with 175 participants randomised to each group. Discussion: The results of the research will help inform future practice for the treatment of grade II and III haemorrhoids. Trial Registration: ISRCTN41394716. 2012 Tiernan et al.; licensee BioMed Central Ltd.

Source: EMBASE
13. Rectoanal repair versus suture haemorrhoidopexy: A comparative study on suture mucopexy procedures for high-grade haemorrhoids

Author(s) Theodoropoulos G.E., Michalopoulos N.V., Linardoutsos D., Stamopoulos P., Flessas I., Tsamis D., Zografos G.C.

Citation: Techniques in Coloproctology, June 2012, vol./is. 16/3(237-241), 1123-6337;1128-045X (June 2012)

Publication Date: June 2012

Abstract: Background The isolated application of Doppler-guided haemorrhoidal artery ligation (DGHAL) may fail due to the increased reprolapse rate for high-grade haemorrhoids. DGHAL has been combined with a proctoscopic-assisted transanal rectal mucopexy of the prolapsing tissue. The technique is called rectoanal repair (RAR) and is an evolution of various mucopexy and suture haemorrhoidopexy (SHP) techniques. A prominent external component may require minimal (muco-) cutaneous excision (MMCE) of protruding anoderm or minor cutaneous excision of skin tags. Methods Fifty-seven patients with symptomatic Goligher grade III and IV haemorrhoids underwent DGHAL followed by either RAR or SHP. In 26 cases, the addition of MMCE was necessary. Results No significant differences were observed between the two approaches with regards to pain scores measured with visual analogue scale (VAS). On postoperative day 1, mean pain score at rest was 5.81 (+2.23 SD) after SHP versus 5.08 (+2.35 SD) after RAR, while mean pain score at first defecation was 7.31 (+1.6 SD) versus 7.52 (+1.83 SD). There was no difference in the duration of analgesic requirements, postoperative complications and residual prolapse between the 2 procedures. The addition of MMCE did not affect postoperative pain nor analgesic requirements. With the exception of 8 patients who still had with skin tags or minimal protrusion, the remaining of patients (86 %) were asymptomatic and recurrence-free at an average follow-up of 20 months. Overall, 94.8 % of patients stated that they were satisfied with the results, and 91.2 % that they would repeat it if necessary. Conclusions Performance of either SHP or RAR after DGHAL is a safe and effective surgical tactic for advanced grade haemorrhoids. Our initial results do not confirm any superiority of RAR over traditional SHP. Springer-Verlag 2012.

Source: EMBASE

Available in fulltext at Techniques in Coloproctology; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

14. Hemorrhoidal artery ligation procedure with or without Doppler transducer in grade II and III hemorrhoidal disease: a blinded randomized clinical trial.

Author(s) Schuurman JP, Borel Rinkes IH, Go PM

Citation: Annals of Surgery, May 2012, vol./is. 255/5(840-5), 0003-4932;1528-1140 (2012 May)

Publication Date: May 2012

Abstract: OBJECTIVE: The aim of this study was to compare the outcome of the hemorrhoidal artery ligation procedure for hemorrhoidal disease with and without use of the provided Doppler transducer. BACKGROUND: Hemorrhoidal artery ligation, known as HAL
Hemorrhoidal artery ligation or THD (transanal hemorrhoidal dearterialization) procedure, is a common treatment modality for hemorrhoidal disease in which a Doppler transducer is used to locate the supplying arteries that are subsequently ligated. It has been suggested that the use of the Doppler transducer does not contribute to the beneficial effect of these ligation procedures.

**METHODS:** The authors conducted a single-blinded randomized clinical trial and assigned a total of 82 patients with grade II and III hemorrhoidal disease to undergo either a HAL/THD procedure without use of the Doppler transducer (non-Doppler group, 40 patients) or a conventional HAL/THD procedure (Doppler group, 42 patients). Primary endpoint was improvement of self-reported clinical parameters after both 6 weeks and 6 months. This study is registered at trialregister.nl and carries the ID number: NTR2139.

**RESULTS:** After 6 weeks and 6 months in both the non-Doppler and the Doppler group, significant improvement was observed with regard to blood loss, pain, prolapse, and problems with defecation (P < 0.05). The improvement of symptoms between both groups did not differ significantly (P > 0.05), except for prolapse, which improved more in the non-Doppler group (P = 0.047). There were more complications and unscheduled postoperative events in the Doppler group (P < 0.0005). After 6 months, 31% of the patients in the non-Doppler group and 21% in the Doppler group reported completely complaint free (P = 0.313).

**CONCLUSIONS:** The authors' findings confirm that the hemorrhoidal artery ligation procedure significantly reduces signs and symptoms of hemorrhoidal disease. The authors' data also show that the Doppler transducer does not contribute to this beneficial effect.

**Source:** Medline

Available in fulltext from Annals of Surgery at the ULHT Library and Knowledge Services' eJournal collection

15. Doppler-guided hemorrhoidal artery ligation: experience with 2 years follow-up.

**Author(s)** Yilmaz I, Sucullu I, Karakas DO, Ozdemir Y, Yucel E, Akin ML

**Citation:** American Surgeon, March 2012, vol./is. 78/3(344-8), 0003-1348;1555-9823 (2012 Mar)

**Publication Date:** March 2012

**Abstract:** Doppler-guided hemorrhoidal artery ligation (DGHAL) is a nonexcisional surgical technique for the treatment of hemorrhoidal disease, consisting of the ligation of the distal branches of the superior rectal artery, resulting in a reduction of blood flow and decongestion of hemorrhoidal plexus resulting in fibrosis. The aim of the study was to assess the efficacy and safety of DGHAL, define its indications, and identify its possible advantages and limitations for the treatment of second- and third-degree hemorrhoids. The procedure was performed using a specially designed proctoscope. The Doppler probe was used to locate all the terminal branches of hemorrhoidal arteries, which were then sutured. Patients were followed up for 2 years. From November 2006 to May 2009, 50 patients (29 female, mean age 38.2 years) underwent this procedure. The procedure was performed under local anesthesia. An average of five ligatures was placed. Average length of hospital stay was 2 hours and return to work was 2.5 days. The mean postoperative pain score was 1.72. There were no intra- or immediate postoperative major complications. In 44 patients (88%), surgery resolved the symptoms completely in a 2-year follow-up period. DGHAL is a safe and effective procedure. DGHAL can be the choice for second- and third-degree hemorrhoids with minimal postoperative pain and quick recovery.

**Source:** Medline

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16. Five-year follow-up of Doppler-guided hemorrhoidal artery ligation

**Author(s)** Avital S., Inbar R., Karin E., Greenberg R.

**Citation:** Techniques in coloproctology, February 2012, vol./is. 16/1(61-65), 1128-045X
Abstract: Doppler-guided hemorrhoidal artery ligation (DGHAL) was described as lower risk and a less painful alternative to hemorrhoidectomy. We report our experience and 5-year follow-up with this procedure. Between May 2003 and December 2004, 100 patients with symptomatic Grade II or III hemorrhoids underwent ultrasound identification and ligation of 6-8 terminal branches of the superior rectal artery above the dentate line by a single surgeon using local, regional, or general anesthesia. There were 42 men and 58 women (mean age 42 years, median duration of symptoms 6/3 years). A 10-point visual analog scale was used for postoperative pain scoring. Surgical and functional outcome was assessed at 6 weeks and 3 and 12 months after surgery, with long-term follow-up by a telephone questionnaire at 5 years after the procedure. The mean operative time was 19 min. Local anal block combined with intravenous sedation (n = 93) or general or spinal (n = 7) anesthesia was used. Only 5 patients were hospitalized overnight. There was no urinary retention, bleeding, or mortality in the immediate postoperative period. The mean pain score decreased from 2.1 at 2 h postoperatively to 1.3 on the first postoperative day. All patients had complete functional recovery by the third postoperative day. Ninety-six patients completed 12 months of follow-up. Eighty-five of these patients (89%) remained asymptomatic at 12 months, though this number dropped to 67/92 (73%) at 5 years. Long-term follow-up confirms the effectiveness of the DGHAL procedure for treatment for Grade II hemorrhoids. The DGHAL procedure alone seems less effective for Grade III hemorrhoids.

Source: EMBASE
Available in fulltext at Techniques in Coloproctology; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.
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17. Doppler-guided haemorrhoidal artery ligation in patients with Crohn's disease

Author(s) Karin E., Avital S., Dotan I., Skornick Y., Greenberg R.

Citation: Colorectal Disease, January 2012, vol./is. 14/1(111-114), 1462-8910;1463-1318 (January 2012)

Publication Date: January 2012

Abstract: Aim: The outcome of Doppler-guided haemorrhoidal artery ligation (DGHAL) was assessed in patients with Crohn's disease (CD) suffering from grade III haemorrhoids. Method: A retrospective study was carried out of patients with CD and symptomatic Grade III haemorrhoids treated by DGHAL. Perioperative and follow-up data were retrieved from our database of patients undergoing DGHAL. Results: The study included seven men and six women. The mean age was 34 years old. All had CD without anorectal involvement. The median duration of haemorrhoidal symptoms was 6.3 years. There was no mortality, new incontinence, faecal impaction, urinary retention, abscess formation or persistent pain following the procedure. Mean pain score based on a visual analogue scale (VAS) decreased from 2.4 at 24h postoperatively to 1.6 on the seventh postoperative day. All patients had completely recovered by the third postoperative day. At 18 months, three (77%) of the patients were asymptomatic and three had recurrent symptoms. Conclusion: Doppler-guided haemorrhoidal artery ligation is safe and effective in treating Grade III haemorrhoids in patients with CD without rectal involvement. 2011 The Authors. Colorectal Disease 2011 The Association of Coloproctology of Great Britain and Ireland.

