Doppler Guided Hemorrhoidal Artery Ligation with or without Transanal Rectal Mucopexy: A new approach for Treatment of Hemorrhoids

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Abstract

ABSTRACT: Background: To evaluate a new technique based on Doppler Guided Hemorrhoidal Artery Ligation (DG-HAL) with or without Transanal Rectal Mucopexy (TRM) in treatment of different grades of hemorrhoids. METHODS: From January 2008 till January 2012, 220 (160 males and 60 females) patients underwent doppler guided hemorrhoidal artery ligation (DG-HAL) with or without Transanal Rectal Mucopexy (TRM) according to the degree of hemorrhoidal descent. There were 150 patients with grade II, 60 grade III and 10 grade IV. RESULTS: All patients were submitted to DG-HAL while patients with hemorrhoidal descent (grade III and IV) TRM were added. The mean operation time was 45 minutes and post-operative hospital stay was 0.7 day. Return to work mean time was 5.5 days. Post-operative pain was well tolerated requiring only NSAID injection rather than opioids. Recurrence symptoms occurred in 13 patients. CONCLUSION: DG-HAL with or without TRM is effective method for treatment of grade II and III hemorrhoids with minimal post-operative pain. DG HAL-TRM is less effective in treatment of grade IV hemorrhoids.

KEYWORDS: Doppler, Hemorrhoidal Artery Ligation, Transanal Rectal Mucopexy, Hemorrhoids
NTRODUCTION:

A hemorrhoid is a very common disease affecting 4-35% of the population (1) . Management traditionally depends on the grade of prolapse and the severity of symptoms. Treatment range from dietary manipulation through procedures such as rubber-band ligation, injection sclerotherapy to surgical hemorrhoidectomy. The most widely practiced technique is excisional hemorrhoidectomy, using either open Milligan-Morgan or closed Ferguson method (2,3). Hemorrhoidectomy is currently considered the gold standard for surgical management but is recognized as a painful procedure with a risk of significant complications and remains unpopular with the general population (4). Recently Longo described the stapled hemorrhoidopexy or procedure for prolapsing hemorrhoids (PPH) (5). Randomized controlled trials have demonstrated reduced post-operative pain, reduced operating time and better patient satisfaction (6,7).

However, there has been some concern regarding the potential risk( in unexperienced hands) of bleeding, large bowel obstruction, retroperitoneal sepsis, recto-vaginal fistulae and rectal perforation (8).

Doppler-guided hemorrhoidal artery ligation (DG-HAL) is a relatively new surgical technique for treatment of hemorrhoids first described by Morinaga in 1995 (9). It uses a specially designed proctoscope coupled with a doppler transducer for identification and ligation of hemorrhoidal arteries (10). Ligation of these arteries disrupts the inflow of blood to the hemorrhoidal venous plexuses and subsequently results in cessation of hemorrhoidal bleeding and shrinkage of hemorrhoidal tissue (9).

In order to resolve the symptomatic redundant hemorrhoidal tissue remaining following DG-HAL, the technique was modified at the end of 2005 to additionally include Transanal Rectal Mucopexy (TRM). The principle is to apply mucopexy sutures above prolapsing hemorrhoidal pedicles (11).

PATIENTS AND METHODS:

From January 2008 till January 2012, 220 consecutive patients of which are 160 males and the other 60 were females. Female patients with rectocele were excluded from the study. There were 150 patients who suffered from grade II hemorrhoids, 60 grade III and 10 grade IV according to
Goligher classification \(^{(12)}\). Acute thrombosed hemorrhoids or anal sepsis were excluded. Grade II hemorrhoids patients were submitted to DG-HAL while grade III and grade IV patients were submitted to DG-HAL with TRM.

Indication for surgical intervention is the presence of persistent symptoms in spite of conservative treatment for 1 month.

The patient received Lactulose syrup 15cc BID and Metronidazole 500mg tab BID for five days as part of the preoperative preparation. Night before the surgery the patient was instructed not to take anything by mouth except fluid and was given 2 glycerine suppositories rectally and another 2 glycerine suppositories early in the morning (4hours before the surgery).

The operation were done under saddle subtype of the spinal anesthesia block by giving 4ml of hyperbaric bupivacaine 0.5% + 0.25mg morphine(to ensure adequate anesthesia) injected intrathecal while the patient is in sitting position. The preferred position for the procedure is lithotomy position with slight head down position. After proper sterilization and draping, gradual anal dilatation is done using KY-jelly. The probe of HAL Doppler equipment (HAL-doppler, A.M.I. Agency for Medical Innovations) was inserted to start the search for hemorrhoidal arteries, which are branches of superior rectal artery (Figure 1).
Most often 6 arteries were located in the 1, 3, 5, 7, 9 and 11 o’clock positions (as viewed in the anatomical lithotomy position).

After insertion of the doppler transducer proctoscope, it is slowly rotated to localize the rectal arterial branches 3cm proximal to the dentate line (Figure 2).

