

Doppler Guided Hemorrhoid Artery Ligation:

A New Alternative to Operative Hemorrhoidectomy.

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SECOND DRAFT

Infrequently a new operation is introduced for a common disorder. Doppler Guided Hemorrhoid Artery Ligation (DGHAL) falls into this category and represents a new and exciting advance in the treatment of hemorrhoids. This technique relies on ligation of the hemorrhoidal arterial supply to eliminate hemorrhoidal symptoms. In 1995, Morinaga reported on this innovative method for treating hemorrhoids.¹ He utilized a specially designed proctoscope coupled with a Doppler transducer to identify the hemorrhoidal arteries. Through this instrument he was able to suture ligate these vessels. He reported good results utilizing this technique. We are reporting on the outcome of our first 60 patients thus treated.

There are different types of hemorrhoids and they produce variable symptoms. The types of hemorrhoids and their symptoms govern treatment. Asymptomatic hemorrhoids are ubiquitous and require no treatment. Therapy, which can be directed toward symptomatic hemorrhoids, includes dietary manipulations, bulking agents, stool softeners, injection sclerotherapy and various ablative methods for treating internal hemorrhoids. These include rubber band ligation, infrared photocoagulation and various techniques of operative hemorrhoidectomy in which internal and external hemorrhoids are excised or destroyed. While nonoperative modalities are applicable to the vast majority of hemorrhoids sufferers, there are those who benefit from an operative hemorrhoidectomy. One of the main shortcomings to an operative approach is the potential for substantial or prolonged postoperative pain and incapacity. DGHAL, in most cases, can produce the beneficial effects of an operative hemorrhoidectomy with minimal postoperative pain and incapacity.

Methods

DGHAL was performed as an office procedure with conscious sedation and local anesthesia. This is the standard technique utilized by the authors for most of their anorectal

operations. Conscious sedation initially was intravenous Demerol and Versed administered under the direction of the operating surgeon. Since January 2000, intravenous propofol administered by an anesthesiologist has been used. Some surgeons use no sedation or local anesthesia. However, the authors feel they can operate more precisely with conscious sedation and local anesthesia. The buttocks are retracted with tape strips. Local anesthesia is administered by submucosal and subcutaneous injections of 1/2% bupivacaine containing 100 units of hyaluronidase per 10 milliliters of solution. The Doppler modified proctoscope is then inserted into the anorectum and the 6 hemorrhoidal arteries are identified by their pulsating Doppler sounds. Where difficulty was encountered in identifying one or more vessels, topical 0.2% nitroglycerine cream was applied to the area. This facilitated identification of the arterial pulsations. A #2-0 Polyglactin 910 (Vicryl[®]), figure-of-eight suture ligature was placed around the vessel through the window of the proctoscope. Ligation of the vessel was confirmed by the absence of Doppler sounds distal to the suture. The vessels typically are located around the circumference in the right posterolateral, right midlateral, right anterolateral, left anterolateral, left midlateral and left posterolateral (1,3,5,7,9 and 11 o'clock) positions.

Results

There were 16 female and 44 male patients between the ages those 22 and 87. The mean and median ages were 48. The indications for operation included the symptoms of pain, bleeding, protrusion, recurrent acute attacks of piles, bleeding with anemia and various combinations of bleeding protrusion and pain. They were distributed as per table No. 1. 7 patients (11.67%) had prior hemorrhoid rubber band ligations. One patient had a prior operative hemorrhoidectomy more than 10 years earlier. One patient was HIV positive but was asymptomatic regarding AIDS. One patient underwent a concomitant fistulotomy.

The findings consisted of large internal and external hemorrhoids in 20 patients. In 40 patients there was significant distention and eversion of the external hemorrhoids, along with protrusion of internal hemorrhoids, following defecation. The authors refer to this hemorrhoid configuration, *hemorrhoidal eversion*. Eversion was circumferential in 13 patients, involved 3 major hemorrhoidal groups in 17, 2 major hemorrhoidal groups in seven and a single major hemorrhoidal group in 3 (Table 2). Some of the patients had huge hemorrhoids and their size never precluded a DGHAL.