Source: EMBASE
Available in fulltext from Colorectal Disease at EBSCOhost
Available in fulltext from Colorectal Disease at EBSCOhost

18. Doppler-guided hemorrhoid artery ligation with Recto-Anal-Repair modification:

Author(s) Walega P, Romaniszyn M, Kenig J, Herman R, Nowak W

Citation: Thescientificworldjournal, 2012, vol./is. 2012/(324040), 1537-744X;1537-744X (2012)

Publication Date: 2012

Abstract: PURPOSE: We present 12-month followup results of functional evaluation and safety assessment of a modification of hemorrhoidal artery ligation (DGHAL) called Recto-Anal-Repair (RAR) in treatment of advanced hemorrhoidal disease (HD).METHODS: Patients with grade III and IV HD underwent the RAR procedure (DGHAL combined with restoration of prolapsed hemorrhoids to their anatomical position with longitudinal sutures). Each patient had rectal examination, anorectal manometry, and QoL questionnaire performed before 3 months, and 12 months after RAR procedure.RESULTS: 20 patients completed 12-month followup. There were no major complications. 3 months after RAR, 5 cases of residual mucosal prolapse were detected (25%), while only 3 patients (15%) reported persistence of symptoms. 12 months after RAR, another 3 HD recurrences were detected, to a total of 8 patients (40%) with HD recurrence. Anal pressures after RAR were significantly lower than before (P < 0.05), and the effect was persistent 12 months after RAR. One patient (5%) reported occasional soiling 3 months after RAR.CONCLUSIONS: RAR seems to be a safe method of treatment of advanced HD with no major complications. The procedure has a significant influence on anal pressures, with no evidence of risk of fecal incontinence after the operation.

Source: Medline
Available in fulltext from Scientific World Journal at EBSCOhost

19. One Year Follow-up Result of Doppler-guided Hemorrhoidal Artery Ligation and Recto-Anal Repair in 97 Consecutive Patients.

Author(s) Jeong WJ, Cho SW, Noh KT, Chung SS

Citation: Journal of the Korean Society of Coloproctology, December 2011, vol./is. 27/6(298-302), 2093-7822;2093-7830 (2011 Dec)

Publication Date: December 2011

Abstract: PURPOSE: Doppler-guided hemorrhoidal artery ligation and recto-anal repair (DG-HAL & RAR) is known for low recurrence, high patient satisfaction, and less postoperative pain. The purpose of this study is to analyze the 1-year follow-up results in patients who underwent a DG-HAL & RAR and to establish the benefits of the procedure.METHODS: Among the hemorrhoid patients who were admitted to our hospital from March 2008 to May 2010 and who underwent a DG-HAL & RAR, 97 patients who were followed up for a year were investigated. Recurrence, complications, admission period, difference in preoperative and postoperative pain, operation time, and time to return to daily activities were investigated.RESULTS: The average admission period was 1.6 + 1.1 days. Pain at postoperative day 7 showed no significant difference from preoperative pain (P > 0.05). The operation time was 34.0 + 7.3 minutes on average, and return to daily activities was timed at 2.3 + 2.0 days postoperatively. At the one year follow-up, no serious complications were noted, and preoperative symptoms recurred only in 14 patients (14.4%).CONCLUSION: In most patients with hemorrhoids, excluding those with severe prolapsed hemorrhoids, less pain, no serious complications, and good long-term outcome can be expected from a DG-HAL & RAR.

Source: Medline
Available in fulltext from Journal of the Korean Society of Coloproctology at National Library of Medicine

20. Comparison of Doppler-guided haemorrhoidal artery ligation without mucopexy and rubber band ligation for haemorrhoids

Author(s) Pol R.A., van der Zwet W.C., Kaijser M., Schattenkerk M.E., Eddes E.-H.
Background and study aims: Recurrences after Doppler-guided haemorrhoidal artery ligation (DG-HAL) tend to occur in patients with concurrent mucosal prolapse. We retrospectively compared the results of DG-HAL and rubber band ligation (RBL) for the treatment of haemorrhoidal disease. Patients and methods: From 2005 to 2009, all patients who underwent either a DG-HAL procedure or RBL were selected. Follow-up was done by telephone using a standardised questionnaire survey to assess patient satisfaction and complaints. When recurrent disease was suspected, patients revisited the clinic for further examination and treatment. Results: A total of 239 DG-HAL patients and 47 RBL patients were analysed. Sixty-seven percent in the DG-HAL group and 79% in the RBL group had an improvement in symptoms after one treatment (p= 0.22). Forty-six DG-HAL patients (19%) needed a second procedure versus three patients (6%) in the RBL group (p< 0.05). Cox regression analysis showed a significant difference in disease recurrence in favour of RBL (hazard ratio (HR) 3.71, 95% confidence interval (CI) 1.13-12.2). Patients in the DG-HAL group with recurrent haemorrhoids had a higher incidence of mucosal prolapse. Conclusion: DG-HAL seems very effective in treating lower-grade haemorrhoids. In more advanced disease, recurrence occurs due to persisting mucosal prolapse. RBL seems much more effective in reducing the prolapse and the chance of recurrence. 2011 Arab Journal of Gastroenterology.

Source: EMBASE

21. Doppler-guided hemorrhoidal artery ligation does not offer any advantage over suture ligation of grade 3 symptomatic hemorrhoids

Author(s) Gupta P.J., Kalaskar S., Taori S., Heda P.S.

Citation: Techniques in Coloproctology, December 2011, vol./is. 15/4(439-444), 1123-6337;1128-045X (December 2011)

Publication Date: December 2011

Abstract: Background: Doppler-guided ligation of hemorrhoidal vessels is being proposed as a treatment of grade 2 and 3 hemorrhoids. Many researchers are coupling this procedure with mucopexy or lifting of hemorrhoids to control the prolapse more effectively. The present study was conducted in patients with 3rd-degree hemorrhoids to determine the usefulness of Doppler-guided hemorrhoidal artery ligation compared to mucopexy of prolapsing hemorrhoids and to compare it with mere mucopexy of the hemorrhoids. Materials and methods: A double-blind, randomized controlled study was conducted on 48 consecutive patients with grade III hemorrhoids requiring surgery. The patients were randomized into two groups. Half of them were treated with ligation and mucopexy [SL], while the remaining patients underwent a Doppler-guided hemorrhoidal artery ligation followed by ligation and mucopexy [DSL]. The patients were examined by a blinded independent observer at 2, 4, and 6 weeks and at the end of 1 year after the operation to evaluate postoperative pain scores, amount of analgesics consumed, and complications encountered. The observer also assessed recurrence of hemorrhoids after 1 year. Results: Operative time was significantly longer in the DSL group (31 min vs. 9 min P < 0.003). The postoperative pain score was significantly higher in the Doppler group [4.4 vs. 2.2, P < 0.002 (visual analogue scale)]. The mean total analgesic dose and duration of pain control using analgesics were greater and longer for the Doppler group than for the SL group (17 vs. 11 tablets, and 13 days vs. 9 days, respectively; P < 0. 01). Complications were similar in both the groups. At 1-year follow-up, the recurrence of hemorrhoids was not statistically significant in either group (4 patients in SL group and 3 patients in DSL group; P < 0.93). Conclusions: Suture ligation of hemorrhoids is a simple, cost-effective, and convenient modality for treating grade 3 hemorrhoids. Doppler assistance in ligating the hemorrhoidal vessels prior to hemorrhoidal mucopexy offers no advantage and is a time-consuming procedure. 2011 Springer-Verlag.

Source: EMBASE

Available in fulltext at Techniques in Coloproctology; Collection notes: On first login to a ProQuest journal you will need to select ‘Athens (OpenAthens Federation)’ from Select...
22. Outcomes of Doppler-guided hemorrhoid artery ligation: analysis of 90 consecutive patients

Author(s): Spyridakis M., Christodoulidis G., Symeonidis D., Dimas D., Diamantis A., Polychronopoulou E., Tepetes K.

Citation: Techniques in coloproctology, October 2011, vol./is. 15 Suppl 1/(S21-24), 1128-045X (Oct 2011)

Publication Date: October 2011

Abstract: Doppler-guided hemorrhoid artery ligation is a minimal-invasive surgical treatment option for hemorrhoidal disease. The aim of our study was to evaluate the early and long-term results of the procedure 1 year after the operation. In a period of 4 years, 90 patients were included in this study. The Doppler-guided hemorrhoid artery ligation was performed under either spinal anesthesia or local perianal block. We recorded the length of postoperative inpatient care, on-demand analgesics administered apart from the standard analgesic protocol, short- and long-term complications, and, finally, recurrences. The mean age of patients was 46 ± 12.6 years. The operation was performed under spinal anesthesia in 82 patients and under local perianal block in 8 patients. The mean operative time was 26 ± 4.1 min. On-demand analgesics administration was reported in sixteen patients (17.7%) the first postoperative day and in four patients (4.4%) the second postoperative day. A total of 58 patients (64.4%) were discharged from the hospital the day of the operation, 29 (32.2%) patients stayed overnight, and in three (3.3%) patients, a hospitalization period of 2 days was needed. Four patients (4.4%), two with grade III and two with grade IV hemorrhoids, developed early postoperative complications. Late complications were observed in three patients (3.3%). Recurrences, manifested either as bleeding or as prolapsing piles, were observed in six patients (6.6%), two patients with initial grade III and four with grade IV hemorrhoids. Doppler-guided hemorrhoid artery ligation seems to be a safe and effective treatment option for all grades of hemorrhoidal disease. Further prospective randomized comparative studies are needed in order to fully evaluate the true role of DG-HAL in the surgical armamentarium.

