

Literature

Satzinger U, Feil W, Glaser K, Recto Anal Repair (RAR): a viable new treatment option for high-grade hemorrhoids. One year results of a prospective study, Pelvi-perineology 2009, 28: 37-42

Recto Anal Repair (RAR) is a new, minimally-invasive treatment option for high-grade hemorrhoids which combines HAL (Hemorrhoidal Artery Ligation) and lifting of the hemorrhoidal prolapse, known as a mucopexy, in one procedure. Our prospective study evaluates both the early and long-term clinical outcomes of this procedure. 83 patients (43% female, 57% male, mean age 56 years (range 20-83)) with high-grade hemorrhoids (90% grade III, 10% grade IV) were treated using the RAR technique (equipment: A.M.I. GmbH, Austria) by the same surgeon in two different hospitals. Follow-up was carried out at 1 week, and then at 1, 3, 6 and 12 months, whereby clinically relevant parameters such as hemorrhoidal symptoms and re-prolapse were recorded and the spatial distribution of treated arteries analysed.

RESULTS: The number of patients showing relief of hemorrhoidal symptoms at 12-month follow-up was high. Bleeding was resolved in 89% of the patients, itching in 95%, burning in 100% and soiling in 100%. The recurrence of prolapse at 12 months was low, with no re-prolapse being recorded in 89% of the patients. Patient satisfaction was consistently high (>90%) at all follow-up intervals and the complication rate was low. In addition, data indicated that course of the branches of the superior rectal artery (SRA) into the corpus cavernosum recti (CCR) is unpredictable and varies considerably from patient to patient. Recto Anal Repair not only has several perioperative advantages – minimally-invasive surgery, low

pain levels and no major complications – but also offers prolonged relief for all hemorrhoidal symptoms and for re-prolapse. RAR is an effective form of treatment for high-grade hemorrhoids.

Theodoropoulos GE, Sevrisianos N, Papaconstantinou J, Panoussopoulos SG, Dardamanis D, Stamopoulos P, Bramis K, Spiliotis J, Datsis A, Leandros E., Doppler-Guided Hemorrhoidal Artery Ligation (DGHAL), Rectoanal Repair (RAR), Sutured Haemorrhoidopexy (SHP) and minimal mucocutaneous exision (MMCE) for grade III-IV haemorrhoids: a multicenter prospective study of safety and efficacy, Colorectal Dis. 2008 Nov 14. [Epub ahead of print]

The isolated use of Doppler-guided haemorrhoidal artery ligation (DGAL) may fail for advanced haemorrhoids (HR) (grades III, 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. **METHODS:** The study included 147 patients with haemorrhoids (males:102; grade III:95, IV:52) presenting with bleeding (73%) and prolapse (62%).

RESULTS: More ligations were required for grade IV than III haemorrhoids (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 were applied more frequently in Grade IV HR (60% vs 16%, p<0.001).

In patients not having MMCE, SHP/RAR were added in 57% of grade IV cases ($p < 0.001$). Complications included residual prolapse (10; 2 second surgery), bleeding (15; 2 second DGHAL), thrombosis (4), fissure (3) and fistula (1). No analgesia was required by 30%, 31%, 16%, 14% of the patients on days 1-3, 4-7 and >7 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 haemorrhoids.

Zagryadskiy EA, Gorelv SI. Transanal Doppler-guided hemorrhoidal artery ligation / recto anal repair (HAL-RAR) for treatment of Grade 3-4 hemorrhoids: a new mini-invasive technology, *Pelviperrineology* 2008; 27: 151-155

Postoperative pain is the main adverse effect of formal hemorrhoidectomy. RAR (Recto Anal Repair) - a new technique based on HAL - Doppler-guided Hemorrhoidal Artery Ligation of the terminal branches of the superior hemorrhoidal artery combined with TRM (Transanal Rectal Mucopexy) - is presented as an alternative to hemorrhoidectomy.

METHODS: This non-controlled, prospective study includes 85 patients (male: 57, female: 28, mean age: 44 years) treated for Grade III-IV hemorrhoids. By means of a special new modified proctoscope, the arteries leading to the hemorrhoidal cushions were located in

the pain-free area of the rectum above the dentate line and ligated under Doppler guidance. A transanal rectal mucopexy was then performed to lift and secure the hemorrhoidal prolapse back in place.

