

Original Research Article

Stapler hemorrhoidectomy versus open hemorrhoidectomy

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ABSTRACT

Background: Hemorrhoidal disease is a painful concern to the sufferer and the treating surgeon. Several methods are available for treatment of hemorrhoids. Milligan Morgan hemorrhoidectomy is the most widely practiced Gold standard surgical technique for the management of 3rd and 4th degree hemorrhoids. Staplers are novel methods known for its simplicity, ease and standardization to an anastomosis.

Methods: A prospective randomized control study was done including 60 consecutive patients. The patients were divided into two groups viz. Stapler hemorrhoidectomy group (SH) and Open (Milligan Morgan) hemorrhoidectomy group (OH). Randomization of the patient and assigning them to either of the group was done by the sealed envelope technique on the morning of the surgery. Pain score data sheet was filled out by the patients postoperatively. Data was analysed using SPSS. Significant difference was estimated using Chi Square test and Student's 't' independent test. Level of significance was taken as 0.05.

Results: Sixty patients in two equal groups were studied. Mean age of the two groups was similar. The male: female ratio was 6.5:1 for the stapled group and 9:1 for the open group. The mean operating time for open group was significantly higher than the stapled group (P = 0.0001). The SH group returned to normal activity significantly early. There was no significant difference in pain score on day one. Pain score was significantly lower for the SH group on days 2 and 3. There was no significant difference in complication between the two groups.

Conclusions: Operative time, duration of hospital stay and return to normal activity were satisfactory with stapler hemorrhoidectomy than the open method. Hence those who can afford the cost of surgery will definitely benefit, though it cannot be prescribed to all patients due to economic constraints. We still suggest long-term follow-up of all stapler hemorrhoidectomy patients.

Keywords: Stapler hemorrhoidectomy, Open hemorrhoidectomy, Milligan Morgan hemorrhoidectomy

INTRODUCTION

Hemorrhoidal disease has been a loathsome affliction of mankind. The exclusive prevalence of this ailment in the human race is acclaimed as a downside to the upright posture adapted as an evolutionary refinement of Homo sapiens. The irksome nature of the hemorrhoidal disease has been of painful concern to the sufferer and the treating surgeon alike. No other single disease entity has so many different treatment modalities advocated from disparate systems of medicine than hemorrhoids. This in itself goes to show that not a single method has escaped

from patient dissatisfaction due to difficulty in compliance, painful convalescence, unacceptable complications and persistence of symptoms.

Modern surgical practice has learnt from experience that surgery as an option is not viable and better avoided in 1st and 2nd degree hemorrhoids. The Milligan Morgan hemorrhoidectomy is the most widely practiced surgical technique for the management of 3rd and 4th degree hemorrhoids and is considered the current Gold standard and has stood the test of time by virtue of its least postoperative complications, cost effectiveness and better long term effects.^{1,2}

Staplers as a mechanical adjunct to surgery replacing the traditional sutures have revolutionized operative procedures over the last decade worldwide due to its simplicity, ease and standardization to an anastomosis.

We conducted a randomized controlled study at Indira Gandhi Government General hospital and Postgraduate Institute in Puducherry in India to compare the stapled hemorrhoidectomy and the Milligan Morgan open hemorrhoidectomy on a set of predetermined parameters. This is a novel venture in this part of the country.

METHODS

A prospective randomized control study was conducted in the Department of Surgery of the Indira Gandhi Government General hospital and Postgraduate Institute, Puducherry in India. The hospital's Ethical Committee approved the study protocol.

A total of 60 consecutive patients were included in this study. The patients were divided into two groups viz. Stapler hemorrhoidectomy group (SH) and Open (Milligan Morgan) hemorrhoidectomy group (OH). Patients of age 30-40 years with internal hemorrhoids Grade 3 and Grade 4 with or without external hemorrhoids were included in the study. Patients with infected or thrombosed hemorrhoids, ASA Grade 3 and above, those who have undergone previous anal surgeries for hemorrhoids or fistula and those with co-existing anorectal conditions like fissure in ano, fistula in ano were excluded from the study.