Source: EMBASE

Available in fulltext at Techniques in Coloproctology; Collection notes: On first login to a ProQuest journal you will need to select ‘Athens (OpenAthens Federation)’ from Select Region, and then ‘NHS England’ from Choose your Library.
hemorrhoidal symptoms and further treatments were obtained by a standardized questionnaire that was conducted during the last visit 18 months postoperatively. Results: A total of 63 patients underwent SH (aged 52 + 3.2 years) and 51 patients underwent DGHAL (aged 50 + 7.3 years). DGHAL patients experienced less postoperative pain as scored by pain during bowel movement (2.1 + 1.4 vs. 5.5 + 1.9 for SH), and required fewer analgesics postoperatively. Hospital stay, time to first bowel movement, and complete functional recovery were also significantly shorter for the DGHAL patients. Nine DGHAL patients (18%) suffered from persistent bleeding or prolapses and required additional treatment compared with 2 (3%) patients in the SH group. SH patients reported greater satisfaction compared with DGHAL patients at 1 year postoperatively. Conclusion: Both SH and DGHAL are safe procedures and have similar effectiveness for treating grade III hemorrhoids. DGHAL is less painful and provides earlier functional recovery, but is associated with higher recurrence rates and lower satisfaction rates compared with SH.

2011 Springer-Verlag.

Source: EMBASE

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24. Doppler-guided transanal haemorrhoid dearterialisation: Short and medium term follow-up of 30 cases


Citation: Colorectal Disease, September 2011, vol./is. 13/(47), 1462-8910 (September 2011)

Publication Date: September 2011

Abstract: Aim: Less painful treatments than Haemorrhoidectomy have been developed, such as Doppler-guided transanal haemorrhoid dearterialisation (THD). It consists of ligation of the distal branches of the upper rectal artery. Method: THD was performed in 30 consecutive patients with second or third-degree haemorrhoids, (19 male-11 female). Procedure was carried out under loco-regional anaesthesia. Variables were assessed prospectively. Patients were followed up at 1-3 and 6 months, and interviewed by telephone 1 year after surgery. Results: Age average: 49.4 years (30-70). Surgery time average: 23.3 min (15-50). Postoperative pain score average (analgoc scale) was 5.5 during the first day (90% had analgesia requirements), 6.6% required after second day (score: 3). Only 1 patient persistent pain after 3 month. Bleeding: three cases (one re-operated). One patient developed haemorrhoidal thrombosis after 10 days. No other complications. No readmissions. Postoperative stay: 1.4 days (0-2). Return to full normal activities: 7-8 days. A total of 85.6% had tenesmus, self-limited after 3 months. After 1 year, two patients were re-operated, three patients developed mild prolapse, and one patient has occasional bleeding. Total successful rate is 80% after 1 year. Conclusion: THD seems to be effective after 1 year, with low rate of complications.

Source: EMBASE

Available in fulltext from Colorectal Disease at EBSCOhost

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25. Hemorrhoidal artery ligation procedure with or without Doppler transducer in grade II and III hemorrhoidal disease. A blinded randomized clinical trial

Author(s) Schuurman J.-P., Borel Rinkes I.H.M., Go P.M.N.Y.H.

Citation: Colorectal Disease, September 2011, vol./is. 13/(7), 1462-8910 (September 2011)
Abstract: Aim: The aim of this study was to compare the outcome of hemorrhoidal artery ligation for hemorrhoidal disease with and without use of the provided Doppler transducer.
Method: We conducted a single-blinded randomized clinical trial and assigned 82 patients with grade II and III hemorrhoidal disease to undergo either a HAL/THD procedure without use of the Doppler-transducer (non-Doppler group, 40 patients) or a conventional HAL/THD procedure (Doppler group, 42 patients). Primary endpoint was improvement of self-reported clinical parameters after both 6 weeks and 6 months. Results: After 6 weeks and 6 months in both the non-Doppler and Doppler group, significant improvement was observed with regard to blood loss, pain, prolapse and problems with defecation (P < 0.05). The improvement of symptoms between both groups did not differ significantly (P > 0.05), except for prolapse which improved more in the non-Doppler group (P = 0.047). There were more complications and unscheduled post-operative events in the Doppler group (P < 0.0005). After 6 months 31% of the patients in the non-Doppler group and 21% in the Doppler group reported completely complaint free (P = 0.313). Conclusion: Our findings confirm that hemorrhoidal artery ligation significantly reduces signs and symptoms of hemorrhoidal disease. Our data also shows that the Doppler transducer does not contribute to this beneficial effect.

Source: EMBASE
Available in fulltext from Colorectal Disease at EBSCOhost
institution.

Author(s) Szmulowicz UM, Gurland B, Garofalo T, Zutshi M

Citation: Journal of Gastrointestinal Surgery, May 2011, vol./is. 15/5(803-8), 1091-255X;1873-4626 (2011 May)

Publication Date: May 2011

Abstract: PURPOSE: This study aims to review the short-term recurrence and complications of Doppler-guided hemorrhoidal artery ligation (DG-HAL) with mucopexy. METHODS: Approval was obtained for a retrospective chart review of patients who underwent DG-HAL from January 2007 to June 2009. A treatment failure was recorded if internal hemorrhoids were noted at follow up or symptoms persisted. All recurrences were assessed for predictive factors. RESULTS: The procedures were performed by four surgeons. Ninety-six patients were included. The average age was 63.5 years (21-81 years). The mean follow up was 15 months (3-35 months). Of the patients, 93 (96.8%) reported bleeding pre-operatively. Mucopexy accompanied DG-HAL in 87 (90.6%). Postoperative complications occurred in nine (9%) patients. Residual hemorrhoids were evident in 20 (21%) patients, 13 of whom required further management for symptomatic disease, five with DG-HAL. Fifty percent (10/20) and 70% (9/13) of the recurrences necessitating further treatment transpired during the first 20 procedures of each surgeon. All 13 symptomatic recurrences demonstrated large, circumferential internal hemorrhoids. CONCLUSIONS: DG-HAL is a simple procedure with a low complication rate. Recurrences are more frequent during the learning curve. Patients with large, circumferential internal hemorrhoids should be counseled about a possible higher rate of recurrence. DG-HAL can be effectively repeated for recurrences.

Source: Medline

Available in fulltext from Journal of Gastrointestinal Surgery at EBSCOhost

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28. The outcome of stapler hemorrhoidopexy versus Doppler-guided hemorrhoidal artery ligation for grade III hemorrhoids

Author(s) Itah R., Avital S., Skornick Y., Greenberg R.

Citation: Techniques in Coloproctology, March 2011, vol./is. 15/1(120), 1123-6337 (March 2011)

Publication Date: March 2011

Abstract: Background: The aim of our study was to prospectively evaluate the long-term results, early and late complication rates, and overall satisfaction of patients with grade III hemorrhoids treated by stapled hemorrhoidopexy (SH) or Doppler-guided hemorrhoidal artery ligation (DGHAL). Methods: Two groups of patients treated by a single surgeon over a 2-year period (by SH and by DGHAL) were compared. Clinical data on postoperative pain, analgesic requirements, time to first bowel movement and functional recovery were collected at 5 postoperative follow-up visits (1 and 6 weeks, and 6, 12 and 18 months). Data on patient satisfaction, recurrence of hemorrhoidal symptoms and further treatments were obtained by a standardized questionnaire that patients filled out during their last visit 18 months postoperatively. Results: Sixty-three patients underwent SH (average age 52 + 3.2 years) and 51 patients underwent DGHAL (average age 50 + 7.3 years). Patients who underwent DGHAL experienced less postoperative pain as scored by pain during bowel movement (2.1 + 1.4 vs. 5.5 + 1.9 for SH), and required fewer analgesics postoperatively than SH patients. Hospital stay, time to first bowel movement, and complete functional recovery were also significantly shorter for DGHAL patients. Nine DGHAL patients (18%) suffered from persistent bleeding or prolapses and required additional treatment compared to 2 (3%) patients in the SH group. Patients who underwent SH reported greater satisfaction compared to DGHAL patients at 1 year postoperatively. Conclusions: Both SH and DGHAL are safe procedures and have similar effectiveness for treating grade III hemorrhoids. Doppler-guided hemorrhoidal artery ligation is less painful and provides earlier functional recovery, but is associated with higher recurrence rates and lower
satisfaction rates than SH.

**Source:** EMBASE

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**29. Doppler-guided hemorrhoidal artery ligation and rectoanal repair (HAL-RAR) for the treatment of grade IV hemorrhoids: Long-term results in 100 consecutive patients**

**Author(s)** Faucheron J.-L., Poncet G., Voirin D., Badic B., Gangner Y.

**Citation:** Diseases of the Colon and Rectum, February 2011, vol./is. 54/2(226-231), 0012-3706;1530-0358 (February 2011)

**Publication Date:** February 2011

**Abstract:** BACKGROUND: Doppler-guided hemorrhoidal artery ligation is a minimally invasive technique for the treatment of symptomatic hemorrhoids that has been applied successfully for grade II and III hemorrhoids but is less effective for grade IV hemorrhoids. Development of a special proctoscope enabled the combination of hemorrhoidal artery ligation with transanal rectoanal repair (mucopexy), which serves to lift and then secure the protruding hemorrhoids in place. OBJECTIVE: The purpose of this study was to describe our experience with this combined procedure in the treatment of grade IV hemorrhoids. DESIGN: Prospective observational study. SETTING: Outpatient colorectal surgery unit. PATIENTS: Consecutive patients with grade IV hemorrhoids treated from April 2006 to December 2008. INTERVENTION: Hemorrhoidal artery ligation-rectoanal repair. MAIN OUTCOME MEASURES: Operating time, number of ligations, number of mucopexies and associated procedures, and postoperative symptoms were recorded. Pain was graded on a visual analog scale. Follow-up was at 2, 6, and 12 months after surgery, and then annually. RESULTS: A total of 100 consecutive patients (64 women, 36 men) with grade IV hemorrhoids were included. Preoperative symptoms were bleeding in 80 and pain in 71 patients; 19 patients had undergone previous surgical treatment for the disease. The mean operative time was 35 (range, 17-60) minutes, with a mean of 9 (range, 4-14) ligations placed per patient. Eighty-four patients were discharged on the day of the operation. Nine patients developed early postoperative complications: pain in 6, bleeding in 4, dyschezia in 1, and thrombosis of residual hemorrhoids in 3. Late complications occurred in 4 patients and were managed conservatively. Recurrence was observed in 9 patients (9%), with a mean follow-up of 34 (range, 14-42) months. LIMITATIONS: The 2 main weaknesses of the study were the lack of very long-term follow-up and the absence of a comparison with hemorrhoidectomy or hemorrhoidopexy. CONCLUSION: Doppler-guided hemorrhoidal artery ligation with rectoanal repair is safe, easy to perform, and should be considered as an effective option for the treatment of grade IV hemorrhoids. The ASCRS 2011.