Of the 3 patients in whom the indication was recurrent acute attacks of piles, none has had a recurrence to date. It is too soon, however, to formulate any conclusion regarding the efficacy of DGHAL in this setting. In 7 patients pain was a chronic problem. DGHAL was not performed in patients who had either single or multiple thrombosed hemorrhoids. The symptoms were then individually evaluated; if they were completely resolved, if they improved but were still occasionally present or if they persisted with little change from preoperatively. Chronic pain was fully resolved in 5, improved in 1 and in 1 there was no improvement. In 51 patients rectal bleeding was a significant symptom. This was eliminated in 45 (88.2%), improved in 4 (7.84%) and was unaffected in 2 (3.92%). Protrusion was the major symptom in 49 patients. This was fully corrected in 45 (91.8%), improved in 2 (4.08%) and was unaffected in 2 (4.08%). (Table 3)

One patient whose symptoms included pain, bleeding and protrusion and one patient with bleeding and protrusion, failed to improve with DGHAL. They subsequently underwent operative hemorrhoidectomy 6 months after the DGHAL with resolution of their hemorrhoidal symptoms.

Complications, when they occurred, were usually minor (Table 4). Most patient's pain could readily be managed with acetaminophen or codeine. Approximately 30% of patients

required oxycodone for 1-2 days for analgesia. Most patients were back at work within 48 hours. 5 Patients were unable to return to work within two days. Constipation is readily prevented or treated with psyllium or stool softeners or other laxatives. In no cases did a fecal impaction occur. There were no cases of significant postoperative bleeding. One patient developed an anal fissure, which healed following an anal dilatation. There were 4 patients who developed perianal thrombosed hemorrhoids postoperatively. These responded to conservative medical measures. There were no instances of impaired continence, urinary retention or fecal impaction.

Discussion

The authors segment their patients with hemorrhoids according to the type of hemorrhoids that are present and the symptoms they produce. The historical view in which hemorrhoids were considered to be varicose veins is now known not to be correct in the majority of cases. Hemorrhoids are viewed as cushions of tissue that line the anal canal. Hemorrhoids are normally present in all humans with rectums. Asymptomatic hemorrhoids require no treatment. The common symptoms are pain, bleeding and protrusion. Most cases of painful hemorrhoids are due to hemorrhoid thromboses or ulcerations associated with these thromboses. These usually resolve spontaneously and the authors treat them nonoperatively with topical anesthetics, witch hazel compresses, mild analgesics, stool softeners or bulk laxatives. Operative manipulations are discouraged for this benign, self-curing condition. Operative intervention may be appropriate in this setting for frequent recurrences.

Bleeding hemorrhoids are in most cases internal hemorrhoids. Those, which are small may, respond to medical therapy with bulk laxatives or stool softeners. If necessary, they can also be treated with injection sclerotherapy, hemorrhoid rubber band ligations or infrared photocoagulation. Larger internal hemorrhoids lend themselves to effective therapy with

hemorrhoid rubber band ligations. Infrequent cases of internal hemorrhoids cannot be eliminated in this simple fashion and operative procedures must be considered.

Protrusion of hemorrhoids can be due to pure external hemorrhoids, internal hemorrhoids, mixed internal and external hemorrhoids or combinations in which in the external hemorrhoids distend (everting hemorrhoids). Pure external hemorrhoids require operative excision. Internal hemorrhoids can often be effectively managed by hemorrhoid rubber band ligations. Everting external hemorrhoids usually do not respond to hemorrhoid rubber band ligations and require operative excision or DGHAL. Administering a phosphate enema and observing the patient after a forceful evacuation is often necessary in order to evaluate the symptom of protrusion. This "*hemorrhoid stress test*," is essential in the assessment of patients who complain of protrusion.

Proctologists always must maintain a historical perspective because of the many proposed remedies and techniques that ultimately failed after initial claims that they can accomplish a painless hemorrhoidectomy. Most of these have been discarded or have found a limited role in modern proctology. Included in this ignominious history are sclerosing agents of a century ago, cryosurgical hemorrhoidectomy of the 1970s and laser hemorrhoidectomy of the 1980s. Thus, one must be skeptical before adopting a new technology directed to hemorrhoids.

