



Our Experience with Doppler Guided Haemorrhoidal Artery Ligation in Treating 100 Cases of Symptomatic Grade 3 and Grade 4 Haemorrhoidal Diseases- 1 Year Follow Up

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Abstract

Background: *There are broad ranges of interventions described for treatment of haemorrhoidal disease. Each method has advantage, disadvantage and method specific complications. Doppler guided haemorrhoidal artery ligation with or without added mucopexy is a relatively newer technique for treating haemorrhoidal disease. Our aim is to study the effectiveness, post operative complications and outcome of this newer treatment option in 100 consecutive cases for period of 1 year follow up.*

Materials and Methods: *This prospective clinical study carried out in 100 consecutive patients admitted with grade 3 and grade 4 symptomatic haemorrhoidal diseases. The patients were evaluated preoperatively and postoperatively for improvement of symptoms, complications and recurrence of the symptoms. Follow up period was 1 year.*

Results: *In our study of 100 cases, mean age of the patients was 48.3years. 62% of them presented to us with bleeding per rectum as their major presenting complaint followed by 20% with mucosal prolapse. Average duration of surgery was 43minutes and 85% of patients discharged after 24 hours of observation in hospital. Immediate complications like intra operative and early post operative bleeding, urinary retention had seen in 13% and 10% patients which were managed conservatively. 12% patients had sustained pain at the end of 1 week but 1 month, 6month and 1year follow up there was no pain. No major complications occurred during the study. However 12% patients complained of recurrence of symptoms at the end of 1 year follow up.*

Conclusion: *Doppler guided haemorrhoidal artery ligation with or without additional mucopexy provides a low morbidity minimally invasive option for treatment of haemorrhoidal disease with adequate safety and efficacy and acceptable complication rates.*

Keywords: *Doppler, Mucopexy, Artery ligation.*

Introduction

Hemorrhoids are a leading cause of lower gastrointestinal bleeding with a high impact on quality of life¹. Hemorrhoids are vascular cushions

that lie beneath the epithelial lining of the anal canal; they consist of arterio venous communications mainly between branches from superior rectal artery and others from superior hemorrhoidal artery, or

may be between branches from inferior and middle hemorrhoidal arteries. They are usually found in three main locations: right anterior, right posterior and left lateral portions.

Hemorrhoids are classified as internal or external based on the location from the dentate line. The Goligher system classifies hemorrhoids into four grades or degrees of prolapse; Grade 1 hemorrhoids do not prolapse outside the anal canal. In Grade 2, there is prolapse upon bearing down at defecation, but this retracts spontaneously; Grade 3 hemorrhoids prolapse on bearing down at defecation but require manual reduction. Finally, in Grade 4, there is a persistent non-reducible prolapsed hemorrhoid.

The signs and symptoms of hemorrhoids depend on the type present. Internal hemorrhoids are usually present with painless, bright red rectal bleeding when defecating. Internal hemorrhoids typically cause any combination of itching, bleeding, swelling, and prolapse; External hemorrhoids often result in pain and swelling in the area of the anus.

For symptomatic haemorrhoids that present to the clinic or emergency room, treatments range from non operative medical interventions and outpatient based procedures to surgery. A specific choice of treatment depends on patient's age, severity of disease co morbidities and surgeon preference.

Dietary modification consisting of adequate fluid and water intake and counselling regarding defecation habits form the primary first line treatment for grade 1 and grade 2 symptomatic haemorrhoids.

Non-operative procedures are usually considered first for persistent Grade I-III hemorrhoids. OPD procedures include rubber band ligation, sclerotherapy, cryosurgery, laser therapy, bipolar diathermy, infrared coagulation, radiofrequency coagulation.

For symptomatic Grade III-IV hemorrhoids and hemorrhoids resistant to nonoperative procedures, a surgical approach can be adopted. This is required in only 5-10% of patients². The open and closed haemorrhoidectomy are the most commonly used procedures. The major considerations

accompanying open haemorrhoidectomy are significant postoperative pain and protracted recovery time and complications such as anal stricture³.