**Source:** EMBASE

Available in *print* at *Grantham Hospital Staff Library*

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**30. Doppler-guided hemorrhoidal artery ligation and rectoanal repair (HAL-RAR) for the treatment of grade IV hemorrhoids: long-term results in 100 consecutive patients.**

**Author(s)** Faucheron JL, Poncet G, Voirin D, Badic B, Gangner Y

**Citation:** Diseases of the Colon & Rectum, February 2011, vol./is. 54/2(226-31), 0012-3706;1530-0358 (2011 Feb)

**Publication Date:** February 2011

**Abstract:** BACKGROUND: Doppler-guided hemorrhoidal artery ligation is a minimally invasive technique for the treatment of symptomatic hemorrhoids that has been applied successfully for grade II and III hemorrhoids but is less effective for grade IV hemorrhoids.
Development of a special proctoscope enabled the combination of hemorrhoidal artery ligation with transanal rectoanal repair (mucopexy), which serves to lift and then secure the protruding hemorrhoids in place. OBJECTIVE: The purpose of this study was to describe our experience with this combined procedure in the treatment of grade IV hemorrhoids. DESIGN: Prospective observational study. SETTING: Outpatient colorectal surgery unit. PATIENTS: Consecutive patients with grade IV hemorrhoids treated from April 2006 to December 2008. INTERVENTION: Hemorrhoidal artery ligation - rectoanal repair. MAIN OUTCOME MEASURES: Operating time, number of ligations, number of mucopexies and associated procedures, and postoperative symptoms were recorded. Pain was graded on a visual analog scale. Follow-up was at 2, 6, and 12 months after surgery, and then annually. RESULTS: A total of 100 consecutive patients (64 women, 36 men) with grade IV hemorrhoids were included. Preoperative symptoms were bleeding in 80 and pain in 71 patients; 19 patients had undergone previous surgical treatment for the disease. The mean operative time was 35 (range, 17-60) minutes, with a mean of 9 (range, 4-14) ligations placed per patient. Eighty-four patients were discharged on the day of the operation. Nine patients developed early postoperative complications: pain in 6, bleeding in 4, dyschezia in 1, and thrombosis of residual hemorrhoids in 3. Late complications occurred in 4 patients and were managed conservatively. Recurrence was observed in 9 patients (9%), with a mean follow-up of 34 (range, 14-42) months. LIMITATIONS: The 2 main weaknesses of the study were the lack of very long-term follow-up and the absence of a comparison with hemorrhoidectomy or hemorrhoidopexy. CONCLUSION: Doppler-guided hemorrhoidal artery ligation with rectoanal repair is safe, easy to perform, and should be considered as an effective option for the treatment of grade IV hemorrhoids.

**Source:** Medline

Available in print at Grantham Hospital Staff Library

31. A prospective controlled comparative study of Doppler-guided hemorrhoidal artery ligation versus operative procedures for prolapse and hemorrhoids

**Author(s)** Qin P.-P., Huang B., Cai H.-J., Ge Q., Wang Z.-L.

**Citation:** National Medical Journal of China, November 2010, vol./is. 90/44(3131-3134), 0376-2491 (30 Nov 2010)

**Publication Date:** November 2010

**Abstract:** Objective: To compare the safety and efficacy of Doppler-guided hemorrhoidal artery ligation and operative procedures for prolapse and hemorrhoids. Methods: Ninety-two cases with a diagnosis of hemorrhoids from June 1, 2006 to June 1, 2008 at our hospital were collected and divided into the observation group (A, n=40) and the control group (B, n=52). They received Doppler-guided hemorrhoidal artery ligation and operative procedures for prolapse and hemorrhoids respectively. The efficacy of two groups was compared with regards to efficacy, operative duration, postoperative pain score, postoperative analgesic use, postoperative complications, hospitalization duration, recovery time, total treatment expenditure, patient satisfaction and 1-year follow-up. Results: After treatment, two groups demonstrated similar profiles of efficacy, operative duration, patient satisfaction and the relapsing rate at 1 year. Group A was obviously better than Group B. with regards to recovery time, hospitalization duration and total treatment expenditure. Furthermore the incidence of such complications as postoperative pain, urinary retention, anal bulge, hemorrhage, perianal infections, anal edema and anal fissure was lower. Conclusion: Doppler-guided hemorrhoidal artery ligation has many advantages, such as safety, effectiveness, less trauma, a quick recovery, less treatment expenditure and a lower incidence of complications. Thus it is worthy of a wider popularization. However, its long-term effect remains to be seen.

**Source:** EMBASE

32. Doppler-guided haemorrhoidal artery ligation with recto anal repair: A new technique for the treatment of symptomatic haemorrhoids

**Author(s)** Forrest N.P., Mullerat J., Evans C., Middleton S.B.

**Citation:** International Journal of Colorectal Disease, October 2010, vol./is. 25/10(1251-
Abstract: Purpose: Doppler-guided haemorrhoidal artery ligation (DGHAL) is a minimally invasive surgical technique used to treat symptomatic haemorrhoids. In 2005, the DGHAL proctoscope was redesigned to incorporate a window through which a recto anal repair (RAR) could be performed to improve the outcome in patients with significant prolapse symptoms. The aim of this study was to observe the outcome of a series of consecutive DGHAL-RAR procedures. Method: Seventy-seven consecutive patients (49 male) underwent DGHAL-RAR for symptomatic haemorrhoids and were reviewed for a minimum of 6 months post-surgery. Results: Fifty-seven (74%) of patients presented with both prolapse and bleeding symptoms. The median number of DGHALs performed was six, and the median number of RARs was two. Most (96%) patients were discharged the same day. At follow-up, 11 patients complained of recurrent symptoms, five of prolapse, four of bleeding and two of pruritus. Eight patients suffered with post-operative anal fissures. The procedure is recommended by 84.4% of patients 6 weeks post-surgery. Conclusion: DGHAL-RAR is safe, effective and well tolerated. It reduces the need for potentially dangerous excisional procedures. The RAR component is an effective addition to DGHAL in the short term for the treatment of prolapse, but longer follow-up will be required to demonstrate durability of the technique. 2010 Springer-Verlag.

Source: EMBASE

Available in fulltext at International Journal of Colorectal Disease; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

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33. Doppler guided haemorrhoidal arterial ligation with recto-anal-repair (RAR) for the treatment of advanced haemorrhoidal disease.

Author(s) Walega P, Krokowicz P, Romaniszyn M, Kenig J, Salowka J, Nowakowski M, Herman RM, Nowak W

Citation: Colorectal Disease, October 2010, vol./is. 12/10 Online(e326-9), 1462-8910;1463-1318 (2010 Oct)

Publication Date: October 2010

Abstract: OBJECTIVE: A modification of Doppler guided haemorrhoidal artery ligation (DGHAL) to include the addition of recto-anal repair is reported. Preliminary results of function and safety of third and fourth degree haemorrhoids are given.METHOD: Thirty patients underwent DGHAL combined with recto-anal-repair (RAR). Each had rectal examination, anorectal manometry and Quality of Life assessment before and 3 months after the procedure.RESULTS: Twenty-nine patients were included in the final analysis. There were three (10.34%) patients of intra-operative and one (3.45%) of postoperative bleeding. Three months after RAR (17.24%) patients with minor residual mucosal prolapse were detected, three (10.34%) patients reported residual symptoms. There was no case of recurrent bleeding. Anal manometry at 3 months after RAR was significantly lower than before the procedure (P < 0.05). One (3.45%) patient reported occasional soiling 3 months after RAR.CONCLUSION: Recto-anal-repair is safe in treating third and fourth degree haemorrhoids with no major complications and low rate of residual disease. 2010 The Authors. Colorectal Disease 2010 The Association of Coloproctology of Great Britain and Ireland.

Source: Medline

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34. Doppler guided hemorrhoidal artery ligation and recto-anal repair (DG-HAL & RAR) for treatment of internal hemorrhoids: 2 Year results
Aim: To evaluate the 2 year results of DG-HAL & RAR for grade II-IV hemorrhoid patients including complications and satisfaction. Method: Ninety-four patients who underwent the DG-HAL & RAR from October 2007 to February 2010 were analyzed retrospectively. And we have recently interviewed all patients over the telephone. Results: Of 94 patients, 62 were male and 32 were female. 10 patients had Grade II, 68 had Grade III and 16 had Grade IV internal hemorrhoids. The mean age was 50.8 ± 13 (22 ~ 87) years, the mean follow-up was 437 ± 309 days, mean operation time was 34 min and the mean hospital stay was 1.6 days. After surgery, the mean duration of the patients return to daily life was 2.3 ± 2.0 days. The mean pain score decreased from 2.4 (0 ~ 10) at 2 hours postoperatively to 0.8 (0 ~ 7) on the seventh postoperative day. Postoperative complaints were tenesmus (40%), minor bleeding (16%), and voiding difficulty (3%) but no one had a significant complication. 21 patients (22.3%) had recurrence of prolapse. The mean operation satisfaction score was 7.4 (0 ~ 10). 78% of patients recommended this operation. Conclusion: DG-HAL & RAR is a safe, minimally painful and satisfying procedure. However, comparative studies with other procedures and long-term follow-up are required to evaluate recurrence.