RESULTS: Time of operation ranged from 24 to 45 minutes (325.21). Postoperative discomfort was measured with a visual analog scale (1-10) and resulted in a mean score of 33.2 0.52 mm (range: 2.1-4.8 mm) on the first day, and a mean score of 16.5 0.10 mm (range: 0-4.0 mm) over five days.

Patients were examined at intervals of 6, 8 and 12 months thereafter. The mean follow-up was 10 months (range: 6-12). Bleeding re-solved in 82 patients (96.5 percent), prolapse in 78 patients (91.8 percent). The complication rate was low.

CONCLUSIONS: RAR (Recto Anal Repair) - a combination of Doppler-guided ligation of the hemorrhoidal ar-teries (HAL) with transanal rectal mucopexy (TRM) - is a safe and effective alternative to hemorrhoidectomy, and associated with minimal discomfort and a low risk of complications.

Scheyer M, Antoniotti E, Rollinger G, Arnold S, Doppler Guided Recto-Anal Repair – A Combination of Haemorrhoidal Artery Ligation and Transanal Rectal Mucopexy for a Minimally Invasive Treatment of Haemorrhoidal Disease (All Grades), *JHD*, Dec 2008, Vol 23, Issue 4

Hemorrhoidal disease is one of the most common diseases of the anal region. Ten percent

of patients require surgical intervention. At our department, we have performed hemorrhoidal artery ligation (HAL) since 2000 and have further refined the technique of Doppler ultrasound-guided recto-anal repair (RAR), the combination of HAL and transanal rectal mucopexy (TRM). From January 2000 to July 2006, we applied HAL in 656 patients. Our results show that HAL can be performed successfully and with high patient comfort in patients with grade 2, grade 3, and grade 4 hemorrhoidal disease. Merely the recurrence rate for prolapse (13%) in grade 3 patients and a far too high rate of prolapse recurrence (almost 60%) in grade 4 patients were not satisfactory. Based on our own experience and references in the literature, we developed RAR, a combination of Doppler-guided HAL and TRM. A proctoscope, specially designed for this purpose (HTS Hemorrhoidal Treatment System), enables the standardized application of HAL and the use of continuous sutures for narrowing the prolapse. The Doppler-guided HAL leads to a reduction of the blood flow and a shrinking of existent hemorrhoidal cushions, while TRM leads to a lifting of the prolapse. On the whole, this standardized technique allows for the restoration of the normal anatomy using minimally invasive surgery with substantially reduced patient pain and discomfort. We report our first 110 cases treated with Doppler-guided RAR. The results show that with this new technique we can refer to a minimally invasive procedure for the treatment of all stages of hemorrhoidal disease that achieves high patient satisfaction and has a success rate of over 90%.

Faucheron JL, Gangner Y. Doppler-Guided Hemorrhoidal Artery Ligation for the Treatment of Symptomatic Hemorrhoids: Early and Three-Year Follow-up Results in 100 Consecutive Patients. Dis Colon Rectum. 2008 Jan 25

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.

P. M. Wilkerson, M. Strbac, H. Reece-Smith S. B. Middleton. Doppler-guided haemorrhoidal artery ligation: long-term outcome and patient satisfaction, 2008, 394-400

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.

RESULTS: 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

Walega P, Scheyer M, Kenig J, Herman RM, Arnold S, Nowak M, Cegielnny T, Two-center experience in the treatment of hemorrhoidal disease using Doppler-guided hemorrhoidal artery ligation: functional results after 1-year follow-up, Surg Endosc 2008 22:2379-2383

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 methods 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.

Schuurman JP, Go PMNYH, Bleys RLAW, Anatomical branches of the superior rectal artery in the distal rectum, Colorectal Dis. 2008 (Accepted Article)

OBJECTIVE:The aim of this experimental study was to study the arterial supply of the corpus cavernosum recti in the inner wall of the distal rectum in relation to hemorrhoidal

ligation therapy.

METHODS:In ten non fixed human cadavers the arterial vasculature of the rectum was studied using the Araldite casting method. Subsequently, the specimens were treated with methylbenzoate in order to obtain semitransparent specimens in which the corpus cavernosum recti could be studied.

RESULTS:Specimens were obtained permitting study of the arterial vasculature of the rectum and corpus cavernosum recti at all levels. The superior rectal artery was found to supply the corpus cavernosum recti which consisted of a variable number of equally spaced twisting arteries.

CONCLUSION:The distal rectum is supplied by the superior rectal artery. The supplying arteries of the corpus cavernosum recti are not confined to the strict locations described in the literature. This finding is of importance in surgical treatment of hemorrhoidal disease.