All patients were admitted 2 days prior to the surgery. Preliminary investigations for fitness of anesthesia and surgery were done which included routine hematological investigations of hemoglobin, total and differential blood cell counts, blood group, blood urea and glucose and serological tests for antibodies of hepatitis B, hepatitis C and HIV, a complete urine examination and an electrocardiogram. A rigid sigmoidoscopy examination was performed on all patients to exclude any, associated rectal or sigmoid pathology.

One day prior to surgery, patients underwent a pre-anesthetic checkup and also were informed by the surgeon about both the procedures and that one of them would be performed on them. All patients were given a cleansing enema the night before and on early morning of surgery. Randomization of the patient and assigning them to either of the group was done by the sealed envelope technique on the morning of the surgery.

Stapled hemorrhoidectomy (SH) was performed according to the technique described by Longo with slight modifications using the PPH set. The PPH 01 consisted of circular anal dilator, pursestring suture anoscope, suture threader and 33 mm hemorrhoidal circular stapler. The procedures were done under regional anaesthesia subarachnoid block.

Description of stapler hemorrhoidectomy procedure

The circular anal dilator was gently inserted and secured into the anus thereby reducing the prolapse of the anoderm and parts of the anal mucous membrane. The circular anal dilator was then fixed to the perianal skin using of 1-0 silk. The obturator of the dilator was removed and replaced with the pursestring anoscope. The 90 degree window in the anoscope was rotated through the anus for application of a 2-0 Prolene (polypropylene, Ethicon, Inc.) pursestring suture. The circular pursestring was placed at 3 to 5 cm above the dentate line with the help of ½ circle, 30 round body needle (NW 841). The pursestring was started at 3 O'clock position moving in clockwise direction and including only the mucosa and submucosa. There were about 3 bites taken in each quadrant of the canal. A second 2-0 polypropylene simple stitch was placed perpendicular and contralaterally at 9 O'clock position. In women, the posterior vaginal wall was checked to avoid inclusion in the pursestring. The hemorrhoidal stapler was opened to its maximum position and the head gently introduced and positioned proximal to the pursestring where upon it was secured. This ensured equal and opposite traction sutures to be passed through the stapling device for a more uniform loading (equal "pull down") of tissue into the drum of the stapler. The stapler was held in the closed position for 30 seconds before and 2 minutes after firing. After extraction of the stapling device, the pursestring anoscope was inserted and the stapled line inspected for uniformity and presence of any bleeding or tears. Any bleeding was handled by under-running the bleeding points with 2-0 silk sutures. The stapler was opened and the completeness of the excised doughnut checked no anal pack was kept into the canal. External dressing was applied. The operating time was defined as the time from beginning of the surgery until the application of the dressing.

Milligan Morgan open hemorrhoidectomy was done for the second group. The external and internal hemorrhoids were excised entirely upto the anorectal ring with help of scissors. The pedicles were doubly suture ligated with help of no.2 chromic catgut. Diathermy was used to achieve hemostasis, the wounds were left open to granulate. No packs were left in anal canal at end of this procedure. All patients received a normal diet postoperatively and were given oral lactulose 15 ml twice daily for preventing hard stools. Patients in both groups were advised same cleaning of the anal region and Sitz baths, and same kind of external dressing applied.

A pain score data sheet (visual analogue scale) was filled out by the patients postoperatively (0 mm indicates no pain and 100 mm indicates maximum pain). Pain scores were evaluated for three consecutive postoperative days by a surgical resident not involved with the operative procedure. Urinary retention was defined as inability to void urine postoperatively for a period of 12 hours or more. Pain therapy consisted of paracetamol 500 mg

daily with intramuscular injectable diclofenac sodium on request. Patients stayed in the hospital for 3 to 5 days. Patients in both groups received postoperative oral metronidazole 400 mg tid for 3 days.

Data was analysed using SPSS. For descriptive statistics mean, standard deviation and percentages were computed. The significant difference of the percentages between the two groups was tested using the Chi Square test. The significant difference in the mean values between the 2 groups was tested using the Student's 't' independent test. For all the tests, level of significance was taken as 0.05.

RESULTS

A total of 60 patients in two equal groups were studied. The age distribution of patients is shown in Table 1. Mean age of the two groups was similar. Majority of the patients (more than 80%) were between 30 to 50 years of age. The two groups were comparable in age. The gender distribution is shown in Table 2. The male: female ratio was 6.5:1 for the stapled group and 9:1 for the open group. There was no statistically significant variation in gender distribution between the two groups.