Doppler guided haemorrhoid artery ligation (DGHAL) with or without added mucopexy is a non excisional procedure aiming at reduction of symptoms of haemorrhoids by reducing the blood flow to the haemorrhoids. This is also referred as transanal haemorrhoidal dearterialization (THD). Doppler-guided Hemorrhoidal Artery Ligation first described by Morinaga et al⁴ in 1995, this technique can be performed under sedation and/or local anaesthesia.

Doppler-guided transanal hemorrhoidal artery ligation technique consists of ligating the superior hemorrhoidal artery above the dentate line. The interference with the blood supply suppresses the bleeding and volume of the hemorrhoids and symptomatic relief is usually evident within 6-8 weeks. It has the limitation in the treatment of haemorrhoidal disease where anal prolapse is the main symptom. Hence in our study selective mucopexy is added for patients with associated prolapse. It is developed based on Thompson's theory that hemorrhoids are the results of the sliding anal lining mucosa of the anal cushion⁵. The procedure involves stitches which transfix the base of the protruding hemorrhoids, followed by sutures on the entire protruding hemorrhoids, to restore fixation of the cushions to its original position, thus controlling the prolapse.

In our study of these 100 cases we have made an attempt to study the efficacy and outcome of the symptomatic grade 3 and grade 4 haemorrhoids primarily treated with DGHAL with or without added mucopexy.

Materials and Methods

This study was conducted in single institution in 100 consecutive patients with grade 3 and grade 4 symptomatic haemorrhoidal diseases. The patients who had completed complete 1 year follow up were only considered and those who missed out during follow up were excluded from the study.

Selection Criteria

1. Patients aged between 15 to 70yrs
2. Patients with grade3 and grade4 symptomatic haemorrhoids.

Exclusion criteria

1. Patients with complicated haemorrhoids like thrombosed piles
2. Patients with recurrent haemorrhoidal disease
3. Patients had undergone perianal or perrectal procedures for any other diseases.
4. Patients who had received any other modality other than conservative treatment for existing disease.
5. Patients suffering from any other systemic or perianal disease along with haemorrhoids like crohn`s disease

Preoperatively, all patients underwent full clinical examination including digital rectal examination and proctoscopy. All patients above 40 years underwent full colonoscopy before the operation to exclude any colonic pathology.

The instrument used for the procedure was the trans-anal Haemorrhoidal Dearterialisation (THD) kit which included anoscope with a Doppler sensor at the tip, Doppler machine, sutures and needle holder. An enema was given an hour before the procedure to clear the lower part of the bowel.

All the procedures were carried out under sedation. The hemorrhoidal arteries were detected with a Doppler flow meter device built into the proctoscope and ligated with 2/0 absorbable suture (polyglycan), on 5/8 needle, using double stitch. After all detectable arteries were ligated, no more arterial Doppler signals could be detected. Mucopexy was carried out for the pro-lapse using a longitudinal continuous suture with final knot at the proximal fixation point. Up to 6 vessels ligation is done with selective mucopexy to reduce the mucosal prolapse.

After the operation, patients were kept in the ward for 24 hours of observation for detailed assessment of postoperative course and then discharged home. Analgesics, nonsteroidal anti-inflammatory drugs

and laxatives were routinely prescribed for postoperative treatment.

Data collected included patients' demographics and the main presenting symptoms, operative time of the procedure, postoperative pain, postoperative consumption of analgesics, duration of hospital stay, duration to return to work, and postoperative complications. All patients fulfilled 1 year of follow-up period at intervals of 1week, 1 month, 6 months, and 1 year.

The evaluated postoperative complications include the following: (a) complications including postoperative bleeding, severe anal pain, urinary retention, poor wound healing (anal fissure or ulceration), abscess or fistula, incontinence or anal stenosis, and (b) recurrence during follow-up, which was defined by evidence of intermittent bleeding which required additional surgical intervention or prolapsing hemorrhoids.

Results

In our study overall median follow up is 1 year for 100 consecutive cases who had undergone DGHAL with or without added mucopexy for symptomatic grade 3 and grade 4 haemorrhoids.

The study included the patients of age group between 18 to 70 years with average age being 48.3 yrs. Out of 100 cases 69 patients are males and 31 are females.