When we first learned of DGHAL, we sought it for the management of patients who required an operative hemorrhoidectomy to eliminate their hemorrhoidal symptoms, but in whom there were contraindications to an operative hemorrhoidectomy. We were most concerned regarding those patients who had signs or symptoms of impaired anal continence or in whom we estimated that to be a significant risk, particularly patients over the age of 60. The first patients we treated with DGHAL were patients in that group. Our initial results were spectacular and we

have subsequently offered DGHAL to nearly all patients who we felt required an operative hemorrhoidectomy. The only exception is the small group of patients with pure external hemorrhoids. In this patient group, we feel that excision of the external hemorrhoids is the optimum therapy and we cannot envision similar results from DGHAL. We have also expanded our indication to patients who can be managed with multiple hemorrhoid rubber band ligations and in whom we feel that more than 4-6 ligations would be necessary. We have not used this modality in patients with acute hemorrhoidal thromboses. We have successfully used it in patients with active heavily bleeding hemorrhoids.

Since this procedure was first reported in 1995, longer than 5 year results are lacking. Our short-term results are excellent. Will collateralization around the ligated vessels obviate the early beneficial effects of DGHAL? That answer is unknown at this time. We know we can perform the procedure safely. Symptoms resolve and huge protruding or bleeding hemorrhoids shrink. We do not see acute ischemic symptoms. Some of the pain in the immediate post-procedure period, we postulate, may be ischemic in origin, as well as the anal fissure described above. It is clear that many patients, who would otherwise have to undergo a potentially very painful operative hemorrhoidectomy, prefer this minimally painful option, despite the lack of information regarding longer-term results. We feel our early results merit our enthusiasm for DGHAL.

Abstract

Background

In 1995, a novel replacement for operative hemorrhoidectomy was introduced. This Doppler Guided Hemorrhoids Artery Ligation (DGHAL) effectively accomplished an operative hemorrhoidectomy with far less postoperative pain. This report describes our first 60 patients so treated.

Methods

DGHAL requires an especially designed proctoscope, which is coupled with a Doppler transducer. This allows identification of the hemorrhoidal arteries. There is a window in the device just proximal to the transducer, which allows suture ligation of the hemorrhoidal arteries. The procedure is performed on an ambulatory basis with conscious sedation and rectal local anesthesia.

Results

16 female and 44 male patients between ages 22 and 87 were treated. Indications for operation included chronic hemorrhoidal pain, bleeding with or without anemia, protrusion, recurrent hemorrhoidal thromboses or combinations of these. The symptom of bleeding was fully corrected in 88.2%, protrusion in 91.8% and pain in 71.4%. 2 patients (3.3%) failed to improve with DGHAL and underwent subsequent operative hemorrhoidectomy. Complications included pain resulting in greater than 2 days loss of work in 5 patients, 4 patients developed postoperative perirectal thromboses, single rubber band ligations were required in 4 patients and 1 patient developed an anal fissure. There were no cases of postoperative urinary retention, fecal impaction or impaired continence.

Conclusions

DGHAL is an effective alternative for patients who require an operative hemorrhoidectomy. It may be the only option for patients who require an operative hemorrhoidectomy in order to eliminate their symptoms, but in whom it is contraindicated because of incontinence.

Key Words

Hemorrhoids

Ligation

Doppler

Transducer

Bibliography

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Table 1. INDICATIONS FOR OPERATION

Indications	Number of Patients
Bleeding with anemia	1
Pain and protrusion	1
Pain	2
Protrusion	3
Recurrent thrombosed hemorrhoids	3
Bleeding, pain and protrusion	4
Bleeding	5
Bleeding with protrusion	41
TOTAL	60

Table 2. FINDINGS

Findings	Number of patients
Internal & external hemorrhoids with no eversion	20
Single cushion eversion	3
Double cushion eversion	7
Triple cushion eversion	17
Circumferential eversion	13
TOTAL	60

Table 3. RESULTS

Symptom	# patients	Fully resolved	% Fully resolved	Partially resolved	%Partially improved	No improvement	% No improvement
Recurrent thrombosed hemorrhoids	3	3	100	0	0	0	0
Pain	7	5	71.4	1	14.3	1	14.3
Bleeding	51	45	88.2	4	7.84	2*	3.92
Protrusion	49	45	91.8	2	4.08	2*	4.08

*2 patients underwent subsequent operative hemorrhoidectomy with full resolution of their symptoms.

Table 4. COMPLICATIONS

Complication	Number	%
Pain resulting in >2 days loss of work	5	8.3
Acute attack of piles	4	6.7
Residual protrusion resolved by hemorrhoid rubber band ligation	4	6.7
Subsequent operative hemorrhoidectomy performed for residual symptoms	2	3.3
Anal fissure	1	1.67