Table 1: Age distribution of patients in stapler and open hemorrhoidectomy groups.

Age group (years)	Groups n (%)	
	Stapler (n=30)	Open (n=30)
30-40	14 (46.7)	12 (40.0)
41-50	12 (40.0)	14 (46.7)
61-60	4 (13.3)	4 (13.3)
Mean age \pm SD	42.6 \pm 6.4	43.7 \pm 6.08

Table 2: Gender distribution of patients in stapler and open hemorrhoidectomy groups.

Study group	Male N (%)	Female N (%)	Male : female ratio
Stapler	26 (86.7)	4 (13.3)	6.5 : 1
Open	27 (90.0)	3 (10.0)	9 : 1
	$r^2 = 0.162$	$P = 0.688$	

Table 3 shows a comparison of mean operating time, time to passage of first bowel movement and time to return to normal activity for the two groups. The mean operating time for open group was significantly higher than the stapled group ($P=0.0001$). Similarly, the open group had a significantly later return of bowel activity at 37.23 hours compared to 18.37 hours for the stapled group. This was also statistically significant. As regards to return to normal activity, the SH group of patients returned to normal daily activity after a mean of 5.6 \pm 1.16 days compared to 7.77 \pm 1.22 days for the OH group. This difference was significant ($P = 0.0001$). Table 4 shows the comparison of pain scores on days 1, 2 and 3

postoperatively. It was seen that there was no significant difference in pain score on day one. However, pain score was significantly lower for the SH group on days 2 and 3, showing that after the first postoperative day, pain is significantly less for the SH group.

Table 3: Comparison of operating time, first bowel movement, return to normal activities between stapler and open hemorrhoidectomy.

Study group	Operating time (min) Mean \pm SD	First Bowel Movement (hrs) Mean \pm SD	Return to normal daily activities (days) Mean \pm SD
Stapler	24.27 \pm 4.27	18.37 \pm 6.31	5.60 \pm 1.16
Open	35.5 \pm 5.54	37.23 \pm 5.88	7.77 \pm 1.22
'P' value	0.0001	0.0001	0.0001

Table 4: Comparison of pain scores (visual analogue scale) between stapler and open hemorrhoidectomy.

Study Group	Pain Scoring – Visual Analogue Scale (0-100) Mean \pm SD		
	Day 1	Day 2	Day 3
Stapler	52.77 \pm 20.76	38.8 \pm 18.0	24.10 \pm 16.1
Open	57.03 \pm 11.66	72.27 \pm 11.05	49.97 \pm 13.41
'P' value	0.33	0.0001	0.0001

Table 5: Comparison of complications between stapler and open hemorrhoidectomy.

Complications	Stapler Group n (%)	Open Group n (%)	'P' value
Incidence of complications	6/30 (20.00)	9/30 (30.00)	
Bleeding	0	2/30 (6.70)	0.3711
Urinary retention	5 (16.37)	5/30 (16.70)	$r^2 = 0.80$
Bleeding and urinary retention	1 (3.3)	2/30 (6.70)	

The comparison of complications of the two procedures is shown in Table 5. Overall, the SH group had an incidence of complications of 20% compared to 30% for the OH group. This difference was not significant. In the SH group, the predominant complication was urinary retention seen in 5 patients, and bleeding and urinary retention in one patient. In the OH group, again urinary retention was seen in 5 patients, bleeding in 2 patients and both in 2 patients.

DISCUSSION

The criticism aimed at conventional hemorrhoidectomy relate to the pain in the postoperative period, prolonged

hospital stay, perianal wound requiring dressing and long absence from work. Introduction of staplers has eliminated most of the previously mentioned challenges. Stapler hemorrhoidectomy has received much enthusiasm as a novel technique in the surgical treatment of hemorrhoids.³