Source: EMBASE
Available in fulltext from Colorectal Disease at EBSCOhost

35. Doppler-guided haemorrhoidal artery ligation and rectoanal repair (HAL-RAR) for the treatment of fourth degree haemorrhoids - Long term results in 100 consecutive patients

Author(s) Faucheron J.-L., Voirin D., Gangner Y., Badic B.

Citation: Colorectal Disease, September 2010, vol./is. 12/(48), 1462-8910 (September 2010)

Abstract: Aim: Doppler-guided haemorrhoidal artery ligation is a minimally invasive technique for the treatment of symptomatic haemorrhoids, but is not effective in fourth degree haemorrhoids. A proctoscope was designed to allow combined haemorrhoidal artery ligation and transanal recto-anal repair. We report our experience with this procedure. Method: The procedure was performed on 100 consecutive patients with fourth degree haemorrhoids from 2006 to 2008. Other symptoms were bleeding in 80 cases and pain in 71 cases. Nineteen patients had previously been treated for haemorrhoids. All patients were evaluated at 2, 6, and 12 months, and then annually. Results: The mean operative time was 32 min. On average, nine ligatures per patient were placed. Eighty four patients were discharged on the day of operation. Nine patients developed early postoperative complications: pain in six, bleeding in four, dyschezia in one and thrombosis in three. Late complications occurred in four patients, and were managed conservatively. Recurrence was observed in nine patients after a mean follow-up of 34 months. Conclusion: Doppler-guided haemorrhoidal artery ligation and recto-anal repair is easy to perform and safe. The procedure should be considered as an effective alternative for the treatment of fourth degree haemorrhoids.

Source: EMBASE
Available in fulltext from Colorectal Disease at EBSCOhost

36. Haemorrhoid artery ligation with recto-anal repair (HAL-RAR): Is it any good and does it last?
Introduction: The painless doppler-guided haemorrhoid artery ligation (DGHAL) was met with some scepticism by surgeons but with enthusiasm by patients. Non-randomised studies however demonstrated it failed to control prolapse symptoms sufficiently in the longer term. The HAL-RAR procedure employs a mucopexy after the ligation procedure at the cost of a few days post-operative pain. The aim of this study was to evaluate the longer-term outcomes and patient satisfaction in a large cohort of patients undergoing HAL-RAR for symptomatic haemorrhoids. Methods: A prospective database of all HAL-RARs performed by one surgeon since its introduction was analysed. Patients were asked to list all recurrent or continuous symptoms at follow-up and express their satisfaction with the procedure. Results: 187 HAL-RAR procedures were performed up to July 2009, on 179 patients. No follow-up was available on nine patients. The remaining 171 patients had follow-up recorded for an average of 14 months (range 1-34 months). Immediate postoperative pain lasted for average 2 days. 13 (8%) developed a fissure post-operatively, the most common post-operative 'complications' were symptomatic skin tags and pruritis. 41% of patients had some symptoms at last follow-up, mostly minor (10 pruritis; 9 pain; 14 skin tags; 4 other complaints; 17 bleeding; 16 prolapse symptoms). 84% of patients were pleased with the procedure and would recommend it. For those with symptoms, most with symptomatic skin tags said they wished we had excised them at the time of the procedure. Pain was prevalent in the group of patients who developed a fissure post-operatively, and these patients were largely dissatisfied with the procedure. Further interventions were a repeat HAL-RAR in 8, PPH in 5, excision anal skin tags in 7, single pedicle haemorrhoidectomy in three. Six patients who came back with recurrent symptoms have been referred for pelvic floor investigations with ODS type symptoms. Conclusions: HAL-RAR is a safe and effective procedure but case selection is important. A randomised controlled study should be performed comparing HAL-RAR with PPH in 2nd and 3rd degree haemorrhoids.

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37. Day case haemorrhoidectomy - Is ligasure the answer to the NHS budget constraints?

Introduction: HES data records 30 000 haemorrhoid operations every year in England. Recently the NHS Tariff for a day case haemorrhoidectomy was reduced to about £800. Ligasure can be used to undertake an excisional haemorrhoidectomy and is a simple and easy to learn technique with low complication rates. Other popular techniques for day case haemorrhoidectomy include HALO and stapled haemorrhoidectomy. We present an audit of our Ligasure haemorrhoidectomies. Methods: Data from a prospectively maintained database of Ligasure haemorrhoidectomies between January 2004 and January 2009 was analysed. Data was collated from questionnaires sent to patients at months 6 and 12 post procedure. Minor post operative complications such as bleeding, urgency and incontinence and overall patient satisfaction were studied. Costs of the procedure were obtained from industry and NHS tariffs 2009. Results: Seventy-seven patients were evaluated, including 32 women (Aged 23-87, mean age 55) and 45 men (Aged 30-89, mean age 59). We received 63 responses at six months and 52 responses at 12 months. At six months the complication rates were as follows: pain 20%, bleeding 17%, and urgency 21%. At twelve months the complication rates were pain 19%, bleeding 19% and urgency 15%. Overall patient satisfaction was 98% at six months and 94% at twelve months. Consumable costs per unit for Ligasure are approximately £140.00 which compares favourably with £350.00 for HALO and £450.00 for Stapled haemorrhoidectomy. Conclusion: Ligasure haemorrhoidectomy is a safe and acceptable treatment for prolapsing haemorrhoids. It is
easy to learn and can be utilised in a day case setting. Ligasure haemorrhoidectomy also achieves high levels of patient satisfaction. In a tariff driven National Health Service the Ligasure bipolar device offers a cheaper alternative to other day case techniques. In light of the Particulary suited to the day case setting.

Source: EMBASE
Available in fulltext from Colorectal Disease at EBSCOhost
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38. Evaluation of transanal hemorrhoidal dearterialization as a minimally invasive therapeutic approach to hemorrhoids

Author(s) Ratto C., Donisi L., Parello A., Litta F., Doglietto G.B.

Citation: Diseases of the colon and rectum, May 2010, vol./is. 53/5(803-811), 1530-0358 (May 2010)

Publication Date: May 2010

Abstract: PURPOSE: Transanal hemorrhoidal dearterialization is an innovative technique to treat hemorrhoids using a specially designed proctoscope for Doppler-guided transanal ligation of hemorrhoidal arteries. We analyzed results of experience at a single-institution with this transanal hemorrhoidal dearterialization device. METHODS: Overall, 170 patients were submitted to transanal hemorrhoidal dearterialization during the period July 2005 through October 2008. The operation consisted of hemorrhoidal dearterialization (of 6 arteries) in all patients, with major mucosal/submucosal pexy in 56 patients (32.9%). The first consecutive 11 patients (6.4%) were treated under general/spinal anesthesia, the remaining 159 (93.6%) by sedation with propofol, supported by analgesia with remifentanil. Following transanal hemorrhoidal dearterialization surgery, patients were regularly evaluated at 2 weeks, 1 and 3 months, and once a year after operation. RESULTS: The mean age of the 170 patients was 47.3 +/- 13.0 years; 102 (60%) were men. Hemorrhoidal disease was grade II in 13 (7.6%); grade III in 141 (82.7%), and grade IV in 16 (9.6%). Postoperative bleeding requiring surgical hemostasis occurred in 2 cases (1.2%). Mean follow-up was 11.5 +/- 12 (range, 1-41) months. Hemorrhoidal thrombosis occurred in 4 patients (2.3%), chronic pain and fecal incontinence in none. Hemorrhoidal prolapse was reported at follow-up by 50 patients (29.5%), but prolapse was confirmed only in 18 (10.5%) and was mild; some patients reporting prolapse were found to have skin tags. Overall, long-term control of bleeding was obtained in 159 patients (93.5%) and control of prolapse in 152 (89.5%). Recurrence of hemorrhoidal disease requiring surgery was found in 7 patients (4.1%). CONCLUSIONS: Transanal hemorrhoidal dearterialization appears to be a very effective minimally invasive option to treat hemorrhoids and can be performed in a day-surgery setting. Future controlled trials comparing transanal hemorrhoidal dearterialization with other procedures will show the real potential of transanal hemorrhoidal dearterialization and define adequate indications for this approach.

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Available in print at Grantham Hospital Staff Library

39. Doppler-guided hemorrhoid artery ligation and rectoanal repair for grade 2 and 3 hemorrhoids: Outcomes after surgery

Author(s) Farouk R., Lieske B., Conaghan P.

Citation: Diseases of the Colon and Rectum, April 2010, vol./is. 53/4(580-581), 0012-3706 (April 2010)

Publication Date: April 2010

Abstract: Purpose: To assess early and medium term outcomes after Doppler Guided Hemorrhoid Artery Ligation and Rectoanal Repair (DGHAL-RAR) in patients with Grade 2 or 3 hemorrhoids. Methods: A retrospective review of a prospectively kept database of seventy-five patients who have undergone DGHAL-RAR with a minimum of one year follow-up. Results: Seventy-five patients (30 women; median age 45 [range, 19-69] years) with grade 2 (51 patients) or grade 3 (24 patients) hemorrhoids underwent DGHAL-RAR
between February 2007 and November 2008. Three patients (4%) developed complications within thirty days of surgery requiring readmission - fecal impaction 1 patient; severe pain 1 patient; bleeding 1 patient. All patients were reviewed 4 weeks after surgery. Subsequent follow-up was conducted by questionnaire or telephone interview 12 and 24 months after surgery. Median follow-up available by questionnaire or by telephone survey is 18 (range, 12 - 34) months. Recurrent anal bleeding has been reported by 15 (20%) patients (regularly: 3; occasional 9; rarely 3). Recurrent hemorrhoidal prolapse has been reported by 4 patients (5%), recurrent anal soreness by 12 patients (16%) and persistent pruritus ani by 9 patients (12%). Two patients have required a single quadrant hemorrhoidectomy subsequent to their DGHAL-RAR for recurrent prolapse and one is considering further surgery for recurrent bleeding. Seventy-one patients (95%) reported satisfaction with their surgery and would have been willing to undergo repeat DGHAL-RAR if their symptoms recurred. Conclusions: DGHAL-RAR for grade 2 or 3 hemorrhoids is associated with high patient satisfaction. Relief of symptoms of bleeding, prolapse, anal soreness and pruritus ani can be achieved for the majority of patients without requiring excisional surgery.