Pescatori M, Gagliardi G., Postoperative complications after procedure for prolapsed hemorrhoids (PPH) and stapled transanal rectal resection (STARR) procedures. Tech Coloproctol. 2008 Mar;12(1):7-19

Procedure for prolapsing hemorrhoids (PPH) and stapled transanal rectal resection for obstructed defecation (STARR) carry low postoperative pain, but may be followed by unusual and severe postoperative complications. This review deals with the pathogenesis, preven-

tion and treatment of adverse events that may occasionally be life threatening. PPH and STARR carry the expected morbidity following anorectal surgery, such as bleeding, strictures and fecal incontinence. Complications that are particular to these stapled procedures are rectovaginal fistula, chronic proctalgia, total rectal obliteration, rectal wall hematoma and perforation with pelvic sepsis often requiring a diverting stoma. A higher complication rate and worse results are expected after PPH for fourth-degree piles. Enterocele and anismus are contraindications to PPH and STARR and both operations should be used with caution in patients with weak sphincters. In conclusion, complications after PPH and STARR are not infrequent and may be difficult to manage. However, if performed in selected cases by skilled specialists aware of the risks and associated diseases, some complications may be prevented.

Cirocco WC. Life threatening sepsis and mortality following stapled hemorrhoidopexy. Surgery. 2008;143:824.

BACKGROUND Stapled hemorrhoidopexy (SH) was conceived and developed in Europe. Over the past decade, there have been reports of severe, life-threatening complications and 2 deaths. These are the first such cases from the Americas including the third known mortality.

METHODS Two case reports from US surgeons are combined with eleven reports from the medical literature (both English and non-English speaking journals) for review. Only com-

plications which required emergency abdominal operative intervention with fecal diversion were included.

RESULTS These 2 cases occurred early in the surgeons' experience with SH (under 10 cases). Incomplete rings (doughnuts) of excised rectal tissue were noted in both patients. There have been a total of 13 patients reported from seven countries across three continents requiring emergency abdominal exploration and fecal diversion for complications related directly to SH. The complications noted in these 13 patients include: 9 cases of perforation, 6 cases of sepsis, 2 cases each of obstruction and Fournier's gangrene, and 1 case each of rectovaginal fistula and intra-abdominal hemorrhage. Seventy per cent of patients underwent abdominal exploration within 3 days of SH, 90% within 5 days. The age range was 24 to 77 years. Two of the 3 oldest patients did not survive the complication (68 and 77 years of age). Three patients succumbed to sepsis in the immediate postoperative period: one on postoperative day 4 after SH (Germany), one on postoperative day 6 after SH (Spain) and the third on postoperative day 10 after SH (US). The 2 mortalities from Europe occurred immediately after colostomy 4 days after SH (Germany) and immediately after re-exploration 6 days after SH and 5 days after initial colostomy (Spain). There have been a few reports of successful, non-operative management in select patients. Symptoms of abdominal pain, urinary retention, and fever after SH frequently herald these severe life-threatening complications.

CONCLUSIONS SH has resulted in potential serious morbidity and even mortality in the immediate postoperative period. As the procedure has spread in popularity around the world, so too, it appears, have these severe, life-threatening complications. These complications

are often heralded by abdominal pain, urinary retention, and fever. Surgeons should be aware of all of the potential complications (and associated warning signs and symptoms) of SH.

Wallis de Vries BM, van der Beek ES, de Wijkerslooth LR, van der Zwet WC, van der Hoeven JA, Eeftinck Schattenkerk M, Eddes EH. Treatment of grade 2 and 3 hemorrhoids with Doppler-guided hemorrhoidal artery ligation. Dig Surg. 2007;24:436-40.

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.

Pescatori M, Aigner F. Stapled transanal rectal mucosectomy ten years after. Tech Coloproctol. 2007;11:1-6.

