Comparison of Doppler Guided Haemorrhoidal Artery Ligation (DG-HAL-RAR) with Open Haemorrhoidectomy

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ABSTRACT

BACKGROUND

Hemorrhoidal disease is a common reason for consultation in proctology and a public health problem responsible for discomfort and urgent request relief. Patients mostly complain of pain, discomfort, bleeding, and itching. Currently, combining an anoscope and a Doppler transducer makes it possible to detect and bind the arteries responsible for congestion selectively thereby reducing the blood flow and thus collapsing haemorrhoids.⁽¹⁾ Doppler-guided ligation of haemorrhoidal vessels is being proposed as a treatment of grade 2 and 3 haemorrhoids.⁽²⁾

METHODS

All patients attending the outpatient department of general surgery at Sri Siddhartha Medical College and Research Institute with characteristics of grade 2 and grade 3 haemorrhoids were included in the study. In this prospective study, we compared the results of open haemorrhoidectomy and DGHAL techniques by means of duration of surgery, postoperative pain, post-operative need for analgesics, post hospital stay, and complications. Ninety-six patients were enrolled in this study and were subsequently divided into two groups of 48 members in each. Group A patients received an open haemorrhoidectomy and Group B received a DGHAL.

RESULTS

Duration of surgery was for DG-HAL group is significantly lesser than open haemorrhoidectomy. Post-operative pain score using VAS was significantly lesser in DG-HAL than open haemorrhoidectomy. Post-operative need for analgesics was significantly lesser in DG-HAL than open haemorrhoidectomy. Post-operative hospital stay, and complications were significantly lesser in DG-HAL group than Open haemorrhoidectomy.

CONCLUSIONS

DG HAL repair seems to be a safe method of treatment of 2nd and 3rd grade haemorrhoidal disease with no major complications and a high rate of good short-term results. DGHAL is more useful when compared to Milligan-Morgan technique in terms of duration of surgery, post-operative pain, post-operative need for analgesics, post-operative hospital stay, as DGHAL reduces the complications in surgery.

KEY WORDS

DG-HAL, Haemorrhoids, Milligan Morgan, Haemorrhoidectomy

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BACKGROUND

Hemorrhoidal disease is a common reason for consultation in proctology and a public health problem responsible for discomfort and urgent relief request. ^(3,4) Patients mostly complain of pain, discomfort, bleeding, and itching. ^(5,6) Different types of modalities have been introduced such as conservative management and excisional treatment including open haemorrhoidectomy, stapled haemorrhoidopexy, sclerotherapy, laser therapy. ^(7,8) However, there is no treatment "Gold Standard". The consensus is partly based on the fact that the indication for surgery depends on the severity of the symptoms which remain subjective but also on the choice of treatment which is based on the grade of haemorrhoids and the local experience of the team. ⁽⁹⁾ Currently, combining an anoscope and a Doppler transducer makes it possible to detect and bind the arteries responsible for congestion selectively thereby to reduce the blood flow and thus collapsing haemorrhoids. ⁽¹⁾ Doppler-guided haemorrhoid artery ligation is a new approach for treating haemorrhoids. ⁽¹⁰⁾ This approach has revolutionized haemorrhoidal surgery. Doppler-guided ligation of haemorrhoidal vessels is being proposed as a treatment of grade 2 and 3 haemorrhoids. ⁽⁹⁾

This technique has been introduced by Morinaga in 1995 or Jespersen in 1992, who used a Doppler proctoscope with an injected sclerosing agent instead of ligation in the classic Morinaga procedure. ^(11,12) The prevalence of haemorrhoids is 39% of the population of whom 44.7% are symptomatic. ⁽¹³⁾ haemorrhoids may be internal or external, depending on its relation to the dentate line. Goligher classifies haemorrhoids based on the degree of prolapse and does not describe the size of haemorrhoids or whether they are isolated or circumferential. These factors are important in the selection of surgical treatment. ^(14,10) Studies have shown that haemorrhoidal bleeding is arterial and not venous because haemorrhage from disrupted haemorrhoids occurs from presinusoidal arterioles that communicate with the sinusoids in this region. This is supported by the bright red appearance and the arterial pH of the blood. ^(15,16)

This study was taken up to compare the new technique (DGHAL) with the open haemorrhoidectomy as well as comparing the duration of the operation, postoperative pain score, postoperative needs for analgesics, post-operative hospital stay and complications.