Source: EMBASE
Available in print at Grantham Hospital Staff Library


Author(s) Theodoropoulos GE, Sevrisarianos N, Papaconstantinou J, Panoussopoulos SG, Dardamanis D, Stamopoulos P, Bramis K, Spiliotis J, Datisis A, Leandros E

Citation: Colorectal Disease, February 2010, vol./is. 12/2(125-34), 1462-8910;1463-1318 (2010 Feb)

Publication Date: February 2010

Abstract: OBJECTIVE: The isolated use of Doppler-guided haemorrhoidal artery ligation (DGHAL) may fail for advanced haemorrhoids (HR; grades III and IV). Suture haemorrhoidopexy (SHP) and mucopexy by rectoanal repair (RAR) result in haemorrhoidal lifting and fixation. A prospective evaluation was performed to evaluate the results of DGHAL combined with adjunctive procedures.METHOD: The study included 147 patients with HR (male patients: 102; grade III: 95, grade IV: 52) presenting with bleeding (73%) and prolapse (62%).RESULTS: More ligations were required for grade IV than grade III HR (10.7 + 2.8 vs 8.6 + 2.2, P < 0.001). SHP (28 patients) and RAR (18 patients) at 1-4 positions were deemed necessary in 46 (31%) patients. Minimal (muco-)cutaneous excision (MMCE) was added in 23 patients. SHP/RAR was applied more frequently in grade IV HR (60%vs 16%, P < 0.001). In patients not having MMCE, SHP/RAR was added in 57% of grade IV cases (P < 0.001). Complications included residual prolapse (10; two second surgery), bleeding (15; two second DGHAL), thrombosis (four), fistula (three) and analgesia was required not at all, up to 1-3 days, 4-7 days and >7 days by 30%, 31%, 16% and 14% of the patients, respectively. SHP/RAR was associated with greater discomfort (17%vs 6%, P < 0.001). No differences were found between SHP and RAR. At an average follow-up of 15 months, 96% of patients were asymptomatic and 95% were satisfied.CONCLUSIONS: DGHAL with the selective application of SHP/RAR is a safe and effective technique for advanced grade HR.

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41. Results of 244 consecutive patients with hemorrhoids treated with Doppler-guided hemorrhoidal artery ligation

Author(s) Pol R.A., van der Zwet W.C., Hoornenborg D., Makkinga B., Kaijser M., Eeftinck Schattenkerk M., Eddes E.H.

Citation: Digestive surgery, 2010, vol./is. 27/4(279-284), 1421-9883 (2010)
Abstract: This study was designed to determine the effect of treating hemorrhoids with the Doppler-guided hemorrhoidal artery ligation (DG-HAL) procedure. From June 2005 to March 2008, 244 consecutive hemorrhoidal patients underwent hemorrhoidal artery ligation performed with the DG-HAL system from AMI. All patients were evaluated postoperatively with a proctologic examination and interview. Further follow-up was performed by telephone with a standardized questionnaire. When indicated, patients revisited the clinic for further examination and treatment. 244 patients were treated with DG-HAL. The mean follow-up time was 18.4 months (range 1.4-37.2). Sixty-seven percent of the patients had an improvement of symptoms after one treatment. Fifty-three patients (22%) underwent a second procedure because of persisting symptoms. Thirteen patients (25%) underwent a second DG-HAL and 40 (75%) underwent rubber band ligation. In total, 69% of the patients had a good response using the DG-HAL technique. Multivariate logistic regression analysis revealed prolapse to be an independent risk factor for persistent symptoms (OR = 2.38, 95% CI 1.10-5.15). Patients with grades 3 and 4 hemorrhoids had a higher risk of developing recurrent disease (OR = 4.94, 95% CI 0.67-36.42). DG-HAL seems to be an effective procedure for treating low-grade hemorrhoids. A resection procedure should be the treatment for patients with recurrent disease. Copyright 2010 S. Karger AG, Basel.

Source: EMBASE
Available in fulltext from Digestive Surgery at EBSCOhost

42. A comparison of initial outcome after doppler-guided haemorrhoidal artery ligation and rubber band ligation for 2nd/3rd degree haemorrhoids

Author(s) Arthur J., Barben C., Skaife P.
Citation: Colorectal Disease, September 2009, vol./is. 11/(16), 1462-8910 (September 2009)

Publication Date: September 2009

Abstract: Aim: Doppler-guided Haemorrhoidal Artery Ligation (DG-HAL), a safe and effective novel haemorrhoidal therapy, with rubber band ligation (RBL), an accepted and established haemorrhoidal treatment. Method: One hundred and fifty-four patients with symptomatic 2nd/3rd degree haemorrhoids were self-randomised to either procedure. Demographics, postoperative complications and maximal pain scores (VAS) within 24 h of the procedure were recorded. At initial follow-up, symptom resolution and patient satisfaction were assessed. Results: Patient demographics, haemorrhoidal stage and median maximal VAS were similar between both groups. There were no complications after either procedure. At 12 weeks median follow-up for patients with 3rd degree haemorrhoids, 19/25 (76%) after DG-HAL had partial or complete resolution of bleeding and prolapse compared with 38/55 (69%) after RBL (P = 0.72). In patients with 2nd degree haemorrhoids, 23/26 (88%) were partially/completely symptom-free after DG-HAL compared with 36/48 (75%) after RBL (P = 0.28). Ninety percent of DG-HAL patients were satisfied, and would undergo the procedure again, compared with 76% after RBL (P = 0.0018) correlating approximately with successful symptom resolution. Conclusion: There was no significant difference between DG-HAL and RBL for 2<sup>nd</sup>and 3<sup>rd</sup> degree haemorrhoids although patients were significantly more satisfied with the former.

Source: EMBASE
Available in fulltext from Colorectal Disease at EBSCOhost

43. Doppler-guided haemorrhoidal artery ligation for 2nd and 3rd degree
44. Early experience with Doppler-guided hemorrhoidal artery ligation

Author(s) Lim M., Kwang H.K., Soon S.C., Sun Y.N., Ryung A.L.

Citation: Journal of the Korean Society of Coloproctology, August 2009, vol./is. 25/4(215-219), 1229-8670 (August 2009)

Publication Date: August 2009

Abstract: Purpose: Doppler-guided hemorrhoidal artery ligation (HAL) is an alternative technique to the standard Milligan-Morgan hemorrhoidectomy. The purpose of this pilot study is to introduce the HAL technique for grade 2-3 internal hemorrhoids and to evaluate the efficacy of this technique in Korea in terms of results and patient satisfaction. Methods: The HAL procedure was performed on 29 patients with grade 2 or 3 internal hemorrhoids. Twenty-eight procedures were performed under local anesthesia with lidocaine, and one procedure was performed under general anesthesia due to synchronous surgery for gallstones. With the lithotomy position, the pulsation of the hemorrhoidal artery was localized using a doppler probe, and 3-6 branches of the hemorrhoidal artery were ligated with vicryl 2-0. Patient course was evaluated before and after the procedure by using questionnaires with a visual analog scale. Results: The mean age of the patients was 44±24 yr. There were no significant complications with this procedure. At 3 mo after the operation, symptom scores of anal pain, anal bleeding, and anal prolapse were significantly improved (0.4, 1.0, and 2.4, respectively) compared to the symptom scores before the operation (3.4, 4.6, and 5.9, respectively). The postoperative satisfaction score was 8.1, and the recommendation score was 8.5. Conclusion: HAL is a safe and effective technique to relieve anal pain, bleeding, and prolapse of internal hemorrhoids. A comparative study with other procedures and a long-term follow-up after HAL should be the basis for validating the efficacy of this procedure. 2009 The Korean Society of Coloproctology.

Source: EMBASE

Available in fulltext from Colorectal Disease at EBSCOhost

45. Conventional haemorrhoidectomy, stapled haemorrhoidectomy, Doppler guided haemorrhoidectomy artery ligation; post operative pain and anorectal manometric assessment

Author(s) Khafagy W., El Nakeeb A., Fouda E., Omar W., Elhak N.G., Farid M., Elshobaky
Abstract: BACKGROUND/AIMS: The aim of the present article was to compare stapled haemorrhoidectomy, and haemorrhoidal artery ligation with open haemorrhoidectomy with respect to the postoperative pain, symptom control, and manometric alterations.

METHODOLOG: Forty five patients with third or fourth-degree haemorrhoids were randomly classified into three groups; first group managed by stapled haemorrhoidectomy, second group managed by conventional haemorrhoidectomy and third group managed by Doppler guided haemorrhoidal artery ligation. (15 patients each) Preoperative and 12 weeks postoperative anorectal manometry were done for all patients. RESULTS: There was a significant difference of the operative time between stapled group and Milligan-Morgan group (p < 0.001) while no significant difference between stapled group and Doppler group. The pain scores were significantly higher in open group (p < 0.001) during the first 24 hours at the time of first motion and one week after operation. Postoperative control of prolapsed symptoms was significantly better with open diathermy haemorrhoidectomy than with stapled. The control of other symptoms was similar with regard to bleeding, pain, pruritis, and incontinence scores. Anorectal manometry showed a decrease in the maximum resting pressure and maximum squeeze pressure in all groups, but this decrease was only significant in the stapled haemorrhoidectomy group. CONCLUSIONS: Stapled and Doppler haemorrhoidectomy is as effective as conventional haemorrhoidectomy for the treatment of haemorrhoids, but with the exception of skin tag prolapse. There is a need for long-term follow-up for the changes in manometric parameters after haemorrhoidectomy.