Stapled mucosectomy (SM) was first proposed for the management of patients with rectal internal mucosal prolapse and obstructed defecation, but gained popularity worldwide for the treatment of hemorrhoids. The present review highlights the advantages and disadvantages of the operation. SM tends to decrease postoperative pain and shortens convalescence after hemorrhoid surgery, but may be followed by severe complications, e.g. rectal obliteration and pelvic sepsis requiring a diverting stoma, more frequently than after standard hemorrhoidectomy. Moreover it carries a higher recurrence rate in the treatment of fourth-degree piles. A recent Cochrane metaanalysis demonstrated that SM is less effective than standard hemorrhoidectomy since it carries a higher recurrence rate (OR=3.6) and reintervention rate (OR=2.3). When used for rectal mucosal prolapse and obstructed defecation, SM is reported to have variable results. A better outcome is likely to be achieved in patients without anismus and psychoneurosis operated on by specialists trained with this technique

Dorn HU, Mory M. 5 Years of HAL: Experience and Long-Term Results. A Prospective Study (5 Jahre HAL: Erfahrungen und Langzeitergebnisse. Eine prospektive Studie) Coloproctology 2007;29:205–10

Background and Purpose: In recent years, hemorrhoidal artery ligation (HAL) has been part of the therapeutic spectrum of hemorrhoids. Its importance is discussed controversially. The objective of this long-term study was to evaluate compiled results and compare them to other therapeutic options.

Patients and Methods: 556 HALs on hemorrhoids of stages III were performed from September 1, 2001 to January 31, 2007. The results of 200 patients monitored prospectively for 5 years are reported. Data collection took place as follows: by a follow-up examination after 6 months as well as questionnaires and, partly, examinations after 2 and 5 years.

Results: Results obviously depend on time and stage of the disease. The primary success rate was 80.5% after 6 months (stage I: 92.8%; stage II: 81.6%; stage III: 52.5%), 79% after 2 years (stage I: 90%; stage II: 81.6%; stage III: 52.5%), and 73.5% after 5 years (stage I: 84.5%; stage II: 80.3%; stage III: 40%). In 26.5% complaints remained unchanged or required an operative procedure (stage I: 15.5%; stage II: 19.7%; stage III: 60%).

Conclusion: HAL is superior to sclerotherapy in stage I and more effective than rubber band ligation in stage II regarding the success rate as well as the relapse rate. HAL is only the therapy of second choice in stage III. Relative contraindications to HAL are a bold funnel-shaped anus, an overlong anal channel, and a broad-based hemorrhoidal area.

Scheyer M, Antonietti E, Rollinger G, Mall H, Arnold S. Doppler-guided hemorrhoidal artery ligation. Am J Surg 2006;191:89–93.

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 hemorrhoids. The acute symptoms of hemorrhoids were treated immediately by performing HAL.

Conclusions: Our study showed that HAL is painless, effective, and has a low rate of complications. It can be applied in an outpatient setting and is a good alternative to all other hemorrhoid treatment methods.

Greenberg R, Karin E, Avital S, Skornick Y, Werbin N. First 100 cases with Doppler-guided hemorrhoidal artery ligation. Dis Colon Rectum 2006;49:485–489.

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.

Aigner F, Bodner G, Gruber H, Conrad F, Fritsch H, Margreiter R, Bonatti H. The vascular nature of hemorrhoids. J Gastrointest Surg 2006;10:1044-50.

The arterial blood supply of the internal hemorrhoidal plexus is commonly believed to be associated with the pathogenesis of hemorrhoids. Ultrasound-supported proctoscopic techniques with Doppler-guided ligation of submucosal rectal arteries have been introduced for the therapy of hemorrhoids. The present investigation focuses on caliber and flow changes of the terminal branches of the superior rectal artery (SRA) supplying the corpus cavernosum recti (CCR) in patients with hemorrhoids. Forty-one outpatients (17 female, 24 male; mean age 48 years) with hemorrhoids of Goligher grades I-IV were compared with 17 healthy volunteers (nine female, eight male; mean age 29 years) by means of transperineal color Doppler ultrasound. The mean caliber of the arterial branches in the study group with hemorrhoids was 1.870.68 mm (range, 0.6 to 3.60 mm) and 0.920.15 mm (range, 0.6 to 1.2 mm) in the control group (P<0.001). The arterial blood flow was significantly higher in patients with hemorrhoids than in the control group (mean 33.9 vs. 11.9 cm/second, P<0.01). Our findings demonstrate that increased caliber and arterial blood flow of the terminal branches of the SRA are correlated with the appearance of hemorrhoids. We suggest that

the hypervascularization of the anorectum contributes to the growth of hemorrhoids rather than being a consequence of hemorrhoids. Transperineal color Doppler ultrasound (CDUS) is an appropriate method to assess these findings in patients with hemorrhoids.

Bursics A, Morvay K, Kupcsulik P, Flautner L. Comparison of early and 1-year follow-up results of conventional hemorrhoidectomy and hemorrhoid artery ligation: a randomized study. Int J Colorectal Dis 2004;19:176–80.

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 Dopplerguided 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.

CONCLUSIONS: 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.