METHODS

Study design was Prospective study in which All patients attending the outpatient Department of General Surgery at, Sri Siddhartha Hospital and Research Centre, Agalkote who were presenting with clinical features suggestive of 2nd and 3rd degree primary internal haemorrhoids irrespective of gender and duration were included in the study and patients Secondary haemorrhoids secondary to any carcinoma or portal hypertension, paediatric age group below 13 years, grade 1 and grade 4 haemorrhoids, external haemorrhoids, patients with previous haemorrhoids surgery and patients who are unfit for surgery due to co-existing co morbidities were excluded from the study. A detailed proforma was

recorded and lab investigations done. Ethical clearance and informed consent were obtained.

Procedure

All the 96 patients who were included in the study, who had presented with grade 2 and grade 3 haemorrhoids were divided into group A and Group B which included 48 patients in each group. Group A patients underwent open haemorrhoidectomy, where the haemorrhoid tissue is excised which consists of haemorrhoid bundles using a sharp instrument such as scalpel, scissors, electrocautery. It differs from closed haemorrhoidectomy where complete wound closure with absorbable sutures are done, but in open haemorrhoidectomy the incision is left open. Group B patients underwent DG HAL procedure. A specifically designed proctoscope with a side viewing Doppler probe (AMI, Austria) was inserted into the anal canal distal to the dentate line (Doppler wave frequency 8.2 MHz). ⁽²⁾ Then the proctoscope was turned around slowly and the haemorrhoid arteries were found with a Doppler pulse sound. Next, the arteries were ligated with a 2/0 polyglactin braided suture attached to a 5/8 curved needle (ETHICON, U.S.A.), using a knot pusher. ⁽⁸⁾ The figure-of-eight suture was made into a side hole using another type of probe. The site of ligation was 2-3 cm proximal to the dentate line. Then the site of ligations was checked by a Doppler probe and if there were no pulses distal to the ligation, the ligation was considered successful. Typical vessels were in the right posterolateral, middle right and left posterolateral at 1, 3, 5, 7, 9, and 11 o'clock starting from lower midline of anus going clockwise. All detectable vessels were ligated with 4 to 6 ligatures. The surgery was completed when no more prolapsed haemorrhoids or arterial signal was found. After termination of the operation, patients were moved to the post op ward and discharged the following two to four days. After the operation, patients were kept in the ward for 2 to 4 days of observation for a detailed assessment of the postoperative course and then discharged home.

Statistical Analysis

The collected data were entered into an excel sheet. The data was analyzed using SPSS software version 18. Socio demographic data grading of haemorrhoids, type of anaesthesia used, postoperative pain and complications was compared between two groups using chi square test and fisher's exact test. Duration of surgery, post-operative hospital stay is compared between two groups using independent test. We did additional analyses in the per-protocol (PP) population, restricted to those individuals who complied with the protocol. All patients were operated under spinal anesthesia and no patients required general anesthesia. We compared the severity of haemorrhoidal symptoms between groups using a generalized least squares regression model, with the same covariates as the primary outcome. We did some sensitivity analyses that adjusted for severity at randomization (where available), at baseline, and the average of the two. The difference in symptom severity was compared separately for the 1 week, 3rd week and 2-month time points. We analyzed pain in the same manner as symptoms. We compared descriptively the secondary outcome of complications elicited during the complications review interview or from the patient notes 1st week, 3rd week, 2

months after intervention. A planned analysis of the time to recurrence was dropped because of the difficulty of eliciting the time of patient-reported recurrence. The association between the scores and other standard evaluation techniques was assessed using Fisher's exact test. A P- the value of <0.05 was taken as statistically significant.