All conventional surgical methods have aimed only at resecting the prolapsed hemorrhoidal piles. The Longo technique claims to treat the cause of the disease according to a new definition of hemorrhoids. By definition, they include the abnormal anal cushion that cause the symptoms, these cushions are masses of thick submucosa with rich vasculature within the anal canal. They contain blood vessels, smooth muscle and elastic and connective tissue. According to the theory of Thomson, hemorrhoids are the result of gradual prolapse of the anal mucosa due to degradation or rupture of the Treitz ligament and subsequently loss of its attachment to the anal sphincter.⁴ Resection of a circumferential part of the rectal mucosa and submucosa leads to the restoration of this prolapse, offering a better venous drainage of the region.^{5,6} This technique promises better postoperative sensory function for the patient with fewer disturbances in continence, lower incidence of anal stenosis and less pain. The stapler method is technically easy with a short learning curve. In a study, results have been found to be independent of the experience of the surgeon.⁷

Four studies have clearly shown that there was lower incidence of pain in the SH group. Postoperative pain was significantly less for the SH group after postoperative day 1 (day 2, $p=0.0001$, day 3, $p = 0.0001$). On the first postoperative day, no statistically significant difference in pain was seen as compared to the open hemorrhoidectomy (day 1, $p=0.33$). Another study supported this observation in our study.⁸ Epidural analgesic requirements have been found to be less in the stapled hemorrhoidectomy group.⁹ Significantly, less total pain scores were observed in those undergoing stapled hemorrhoidectomy as opposed to open procedures.¹⁰⁻¹³ The quality of pain is supposed to that of a sharp, tearing type in open hemorrhoidectomy while, the stapled group often experience a vague or dull discomfort. However, the placement of the purse string suture too close to the dentate line can result in severe and persistent postoperative pain.¹⁴ The stapled line of >22 mm above the dentate line correlates with a significantly shorter need for postoperative narcotics and earlier return to work.¹⁵ Our policy is to keep the purse string and hence the stapled line at approximately 25 to 40 mm above the dentate line.

The mean operative time was generally shown to be lesser for stapler hemorrhoidectomy than for conventional open surgery.^{10-12,16,17} In our study also it was seen to be statistically significant (stapled 24.27 ± 4.27 min vs 35.5 ± 5.54 min, $P=0.0001$). The duration of hospital stay was shorter in the SH group in this study. This also has been well documented in

previous studies.¹¹ However, in the works of Mehigan et al and Hetzer et al there was no significant difference in the hospital stay between the two groups.^{10,12} Similar to our study findings was the earlier return to work for the stapled hemorrhoidectomy patients as compared to the OH group.^{18,19}

The postoperative complication rate was similar in both the open and stapled groups ($P=0.371$). Urinary retention was the most frequent complication from our observations as was seen by Singer et al.²⁰ It has been reported that 5% of patients undergoing open hemorrhoidectomy experienced secondary hemorrhage whereas none of the patients of the stapled hemorrhoidectomy experienced secondary bleeding a finding observed in our study also.¹⁴ Many studies have shown that the postoperative hemorrhage incidence is similar in both groups.¹⁹ Few reports of rare but fearsome complications have been mentioned in the literature. A case of retroperitoneal sepsis after stapled hemorrhoidectomy has been reported by Molloy and Kingsmore.²¹ Pescatori reported a case of rectovaginal fistula after stapled hemorrhoidectomy.¹⁹ There are 2 case reports of rectal perforation after stapling procedures for hemorrhoids.²² Acute intestinal obstruction because of the closure of the rectum by the purse string suture is also known.²³ In our study, there were no such complications supporting the view that complications probably occurred as a result of lack of adequate experience and can be overcome once the learning curve is passed, a short one at that for stapler hemorrhoidectomy.⁷

CONCLUSION

Very few studies from India have compared stapler hemorrhoidectomy (SH) with open hemorrhoidectomy (OH). This study was, therefore, undertaken to compare the following parameters between two randomly assigned groups of thirty patients each for the two procedures of SH and OH. The SH procedure for hemorrhoids is superior to Milligan-Morgan hemorrhoidectomy in terms of postoperative pain, operative time, duration of hospital stay and return to normal activity. Early functional and symptomatic outcomes have been satisfactory and appear similar to those achieved using conventional techniques. However, it is difficult to recommend stapled hemorrhoidectomy as a procedure of choice for all patients in view of economic considerations. However, for those who can afford the procedure, it offers a benefit of lesser operating time, less postoperative pain after the first day and earlier return to normal activity without increase in complications. We would still suggest long-term follow-up of these patients which will help in patient management.

