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Original Research Article

A comparative study of open haemorrhoidectomy and stapled haemorrhoidopexy in grade 3 and 4 haemorrhoids

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ABSTRACT

Background: Haemorrhoids are a common anorectal condition seen in surgical practice. Open haemorrhoidectomy described by Milligan Morgan is a widely used procedure. According to Dr. Antonio Longo, basic pathology of haemorrhoidal disease is prolapse above the haemorrhoidal tissue. He proposed correction of prolapse by resecting the prolapsed suprahaemorrhoidal rectal mucosa using stapler popularly known as stapled haemorrhoidopexy. We aim to compare stapled haemorrhoidopexy with open haemorrhoidectomy in the management of grade 3 and grade 4 haemorrhoids.
Methods: Fifty patients with grade 3 or grade 4 haemorrhoids were included in the study. The 25 patients underwent open haemorrhoidectomy and 25 underwent stapled haemorrhoidopexy. Patients were followed up on day 7, day 15, 1 month, 3 months, 6 months and 1 year for any complications encountered. The two groups were compared for duration of surgery, duration of hospital stay, postoperative pain, postoperative bleeding, urinary retention, anal incontinence, postoperative infection and return to work.
Results: In our study, mean age was 44 years, majority of patients were males and had grade 3 haemorrhoids. Stapled haemorrhoidopexy group had shorter duration of surgery and hospital stay, less postoperative pain, earlier return to work and good patient compliance. In the follow up period there was no postoperative bleeding, no postoperative infection, recurrence, residual prolapse or incontinence in the stapled group.
Conclusions: Stapled haemorrhoidopexy is superior and a safe alternative to open haemorrhoidectomy in management of grade 3 or grade 4 haemorrhoids.

Keywords: Haemorrhoids, Haemorrhoidectomy, Haemorrhoidopexy, Stapler, Open, PPH

INTRODUCTION

The term “haemorrhoid” was first used by Hippocrates and is derived from the Greek adjective “haemorrhoids” which means bleeding (haima=blood, rhoos=flowing). It emphasizes the most prominent symptom in majority of cases.

Haemorrhoids are the most common anorectal disorders encountered in the primary setting defined as the symptomatic enlargement and distal displacement of the normal anal cushions.[1] Various factors are involved in haemorrhoids development include constipation and prolonged straining. 40 percent of population may have had symptoms due to haemorrhoids at some time of their lives, a price possibly that man has to pay following the evolution to the erect posture.

The treatment of haemorrhoids for the two chief symptoms of bleeding and protrusion dates back to the Babylonian era. Hippocrates described the treatment by cautery, which must have been extremely painful in the pre-anaesthetic era.[2] At present there is a variety of treatment available for haemorrhoidal disease. It ranges

from dietary advice and bowel habits, to a number of procedures like mucosal fixation and widening of the anus, to different techniques of excision of internal anal vascular cushions as well as external anal vascular channels. The choice of surgery depends on the severity, type of symptoms, degree of prolapse, the expertise of the operator and equipment available. Close to 40% of patients suffering from haemorrhoids usually require surgery.

Surgical treatment of haemorrhoids is indicated in grade 3 and grade 4 haemorrhoids. In 1937 open haemorrhoidectomy as described by Milligan Morgan has remained the most popular among many techniques proposed.[3] They have a well-known long-term efficacy. Major drawbacks, however, are postoperative pain and protracted wound healing, leading to a significant, although highly variable, postoperative discomfort and prolonged sick leave. In 1995, Dr. Antonio Longo described a new surgical procedure with the use of a circular stapler to avoid drawbacks of open haemorrhoidectomy which is called stapled haemorrhoidopexy. It has emerged as a possible alternative to open hemorrhoidectomy. This technique has been named "minimally invasive procedure for haemorrhoids (MIPH)".[4] Unlike excisional haemorrhoidectomy, stapled haemorrhoidopexy does not aim to excise redundant haemorrhoidal tissue. Instead, stapled haemorrhoidopexy removes a short circumferential segment of rectal mucosa proximal to the dentate line using a circular stapler resulting in effective ligation of the venules feeding the haemorrhoidal plexus and fixes the redundant mucosa higher in the anal canal.