RESULTS

Ninety-six patients were enrolled in this study and were subsequently divided into two groups of 48 members in each. Group A patients received an Open haemorrhoidectomy and Group B received a DGHAL. Majority of the patients in the study in the age group of 51 to 60 Years with 39 members, patients in 41 to 50 years is 29, total number of patients in 31 to 40 years were 12, number of patients lying in young age group that is 21 to 30 years was 10 patients, number of patients lying in age group 61 to 70 was the least with 6 patients. In Group A, who underwent open haemorrhoidectomy, 22 patients had grade 2 haemorrhoids and 26 patients had grade 3 haemorrhoids. In Group B of 48 patients who underwent DG-HAL, 23 patients presented with grade 2 haemorrhoids and 25 patients presented with grade 3 haemorrhoids. All patients were operated under spinal anaesthesia.

Pain scores were assessed with the help of visual analogue scale from 0 to 9 on the first post op day after surgery. All patients In Group A presented with pain and none of them were painless, whereas in the group B patients, 22 patients had no pain that is score 0. 8 patients in group B presented with score 1, that is very minimal pain and none of the patients in group A fell in this category. 8 patients who underwent open haemorrhoidectomy presented with score 2, which is light pain and 18 patients who underwent DG-HAL presented with pain score 2.17 patients in group A patients who underwent open haemorrhoidectomy presented with grade 3 pain, that is mildly hard, and none of the patients who underwent DG-HAL fell in this category. 23 patients who underwent open haemorrhoidectomy presented with grade 4 pain and none of the patients who underwent DG-HAL fell in this category. Mean Duration of surgery for group A patients who underwent open haemorrhoidectomy was 30.77 min $\pm$ 2.36 SD. Mean duration of surgery in group B patients who underwent DG-HAL is 28.5 min $\pm$ 1.16 SD.

All 96 patients who were enrolled in the study were given IV analgesics (diclofenac) 8th hourly on first day. All the patients who underwent open haemorrhoidectomy were given IV analgesics on the second post op day whereas only 15 patients from group B who underwent DG-HAL needed IV analgesics the second post op day as remaining patients didn't have any pain. 35 patients needed IV analgesics on the 3rd post op day in group A patients, whereas none of the patients in group B needed on this day. 4 patients in group A even presented with mild pain on the 4th post op day and were given IV analgesics, whereas none of the patients in group B needed analgesics this day. Duration of post-operative hospital stay was compared between both groups of patients where duration of hospital stay in group A patients who underwent open haemorrhoidectomy was 3.08 $\pm$ 0.17 SD, the mean

duration of hospital stay in group B patients who underwent DG-HAL is 2.09 $\pm$ 0.16 SD.

Post op complications were assessed before the patients got discharged where bleeding, perineal oedema, urinary retention and painful defecation were the complications. 21 patients in group A, who underwent open haemorrhoidectomy presented with no complications whereas 35 patients in group B presented with no complication. Bleeding was observed in 2 patients in group A and in one patient in group B perineal oedema was present in 8 patients in group A and 2 patients in group B. Urinary retention was observed in 3 patients in group A and none of the patients had this complaint in group B. painful defecation was observed in 14 patients in group A whereas 10 cases were observed in group B.

Pain Score (VAS)	Milligan-Morgan Haemorrhoidectomy, No. (%)	DG-HAL (%)	p
0 (Negligible pain)	0 (0)	22 (45.8)	<0.001
1 (Very minimal pain)	0 (0)	8 (16.6)	
2 (Light pain)	8 (16.6)	18 (37.5)	
3 (Somewhat Hard)	17 (35)	0 (0)	
4 (Hard)	23 (47.9)	0 (0)	
5 (Moderately hard)	0 (0)	0 (0)	
6 (Very hard)	0 (0)	0 (0)	
7 (Severely hard)	0 (0)	0 (0)	
8 (Near Maximum)	0 (0)	0 (0)	
9 (Unbearable)	0 (0)	0 (0)	
Total	48 (100)	48 (100)	