Source: EMBASE

46. Application of simple digital methods in the treatment of Hemorrhoid disease

Author(s) Hajdarevic B., Slaku J., Pandza H., Salihefendic N., Hadziahmetovic Z.

Citation: Studies in Health Technology and Informatics, 2009, vol./is. 150/(433-437), 0926-9630;1879-8365 (2009)

Abstract: The treatment of patient with relapse of bleeding after application of minimally invasive treatment of hemorrhoidal disease such as elastic band ligation, cryosurgical treatment Hemorrhoidal Arterial Ligation (HAL) can be presented as serious clinical problem in patients with concomitant diseases that can be contraindication for radical surgical treatment. We compared the Simple Digital Method and standard above mentioned minimally invasive ambulatory treatment. We used special proctoscope with Doppler Flowmeter in order to identify all branches of hemorrhoidal artery in the anal canal creating graphical presentation using specially adapted software. HAL method is then used to perform ligation of hemorrhoidal artery branches. The elastic ligatures (called gummiligatures) are then applied to the piles in which most prominent flow was registered using Doppler Flowmeter. Antibiotic prophylaxis and sedation was administered preoperatively. Special computer program registered all steps. Hemorrhoidal ointments and paracetamol were used after surgical procedure. Average number of identified hemorrhoid arteries branches was six, and total duration of the procedure was in average 28 min. We compared patient treatment with our method and standard methods. In tested group we noticed significantly fewer complications (after eight days the number of complications 11% vs. 74%, p <0.001, after 15 days 3% vs. 11%: p=0.101). One year after procedure, the treatment was successful in 91.4%, or 32 out of 35 patients according to proctoscopy and Doppler Flowmeter exam. There were three patients with relapse of symptoms. In 77% of patients hat were treated with rubber bands ligation relapse occurred. Our method is significantly more successful in comparison to classical methods of ambulatory treatment and can be alternative to radical surgical treatment. 2009 European Federation for Medical Informatics.

Source: EMBASE
47. Doppler-guided haemorrhoidal artery ligation: Long-term outcome and patient satisfaction

Author(s) Wilkerson P.M., Strbac M., Reece-smith H., Middleton S.B.

Citation: Colorectal Disease, 2009, vol./is. 11/4(394-400), 1462-8910;1463-1318 (2009)

Publication Date: 2009

Abstract: Objective: Conventional Milligan-Morgan haemorrhoidectomy is associated with significant pain and potentially hazardous complications. Doppler-Guided Haemorrhoidal Artery Ligation (DGHAL) may offer a lower risk, pain-free alternative. We present our early and long-term outcome experience with DGHAL, combined with patient views and satisfaction with the procedure. Method: One hundred and thirteen DGHALs were performed over a 13 month period by two surgeons in a single centre. Patients graded the severity of postoperative pain on visual-analogue scales. Clinical follow-up was at 6 weeks (n = 103), with long-term follow-up (n = 90) by postal questionnaire at median of 30 months. Result: Seven out of one hundred and three (6%) patients reported postoperative discomfort requiring analgesia. Ninety-three out of one hundred and three (90%) patients reported complete relief or significant improvement in their symptoms at 6 weeks, dropping to 77/90 (86%) at 30 months. Anal fissures developed in 2/103 (2%) patients, both treated with Diltiazem ointment. Further surgery was required in 8/90 (9%) patients. Eighty-two out of ninety (91%) patients said they would undergo DGHAL again. Conclusion: DGHAL is a relatively painless, safe, and effective procedure for symptomatic stage I-III haemorrhoids, for which we have demonstrated long-term durability and acceptability. Its role lies between office based procedures and more invasive operative interventions. Journal compilation 2009 The Association of Coloproctology of Great Britain and Ireland.

Source: EMBASE

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Author(s) Walega P., Scheyer M., Kenig J., Herman R.M., Arnold S., Nowak M., Cegielny T.

Citation: Surgical Endoscopy and Other Interventional Techniques, November 2008, vol./is. 22/11(2379-2383), 0930-2794;1432-2218 (November 2008)

Publication Date: November 2008

Abstract: Introduction: Doppler-guided hemorrhoidal artery ligation (DGHAL), as a method of treating hemorrhoidal disease, is currently used in many centers across Europe, Asia, and Australia. The aim of our study was to evaluate the clinical effectiveness and functional results of DGHAL as estimated by means of anorectal manometry. Materials and methods: Between 2000 and 2006 the DGHAL procedure was performed on 507 patients with II-IV degree hemorrhoids in two centers (Poland and Austria). Three hundred eight patients were included in the initial phase of the study, designed to estimate the method's effectiveness. During the second phase (199 patients) selected functional results were also assessed. Patients were classified as having grade II (144), III (319), and IV (44) hemorrhoids. Results: There were no intra- and immediate postoperative complications. Good results were reported by 351 patients (69.2%), and were acceptable in a further 75 cases (4.8%). When the patients were grouped according to the stage of hemorrhoidal disease, 133 out of 144 patients (92.4%) with grade II and 272 out of 324 (84%) with grade III had very good or good results. Only 18 out of 44 patients (41%) with grade IV were satisfied with the operation. Fifty-nine patients after anorectal folds, fissure or anal canal polyp excision required analgesics for 1-2 days. Apart from lower contraction amplitude and contraction speed after 1 month there were no differences in anorectal functional tests. Conclusion: Based on our results we may conclude that DGHAL is a safe and effective...
method and may offer an important alternative to operative hemorrhoidectomy with no risk of postoperative stool incontinence, minimal postoperative pain, and early return of patients to their normal activities. Nevertheless, this is a fairly new procedure with a short-term follow-up. Until 5-year observations of large, multicenter, randomized trials are published we cannot recommend this method as a gold-standard procedure, although it still can offer significant benefits to patients. 2008 Springer Science+Business Media, LLC.

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49. Doppler-guided hemorrhoidal artery ligation for the treatment of symptomatic hemorrhoids: Early and three-year follow-up results in 100 consecutive patients

Author(s) Faucheron J.-L., Gangner Y.

Citation: Diseases of the Colon and Rectum, June 2008, vol./is. 51/6(945-949), 0012-3706;1530-0358 (June 2008)

Publication Date: June 2008

Abstract: PURPOSE: Doppler-guided ligation of the hemorrhoidal arteries was described as an alternative to hemorrhoidectomy. The authors report their experience with this procedure. METHODS: From 2002 to 2004, 100 consecutive patients underwent hemorrhoidal artery ligation procedure for symptomatic hemorrhoids and were reviewed at one month and at three years. RESULTS: There were 54 females. Seventy-eight patients had Grade III hemorrhoids. Eighteen patients had previously been treated for the disease. The mean operative time was 28 minutes. On average, 8.4 ligatures were placed. Seventy-nine patients were discharged the same day. Six patients presented with early complication: isolated pain in one, pain and bleeding in three, isolated bleeding in one, and obstructed defecation in one. Late complications occurred in six patients: anal pain in one, fissure in two, and thrombosis of residual hemorrhoids in three. Twelve patients presented with a recurrence at a mean delay of 12.6 months, which was treated by repeat hemorrhoidal artery ligation (n=1), hemorrhoidopexy (n=7), and hemorrhoidectomy (n=4). CONCLUSIONS: Hemorrhoidal artery ligation procedure is safe, easy to perform, and should be considered as an alternative for the treatment of symptomatic hemorrhoids, even with a recurrence rate of 12 percent, which can be treated by the same technique or another. 2008 The American Society of Colon and Rectal Surgeons.

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50. Doppler-guided haemorrhoidal arteries ligation: Preliminary clinical experience

Author(s) Abdeldaim Y., Mc Avinchey D., Mabadeje O., Muhammad K.M.

Citation: Irish Medical Journal, July 2007, vol./is. 100/7, 0332-3102;0332-3102 (July/August 2007)

Publication Date: July 2007

Abstract: In 1995, Morinaga reported on a new technique in the treatment of haemorrhoids. It relies on the reduction of haemorrhoidal vascular flow by suturing haemorrhoidal arteries. The artery is located by Doppler ultrasound transducer, haemorrhoidal artery ligation (HAL). This pilot study shows initial experience with HAL in patients with internal haemorrhoidal disease A prospective study was performed in 35 patients treated by (HAL). After a mean of 18 (range 12-24) months patients were
administered a standardized questionnaire by telephone. The treatment's success was observed in 11 of 12 patients (91.5%) with pain, 28 of 33 (85%) with bleeding, 14 of 15 (93%) with Pruritis, 12 of 13 (92%) with discharge, and 17 of 21 (81%) with prolapse. Open haemorrhoidectomy was mandatory in 3 patients (8.5%) due to bleeding and prolapse. HAL is simple, painless, safe, and effective method.

Source: EMBASE

51. Treatment of grade 2 and 3 hemorrhoids with Doppler-guided hemorrhoidal artery ligation

Author(s) Wallis De Vries B.M., Van Der Beek E.S.J., De Wijkerslooth L.R.H., Van Der Zwet W.C., Van Der Hoeven J.A.B., Eeftinck Schattenkerk M., Eddes E.H.