![Figure 2. Doppler Transducer Proctoscope localizing the rectal arterial branches 3cm proximal to the dentate line](image)

A double figure-of-eight sutures was placed around each perceived artery through the window of the proctoscope at a depth of 3mm to 6mm from the surface under clear vision by using a 2/0 vicryl suture and 5/8 curved tapered needle (AMI HAL Suture). Using the knot pusher the knot was tightened and pushed towards its proper position (Figure 3).

Correct ligation of an artery was associated with disappearance of the doppler sound distal to the knot.
DG-HAL was sufficient to all grade II hemorrhoids patients while grade III and IV were submitted for transanal rectal mucopexy (TRM) in order to repair the hemorrhoidal descent. After ligation of the arteries, the proctoscope was repositioned to expose the prolapsed hemorrhoid through the space between the proctoscope and the sleeve. Continuous running suture performed from the location of the hemorrhoidal artery ligation to 5mm above the dentate line adding mucopexy of the rectal and proximal mucosa anchoring the descended piles mostly at 3, 7, 11 o’clock of the anus (Figure 4).
At the end of the surgery a schematic paper was obtained from the doppler monitor planning the exact sites of arteries ligated (Figure 5).
Follow up of the patient was weekly during the first month then monthly throughout the next 2 years.

RESULTS:

All (150) patients were submitted to DG-HAL while TRM was added to those with grade III and IV hemorrhoids. The mean operation time was 45 minutes with 0.7 day as the mean of the hospital stay post-operative. Return to work mean time was 5.5 days. Post-operative pain was well tolerated requiring only NSAID injection rather than opioids. Anal fissure occurred in 20 patient requiring xylocaine 2% jelly. Follow up showed recurrence in 13 patients out of 220 (5.9%). Recurrence rate was 3.3% in grade II patients (5 out of 150), 6.6% in grade III patients (4 out of 60) but 30% in grade IV patients (3 out of 10). Recurrent grade II patients were submitted to another DG-HAL, while those grade III & IV, open hemorrhoidectomy was done.

DISCUSSION:

Hemorrhoid is the commonest benign anal disease facing surgeons. As hemorrhoids have different grades, treatments range from dietary manipulation through procedures such as rubber-band ligation, injection sclerotherapy, PPH and surgical excision of the hemorrhoids. While hemorrhoidectomy, and its modifications (open and closed (3), diathermy, ligature (13), and harmonic scalpel) (14), is regarded as the gold standard in terms of efficacy, it carries significant morbidity. The most important and frequent of these from a patient’s perceptive is pain. Other complications include sepsis in 5% and impaired continence for up to 33% (15).

Although stapled hemorrhoidopexy (PPH) has been shown to be as effective as hemorrhoidectomy, but with less pain and quicker return to normal activity, yet may carries risk of bleeding, rectal perforation, recto-vaginal fistulae and large bowel obstruction (16). While this complications are rare (17). Experienced centers also have reported complications as severe as peritonitis requiring Hartmann’s procedure (18).

Doppler Guided-Haemorrhoidal Artery Ligation (DG-HAL) is a minimally invasive technique that is virtually painless and offers an effective alternative to other surgical treatments of symptomatic hemorrhoids. By means of the DG-HAL serves to interrupt the arterial blood supply of the anal cushions, while by means of Transanal Rectal Mucopexy (TRM), using the
modified Doppler Proctoscope to lift the prolapsed hemorrhoids by gathering the mucosa. Subsequently the connective tissue in the collapse hemorrhoids regenerates and in time the prolapse is completely resolved.

Early complications reported for DG-HAL are rare, and minor in nature. Most patients can be discharged as outpatients on the day of surgery. Most patients with grade IV hemorrhoid presented with recurrent symptoms within 3 years of follow up after HAL \(^{19}\), 21% were suffering from grade IV hemorrhoids, and most of them presented with recurrent symptoms within 3 years of follow up. Scheyer et al \(^{20}\) observed a recurrence rate of 15.6% with most cases of residual prolapse occurring in patients treated for grade IV hemorrhoids. In our study recurrent rate was 30% among grade IV hemorrhoids which necessitate surgical hemorrhoidectomy after 1 year. While recurrent rate was 3.3% and 6.6% among grade II and III hemorrhoids respectively.

Conaghan and Farouk \(^{21}\) reported an 8 patients who had recurrent hemorrhoid after undergoing HAL procedure alone and were subsequently treated with HAL-TRM. Scheyer et al \(^{20}\) reported 15% recurrence rate in a series of 308 patients. In our study, the major advantage of DG-HAL ± TRM is the low score of pain which may need diclofenac injection post-operative rather than opioids.

In our study the mean operation time was 0.7 day. Return to normal activity mean time was 5.5 days. Many studies reported that patients who received stapled hemorrhoidopexy (PPH) returned to daily life in an average of 8 to 14 days, and those who received open hemorrhoidectomy took longer 10-24 days \(^{22-23}\).

CONCLUSIONS:
The DG-HAL is a safe procedure, less painful, easy to perform and should be considered as an effective alternative for treatment of symptomatic hemorrhoids especially grade II. DG-HAL and TRM is an effective procedure in treatment of grade III hemorrhoids. Grade IV hemorrhoids are best treated with surgical hemorrhoidectomy, but it can be proposed to DG-HAL with TRM, provided that the patients are aware of the risk of recurrence.

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