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REFERENCES

1. Jayaram S, Colguhoun PH, Malthaner RA. Stapled Versus Conventional Surgery for Hemorrhoids. *Cochrane Database Syst Rev*. 2006;18(4):CD005393.
2. Milligan ETC, Morgan CN, Jones CE, Officer R. Surgical anatomy of the anal canal and operative treatment of haemorrhoids. *Lancet*. 1937;ii:1119-24.
3. Beattie GC, Lam JPH, London MA. A prospective evaluation of the introduction of circumferential stapled anoplasty in the management of hemorrhoids and mucosal prolapse. *Colorectal Dis*. 1999;2:137-42.
4. Thomson WH. The nature of haemorrhoids. *Br J Surg*. 1975;62:542-52.
5. Harvrylenko SP. Results of hemorrhoidectomy with the use of Staplers. *Klin Khir*. 1998;6:9-10.
6. Kohlstadt CM, Weber J, Prohm P. Stapler hemorrhoidectomy. A new alternative to conventional methods. *Zentralbl Chir*. 1999;124:238-43.
7. Pernice LM, Bartalucci B, Bencini L, Borri A, Catarzi S, Kroning K. Early and late (ten years) experience with circular stapler hemorrhoidectomy. *Dis Colon Rectum*. 2001;44:836-41.
8. Kirsch JJ, Staude G, Herold A. The Longo and Milligan-Morgan hemorrhoidectomy. A prospective comparative study of 300 patients. *Chirurg*. 2001;72:180-5.
9. Carapeti EA, Kamm MA, McDonald PJ, Phillips RK. Double-blind randomized controlled trial of effect of metronidazole on pain after day-case hemorrhoidectomy. *Lancet*. 1998;351:169-72.
10. Hetzer FH, Demartines N, Handschin AE, Clavien PA. Stapled vs excision hemorrhoidectomy: long-term results of a prospective randomized trial. *Arch Surg*. 2002;137:337-40.
11. Shalaby R, Desoky A. Randomized clinical trial of stapled versus Milligan-Morgan hemorrhoidectomy. *Br J Surg*. 2001;88:1049-53.
12. Mehigan BJ, Monson JR, Hartley JE. Stapling procedure for haemorrhoids versus Milligan-Morgan hemorrhoidectomy: randomized controlled trial. *Lancet*. 2000;355:782-5.
13. Ortiz H, Marzo J, Armendaniz P. Randomized controlled trial of stapled haemorrhoidopexy versus conventional diathermy hemorrhoidectomy. *Br J Surg*. 2002;89:1376-81.
14. Seow-Choen F. Stapled hemorrhoidectomy; pain or gain. *Br J Surg*. 2001;88:1-3.
15. Plocek MD, Kondylis LA, Floyd ND, Reilly JC, Geisler DP, Kondylis PD. Hemorrhoidopexy staple line height predicts return to work. *Dis Colon Rectum*. 2006;49:1905-9.
16. Bikhchandani J, Agarwal PN, Kant R, Malik VK. Randomized controlled trial to compare the early and mid-term results of stapled versus open hemorrhoidectomy. *Am J Surg*. 2005;189:56-60.
17. Lan P, Wu X, Zhou X, Wang J, Zhang L. The safety and efficacy of stapled hemorrhoidectomy in the treatment of hemorrhoids: A systemic review and meta analysis of ten randomized control trials. *Int J Colorectal Dis*. 2006;21:172-8.
18. Nisar PJ, Acheson AG, Neal KR, Scholefield JH. Stapled hemorrhoidopexy compared with conventional hemorrhoidectomy- Systematic review of randomized controlled trials. *Dis Colon Rectum*. 2004;47:1837-45.
19. Pescatori M. Transanal stapled excision of rectal mucosal prolapse. *Tech Coloproctol*. 1997;1:96-8.
20. Molloy RG, Kingsmore D. Life-threatening pelvic sepsis after stapled hemorrhoidectomy. *Lancet*. 2000;355:810.
21. Wong LY, Jiang JK, Chang SC, Lin JK. Rectal perforation: a life-threatening complication of stapled hemorrhoidectomy. *Dis Colon Rectum*. 2003;46:116-7.
22. Cipriani S, Pescatori M. Acute rectal obstruction following PPH hemorrhoidectomy. *Colorectal Disease*. 2002;4:367-70.

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