Citation: Digestive Surgery, January 2007, vol./is. 24/6(436-440), 0253-4886 (January 2008)

Publication Date: January 2007

Abstract: Aim: We evaluated the results of the Doppler-guided hemorrhoidal arterial ligation (DG-HAL) method in the management of symptomatic grade 2 and 3 hemorrhoids. Patients and Methods: Between June 2005 and March 2006, 110 consecutive patients with symptomatic grade 2 and 3 hemorrhoids according to the DG-HAL method were treated. All procedures were performed in daycare under spinal anesthesia. The primary objective was the reduction in hemorrhoidal gradation as determined by proctoscopy; the secondary was patient satisfaction. This was measured by interviewing patients over the telephone. Results: The average age was 47.6 years. 42 patients had grade 2 hemorrhoids, 68 grade 3. An average of 7.3 ligations were placed. Proctoscopy showed that, after 6 weeks, 97 (88%) patients had a significant improvement in their hemorrhoidal gradation. After an average follow-up of 37 weeks, 93 of the 110 (84.5%) patients were satisfied with the postoperative result. Mortality was 0% and morbidity 3%. Conclusion: DG-HAL is a safe and effective treatment in the management of symptomatic grade 2 and 3 hemorrhoids. Copyright 2007 S. Karger AG.

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52. Doppler-guided hemorrhoidal artery ligation: Commentary

Author(s) Dal Monte P.P.

Citation: Techniques in Coloproctology, October 2006, vol./is. 10/3(262), 1123-6337 (October 2006)

Publication Date: October 2006

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53. Doppler-guided hemorrhoidal artery ligation

Author(s) Farkas L.M.

Citation: Diseases of the Colon and Rectum, August 2006, vol./is. 49/8(1251), 0012-
54. First 100 cases with Doppler-guided hemorrhoidal artery ligation

Author(s) Greenberg R., Karin E., Avital S., Skornick Y., Werbin N.

Citation: Diseases of the Colon and Rectum, April 2006, vol./is. 49/4(485-489), 0012-3706;1530-0358 (April 2006)

Publication Date: April 2006

Abstract: PURPOSE: This study was designed to examine the benefits of a Doppler-guided hemorrhoidal artery ligation technique in terms of surgical outcome, functional recovery, and postoperative pain. METHODS: Using local, regional, or general anesthesia, 100 patients with symptomatic Grades II or III hemorrhoids underwent sonographic identification and suture ligation of six to eight terminal branches of the superior rectal artery above the dentate line. Visual Analog Scales were used for postoperative pain scoring. Surgical and functional outcomes were assessed at 6 weeks and 3, 6, and 12 months after surgery. RESULTS: There were 42 (42 percent) males and 58 (58 percent) females (mean age, 42 years; median duration of symptoms, 6.3 years). The mean operative time was 19 minutes. Local anal block combined with intravenous sedation (n = 93) or general or spinal (n = 7) anesthesia was used. Only five were hospitalized overnight. There was no urinary retention, bleeding, or mortality in the immediate postoperative course. The mean pain score decreased from 2.1 at two hours postoperative to 1.3 on the first postoperative day. All patients had a complete functional recovery by the third postoperative day. Ninety-four patients remained asymptomatic after a mean follow-up of six months: four patients required additional surgical excision, and two required rubber band ligations for persistent bleeding. On follow-up, there was no report of incontinence to gas or feces, fecal impaction, or persistent pain. CONCLUSIONS: Our experience indicates that Doppler-guided hemorrhoidal artery ligation is safe and effective and can be performed as an outpatient procedure with local or regional anesthesia and with minimal postoperative pain and early recovery. The American Society of Colon and Rectal Surgeons 2006.

Source: EMBASE

Available in fulltext at Diseases of the Colon and Rectum; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

Available in print at Grantham Hospital Staff Library

55. Doppler-guided hemorrhoidal artery ligation

Author(s) Scheyer M., Antonietti E., Rollinger G., Mall H., Arnold S.

Citation: American Journal of Surgery, January 2006, vol./is. 191/1(89-93), 0002-9610 (January 2006)

Publication Date: January 2006

Abstract: Background: In 1995, Morinaga [1] reported a new technique for the treatment of hemorrhoids, hemorrhoidal artery ligation (HAL), which uses a specially designed proctoscope coupled with a Doppler transducer for identification and ligation of hemorrhoidal arteries. Methods: Because the arteries carrying the blood inflow are ligated, internal pressure of the plexus hemorrhoidalis is decreased. Results: We report the results of the first 308 patients (189 male and 119 female; median age 50.1 years) who have been treated at our department since 2002 and followed-up for a median period of 18 months. Eighty-nine patients had grade II, 192 patients had grade III, and 27 patients had grade IV
56. Doppler-guided hemorrhoidal artery ligation: an alternative to hemorrhoidectomy.

Author(s) Felice G, Privitera A, Ellul E, Klaumann M

Citation: Diseases of the Colon & Rectum, November 2005, vol./is. 48/11(2090-3), 0012-3706:0012-3706 (2005 Nov)

Publication Date: November 2005

Abstract: PURPOSE: Postoperative pain is the main adverse effect of formal hemorrhoidectomy. A new technique based on Doppler-guided ligation of the terminal branches of the superior hemorrhoidal artery was introduced in 1995 as an alternative to hemorrhoidectomy. The authors report a preliminary experience with this procedure.METHODS: The Doppler-guided hemorrhoidal artery ligation technique uses a special proctoscope bearing a Doppler transducer that allows identification and suture ligation of the hemorrhoidal arteries. Sixty-eight consecutive patients (mean age, 48 years; range, 21-74 years) with Grade 3 hemorrhoids were treated.RESULTS: Intraoperative discomfort was measured by a visual analog scale (1-10) and resulted in a mean score of 2.3 (range, 1.3-2.8). Only 38 percent of patients required postoperative analgesia. Patients were examined at 1 week, 1 month, and 3 months and every 6 months thereafter. The mean follow-up was 11 (range, 3-18) months. Bleeding resolved in 91 percent of patients, pain in 73 percent, and prolapse in 94 percent. Complications were recorded in five patients and included persistent pain for more than two days in two patients (3 percent), swelling and thrombosis of one of the hemorrhoids in two patients (3 percent), and a secondary hemorrhage in one patient (1.5 percent).CONCLUSION: Doppler-guided ligation of the hemorrhoidal artery is a safe and effective alternative to hemorrhoidectomy and is associated with minimal discomfort and low risk of complications.

Source: Medline

Available in fulltext at Diseases of the Colon and Rectum; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

57. Doppler-guided hemorrhoidal artery ligation in the management of symptomatic hemorrhoids.

Author(s) Ramirez JM, Aguiella V, Elia M, Gracia JA, Martinez M

Citation: Revista Espanola de Enfermedades Digestivas, February 2005, vol./is. 97/2(97-103), 1130-0108:1130-0108 (2005 Feb)

Publication Date: February 2005

Abstract: OBJECTIVE: The aim of this study is to clinically test the efficacy of a new approach for patients having symptomatic grade III and IV hemorrhoids.MATERIAL AND METHOD: 32 patients (17 females) complaining of grade III or IV hemorrhoids were included in the study. A specially designed proctoscope coupled with a Doppler transducer on its tip was used to identify the hemorrhoidal arteries, which were afterwards suture ligated. Operating time as well as per- and post-operative complications were analyzed. Follow-up was planned following discharge after 1 week, 1 month, 6 months and 1 year.RESULTS: Mean operation time was 27 (range 18-43) minutes, and 5 (range 4-7) arteries were located on average. No patient had severe or moderate postoperative pain,
with anal discomfort being the main complaint. Rectal bleeding and tenesmus were the commonest post-operative complications. After one year of follow-up, 19 patients were free of symptoms and 6 of them had significant symptom relief. According to grade, the technique failed in just 3 grade III patients, but in as many as 4 grade IV hemorrhoid cases. CONCLUSIONS: Doppler-guided hemorrhoid artery ligation is an easy-to-perform technique that is well accepted by patients and has good results for grade III hemorrhoids. 

**Source:** Medline

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**58. Comparison of early and 1-year follow-up results of conventional hemorrhoidectomy and hemorrhoid artery ligation: A randomized study**

**Author(s):** Bursics A., Morvay K., Kupcsulik P., Flautner L.

**Citation:** International Journal of Colorectal Disease, March 2004, vol./is. 19/2(176-180), 0179-1958 (March 2004)

**Publication Date:** March 2004

**Abstract:** Background and aims: Doppler-guided hemorrhoid artery ligation is a new approach for treating hemorrhoids. Early and 1-year follow-up results of the procedure are presented and compared with those of closed scissors hemorrhoidectomy in a prospective randomized study. Patients and methods: Sixty consecutively recruited patients were randomized into two groups: group A (n=30) was treated with standardized closed scissors hemorrhoidectomy and group B (n=30) with Doppler-guided hemorrhoid artery ligation. The follow-up period was 11.7±4.6 months. Results: The average need for minor analgesics was 11.7±12.6 doses in group A and 2.9±7.7 in group B. Patients in group A spent 62.9±29.0 hours in hospital postoperatively and those in group B 19.8±41.8 hours. Return to normal daily activities took 24.9±24.5 days in group A and 3.0±5.5 days in group B. Neither the disappearance (26 vs. 25 patients) nor the recurrence of preoperative symptoms (5 vs. 6 patients) differed significantly between the two groups. Conclusion: Both procedures were effective in treating hemorrhoids. The 1-year results of Doppler-guided hemorrhoid artery ligation do not differ from those of closed scissors hemorrhoidectomy. Doppler-guided hemorrhoid artery ligation seems to be ideal for 1-day surgery, and it fulfills the requirements of minimally invasive surgery.

**Source:** EMBASE

Available in fulltext at International Journal of Colorectal Disease; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

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The management of haemorrhoids.

M Chand, GF Nash, N Dabbas - British Journal of Hospital ..., 2008 - search.ebscohost.com

... The operation can be performed with either an open technique (as described above) or a
closed technique in which the haemorrhoid component is excised ... BMJ ii: 556– 61 Chand M, Moore PJ, Andrews T, Nash GF, Clarke AD (2007) Comparison of Banding versus HALO in the ... Cited by 12 Related articles All 8 versions Cite Save

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