62 patients presented to clinic and emergency department with bleeding per rectum as their main complaint. 20 patients presented to us with haemorrhoids with mucosal prolapse. 8 patients complained of perianal pain. Whereas 10 patients were seeking consultation for non specific symptoms in which 3 patients had itching, 2 had associated fissure and 5 patients with perianal discomfort and occasional passage of blood in stools.

All the patients were counselled pre operatively for DGHAL with or without mucopexy and given enema to wash distal bowel 1 hour before the planned procedure. The procedure lasted for 35 to 50 minutes with mean average time of 43 minutes.

The number of artery ligations in the peroperative period were between 3 and 7 and the number of stitches in mucopexy procedures were between 3 and 7, knowing that 70% ($n = 62$) of patients underwent at least 5 ligatures and 80% ($n = 20$) underwent at least 5 mucopexy procedure. No significant correlation was found between the post treatment result and the number of ligations placed.

There were 8 cases (8%) of intraoperative bleeding requiring additional haemostatic sutures. Early postoperative bleeding (approximately 75 mL of blood) was reported in 5 patients (5%), on the first day after surgery. The bleeding was successfully managed with sterile anal tamponade (Lockhart-Mummary type).

10 patients developed urine retention in the early postoperative period. All of them were improved conservatively except the two cases that required urethral catheterization.

Most patients were discharged after 24 hours of observation. However 10 patients were discharged 2 days after the surgery, and 3 patients and 2 patients were discharged 3 days after the surgery and five days after the surgery, respectively.

Postoperative pain was easily managed with NSAIDs administered i.v. or p.o. 12 patients complained of persistent pain even after 1 week. But at the end of one month all patients were symptomatically improved and relieved of pain by conservative measures.

74 (74%) were able to return to work by 7th day. 10 patients resumed their work by 11 days while 16 patients took 1 month to resume their work.

During the follow up after 7 days, patients' questionnaire showed transient impairment of the anorectal functions in 18 patients (18%) in the form of urgency in 9 patients, flatus incontinence in 4 patients, tenesmus in 2 patients, and discrimination problems in 3 patients. These complications improved spontaneously within 4 weeks after surgery.

Table showing post operative complications (in percentage)

Complications	Immediate	1 week	1month	6month	1year
Bleeding PR	5	0	10	8	7
Urinary problems	10	9	0	0	0
Post op pain	15	12	0	0	0
Tenesmus	0	2	0	0	0
Fecal incontinence	0	4	0	0	0
Prolapse	0	0	0	5	5
Fistula	0	0	0	0	0
Stenosis					

In a follow-up study conducted one month after the surgery, tenesmus prolapse were not observed. Whereas 10 patients complained of bleeding during defecation. 7 patients improved with conservative management but 3 patients remained symptomatic.

In the follow up examination 6 months after DGHAL with or without mucopexy procedure, there were 5 cases of minor residual hemorrhoidal prolapse and 8 patients reported persistent bleeding. Recurrence of bleeding was observed in 7 patients at the end of 1 year follow up. 5 patients presented with minor prolapse. However none of the patient experienced fistula, fecal incontinence or stenosis during our study

Discussion

The ideal surgical treatment for haemorrhoids can be defined as safe, painless, minimally invasive with minimal costs. Although various methods have been proposed none of them meet all these features. Doppler guided HAL has been established by a recent systematic review of a broad range of surgical interventions for haemorrhoids to be 'a safe, quick and easy initial surgical option'⁶.

Operative haemorrhoidectomy is relatively morbid procedure compared with other non invasive techniques due to extensive dissection and presence of incisions below the dentate line. Non-excisional hemorrhoidectomy techniques are based on the disruption of the blood flow from the superior rectal arteries which feed the hemorrhoidal plexus in the rectal column. During the DGHAL procedure, all

sutures are placed under direct visual control using Doppler probe, so risk of misaligned sutures is greatly reduced.

In a prospective randomized study published by Infantino et al⁷ DGHAL reported to be as effective as stapler haemorrhoidectomy in treating haemorrhoids. Moreover, beside the surgeon's experience, the need for a specialized instrument limits the widespread use of DGHAL.