Aigner F, Bodner G, Conrad F, Mbaka G, Kreczy A, Fritsch H. The superior rectal artery and its branching pattern with regard to its clinical influence on ligation techniques for internal hemorrhoids. Am J Surg 2004;187:102–8

BACKGROUND: The hemorrhoidal artery ligation has been used for submucosal ligation of hemorrhoidal arteries by means of an ultrasonographic transducer since 1995. The success of this technique depends on the submucosal course of these arteries. Our investigation deals with branches of the superior rectal artery which pierce the rectal wall where they cannot be reached by this method. **METHODS:** The branching patterns were investigated by means of 5 macroscopic preparations of adult pelves, histological section series of 35 fetal and 3 adult pelves impregnated in epoxy-resin, and transperineal color Doppler ultrasound of 7 proctologic patients and 28 volunteers.

RESULTS: Additional branches of the superior rectal artery coursing in outer layers of the rectal wall were shown entering the rectal wall just above the levator ani muscle to supply the internal hemorrhoidal plexus (corpus cavernosum recti).

CONCLUSIONS: The terminal course of the branches of the superior rectal artery is not only applied to the rectal submucosa. We have shown that additional branches may be detected by ultrasonography and should be taken into account by the operating surgeon.

Arnold S, Antonietti E, Rollinger G, Scheyer M. Doppler ultrasound assisted hemorrhoid artery ligation. A new therapy in symptomatic hemorrhoids. Chirurg 2002;73:269–73. [Original article in German]

In 1995, Morinaga et al. (Japan) reported on a new technique in the treatment of hemorrhoids. We report the results of our first 105 patients thus treated. By a specially designed proctoscope coupled with a Doppler transducer, the hemorrhoidal arteries are looked for and ligated. All stages of hemorrhoid were treated. This method is painless, successful, and has a low rate of complications. It is for outpatients and is an alternative to all other methods in the treatment of hemorrhoids.

Im Jahr 1995 beschrieben Morinaga et al. eine neue Technik in der Behandlung innerer Hämorrhoiden. Wir berichten von unseren Resultaten mit dieser neuen Methode, die wir bei 105 Patienten durchführten. Mittels eines modifizierten Proktoskops, in dem eine Doppler-sonde integriert ist, werden die Hämorrhoidalarterien aufgesucht und gezielt unterbunden. Es wurden alle Hämorrhoidenstadien behandelt. Diese Methode erwies sich als schmerzarm, erfolgreich und komplikationsarm. Sie kann ambulant durchgeführt werden und stellt

eine Alternative zu allen anderen Methoden dar.

Morinaga K, Hasuda K, Ikeda T, A Novel Therapy for Internal Hemorrhoids: Ligation of the Hemorrhoidal Artery Wirth a Newly Devised Instrument (Moricorn) in Conjunction Wirth a Doppler Flowmeter, Am. Journal of Gastroenterology, April 1995, Volume 90, No. 4: 610-613

Objectives: To assess the usefulness of hemorrhoidal artery ligation (HAL) for internal hemorrhoids with a newly devised instrument (the Moricorn).

Methods: We devised a new instrument (the Moricorn) that is used in conjunction with a Doppler flowmeter. The instrument allows for easy and safe ligation of the hemorrhoidal artery. HAL with the Moricorn was performed in 116 patients with internal hemorrhoids who had episodes of anal pain, bleeding and prolapse. One month after treatment, the effect was evaluated on the basis of improvement of symptoms and the shrinkage of hemorrhoidal tissue.

Results: The treatments effect was observed in 50 of 52 patients (96%) with pain, 50 of 64 (78%) with prolapse, and 92 of 96 (95%) with bleeding. No patient required anesthesia throughout the entire procedure. No major complications were encountered with this treatment.

Conclusions: HAL with the Moricorn is a simple, safe, and effective method. However, further observations predicated on a longer follow-up, a larger number of patients, and comparisons with other conventional treatments are called for.

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P. M. Wilkerson, M. Strbac, H. Reece-Smith S. B. Middleton. Doppler-guided haemorrhoidal artery ligation: long-term outcome and patient satisfaction, *Colorectal Dis* 2008, 394-400

Walega P, Scheyer M, Kenig J, Herman RM, Arnold S, Nowak M, Cegielnny T, Two-center experience in the treatment of hemorrhoidal disease using Doppler-guided hemorrhoidal artery ligation: functional results after 1-year follow-up, *Surg Endosc* 2008 22:2379-2383

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