Table 1. Pain Scores According to Visual Analogue Scale

	Milligan Morgan	DG -HAL	t Test Value	p
Mean SD	30.77 $\pm$ 2.36 Min	28.5 $\pm$ 1.16 Min	-5.9635	<0.001

Table 2. Duration of Surgery

Need for Analgesics	Milligan-Morgan No.	DG HAL No.
N0 need	0 (0)	0 (0)
Post op day 1	48 (100)	48 (100)
Post op day 2	48 (100)	15 (31.25)
Post op day 3	35 (72.9)	0 (0)
Post op day 4	4 (08)	0 (0)

Table 3. Patients' Need for Pain Killer

Complication	Milligan-Morgan, No. (%)	DGHAL, No. (%)	p
No Complication	21 (43.75)	35 (72.9)	<0.001
Bleeding	2 (4.1)	1 (2)	
Perineal edema	08 (16.6)	2 (4.1)	
Urinary Retention	3 (6.2)	0 (0)	
Painful Defecation	14 (29.16)	10 (20.3)	

Table 4. Complications

DISCUSSION

Haemorrhoids affect all age populations as seen in this study. Over half of the population affected was above the age of 45 years with male sex predominance. Now a days, surgical treatments of diseases have become minimally invasive and cause less physiologic stress on patients. So new modalities DG-HAL is gaining much more acceptance universally. (17,18) Regarding the type of operation, we compared the duration of the operation, postoperative pain, and postoperative need for analgesics, post-operative hospital stay and complications.

In this study there were 72 male patient and 24 female patient. Male predominance was more in the study. p value is <0.01, so it's a significant difference in both groups in gender distribution. There was a significant difference in duration of surgery in which DG-HAL required lesser duration of surgery when compared to open. In a study conducted in Iran, Hossein Shabahang et al concluded the duration of the operation after

anaesthesia was 27 ± 5.8 minutes in group A MMH patients and 24.1 ± 5.8 min in group B, DG-HAL patients which is supported in our study. Comparing the post-operative pain, the mean was 3.6 ± 0.8 in patients who underwent open haemorrhoidectomy and 1 ± 0.4 in patients who underwent DG-HAL. p value is <0.001 which a significant difference. We analysed that patients who underwent DG-HAL had less post-operative pain than patients who underwent Milligan Morgan haemorrhoidectomy. A study conducted in Qatar Tarek Mohammad Sherif et al concluded Patients in the DG-HAL with RAR group in our study experienced significantly less postoperative pain, significantly less consumption of class II and III analgesics in the postoperative period, and also had significantly earlier passage of stool than patients in the haemorrhoidectomy group. The same results were obtained in most of the similar studies and in our study also.

The number of doses of analgesics in post-operative period was lesser in DG-HAL group than open haemorrhoidectomy. Comparing the duration of post-operative hospital stay, in group A patients who underwent open haemorrhoidectomy was 3.08 ± 0.17 SD, the mean duration of hospital stay in group B patients who underwent DG-HAL is 2.09 ± 0.16 SD. Since p value is <0.001 there was a significant difference in duration of hospital stay between both groups where patients who underwent DG-HAL required lesser duration of hospital stay than open haemorrhoidectomy. Post-operative complications were lesser in DG-HAL group than open haemorrhoidectomy. According to a study by Misra MC et al., which was structurally similar to our study had less complications in DG-HAL group than in open haemorrhoidectomy group, which is supported in our study. In our study, when comparing DGHAL and MMH groups, we observed less postoperative pain, less operative time, less post-operative hospital stay, less need for analgesics in DG-HAL group compared to open haemorrhoidectomy. After 2 month follow up we did not find any complications such as anal stenosis, incontinence or evacuation problems. Our results are supported by Misra MC et al.'s study group.

CONCLUSIONS

DGHAL is more useful when compared to Milligan-Morgan technique in terms of duration of surgery, post-operative pain, post-operative need for analgesics, post-operative hospital stay, as DGHAL reduces the complications in surgery.

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