One of the advantages of this treatment is that, it can be performed in an outpatient setting⁸. However in our study we preferred to hospitalize the patients for 24 hours for follow up and care in view of treating the any possible early complications.

Another advantage of this treatment is the rapid return to work as shown by 74% of our patients resuming their work by the end of 1st week of procedure. This is in agreement with the results obtained by Denoya and colleagues⁹ in their respective studies. The operative time was slightly longer in the DGHAL our study, which is due to our early experience with the procedure There were no statistical difference comparing the number of sutures placed for those with a 'Satisfied' and 'Dissatisfied' outcome.

DGHAL minimizes the post operative risk of postoperative pain and complications. DGHAL does not cut or remove any haemorrhoidal tissue; hence pain and post operative complications are significantly reduced, with long term positive outcome. Stefan Morarasu et al¹⁰, proved the effectiveness of DGHAL in treating haemorrhoidal disease with minimal to no post operative pain. In our study 12 patients experienced pain even after 1 week but none of them termed it as severe and all of them are improved and experienced no pain at the end of 1 month and during follow up.

It is stated that early complications of DGHAL are rare and minor, and include post-operative bleeding (2.4%), urinary retention (< 1.0%), and thrombosis (1.2%), fistula (infection (0.5%) In our study 5% patients experience early post operative bleeding. And all these patients are in the group who had undergone mucopexy along with DGHAL. None of them required re operation or blood transfusion.10%

patients had urinary retention and 8 % passed urine voluntarily while 2% needed catheterization.

In a follow-up study conducted 7 days after the surgery,9% of the patients suffered from urgency however Impairment of the anorectal function in the form of urgency, tenesmus, flatus incontinence and discrimination problems were not there at 1 month, 6month and 1 year follow up.

In the follow up study conducted at 1 month 10 % patients suffered from recurrence of bleeding. 2% patients had fissure and relieved from the symptoms by 6 months on getting treated by conservative methods.

Results from various studies indeed revealed that residual or recurrent protrusion of hemorrhoidal tissue is the main complication after DG HAL in grade IV disease. Faucheron et al¹¹ conducted a follow up study of approximately 34 months in 100 patients with grade 4 haemorrhoids and reported a 9% recurrence rate. In our study, 5% of the patients complained of persistent prolapse and 7% of the patients complained of persistent bleeding after 6 months and 1 year and suggesting 12% of recurrence at the end of 1 year follow up. Advanced grade of haemorrhoids treated in this study could have been responsible for the recurrence.

None of our patients developed anal stenosis. This is probably related to the avoidance of unnecessary ligation sutures around the entire rectal column, which may disturb rectal arterial flow. No thrombosed piles, fistulas, fecal incontinence occurred during study unlike studies by Ratto et al¹². Irrespective of the presenting symptom, the aim of any haemorrhoidal disease intervention is to achieve patient satisfaction. In our series majority of the patients presented with bleeding per rectum as complaint followed by haemorrhoids with mucosal prolapse. In the publication by Dal Monte et al¹², with the longest reported follow-up of 46 months, the success rate, defined as completely resolved symptoms, was 92%. DGHAL with or without mucopexy technique achieved complete control of symptoms in 88% of our patients making it one of the effective treatment options.

This study has limitation that, it was conducted in the cases treated by DGHAL primarily only and not included the cases which received other mode of treatment already. And not included the anomanometric changes following the procedure. The 1 year follow up is very less comparing the course and recurrence possibilities of the disease. Further long term study of DGHAL in complicated haemorrhoids and recurrent haemorrhoids is required.

Conclusion

In conclusion, DGHAL with or without mucopexy for symptomatic grade 3 and grade4 haemorrhoidal disease is a safe and effective procedure. Doppler-guided haemorrhoidal artery ligation is an easy to learn technique. It has advantage of can be done as outpatient procedure, less post operative pain and early recovery and resuming the work. No major complications noted during the study and the minor complications which occurred easily manageable and acceptable. The success rate in terms of improvement in symptoms and patient satisfaction with DGHAL are similar to any other standard procedure for treating haemorrhoidal disease making it an easy alternative effective procedure. However long term follow up study is required to study the effectiveness in term of recurrence and outcome.

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