Aims and objectives

Aims and objectives were to compare stapled haemorrhoidopexy with open haemorrhoidectomy in the management of grade 3 and grade 4 haemorrhoids in terms of duration of surgery, duration of hospital stay, post-operative pain, post-operative bleeding, urinary retention, anal incontinence, postoperative infection and the return to work.

METHODS

A prospective observational comparative study was conducted in department of general surgery, D. Y. Patil University, School of Medicine, Nerul, Navi Mumbai over 2 years from May 2019 to May 2021 after obtaining the required ethics committee approval. A total of 50 consecutive eligible patients with grade 3 and 4 haemorrhoids, fulfilling the inclusion criteria, were enrolled. No formal sample size calculation was performed; instead, convenience sampling was used, and all eligible patients presenting during the study period were included.

The patients with grade 3 haemorrhoids which prolapse on defecation require manual reduction and grade 4 haemorrhoids with permanent prolapse were included in the study. The patients with grade 1 and grade 2 haemorrhoids, patients with haemorrhoids with fistula in ano and patients with other anorectal pathologies were excluded from this study.

A detailed history was taken and all patients were subjected to thorough clinical examination including per rectal and proctoscopic examination. Routine lab investigations like blood and urine examination and screening of chest was done. 25 patients underwent stapled procedure performed according to the technique described by Dr. Longo and 25 underwent open conventional haemorrhoidectomy.

Post operatively, patients were assessed regarding the need for analgesics and were given analgesics as and when required. Postop pain evaluation was done using visual analog score. The need for catheterization after surgery was assessed and patient satisfaction after the surgery was asked. Factors like duration of surgery, duration of hospital stay, post-operative pain, post-operative bleeding, urinary retention, anal incontinence, postoperative infection and the return to work were taken into consideration to compare both procedures. The patients were followed up on day 7, day 15, 1 month, 3 months, 6 months and 1 year for any complications encountered.

Statistical methods

The data was analysed using SPSS version 23.0 and MS excel software. Descriptive statistics like Mean and Standard deviation were calculated. Comparative analysis between the two groups were done based on Independent sample 't' test. Tests of significance were applied by using chi square test and Mann Whitney U test. Results and discussions prepared based on statistical methodology.

RESULTS

Out of 25 patients in the stapled haemorrhoidopexy group, 44% were below 40 years of age, 56% were in the age group of 40-60 years. Mean age of patients was 44.4 years in this group. Out of 25 patients in the open haemorrhoidectomy group, 48% were less than 40 years of age, 32% were in the age group of 40 to 60 years and 20% were in the age group of >60 years. Mean age of patients was 44.7 years in this group (Table 1).

In stapled haemorrhoidopexy group, 72% were males and 28% were females. In open haemorrhoidectomy group, 68% were males and 32% were females (Table 2).

In stapled haemorrhoidopexy group, 48% had grade 3 haemorrhoids and 52% had grade 4 haemorrhoids. In open haemorrhoidectomy group, 56% had grade 3 haemorrhoids and 44 % had grade 4 haemorrhoids (Table 3).

In stapled haemorrhoidopexy group, mean duration of surgery was 39.4 minutes ranging from 30 to 45 minutes. In open haemorrhoidectomy group, mean duration of surgery was 47.8 minutes ranging from 35 to 60 minutes. The p value was significant at <0.05 after Mann-Whitney U test.

In stapled haemorrhoidopexy group, 44% patients were discharged after 1 day, 52% patients were discharged within 2 days, and only 4% within 4 days. In open haemorrhoidectomy group, none of the patients were discharged after 1 day. Eight % were discharged within 2 days and 92% between 2 to 4 days (Table 4).

Pain was assessed using a visual analog scale (VAS) where a score of 0 represented no pain and a score of 10 represented the worst pain. The pain scores were significantly higher in the open haemorrhoidectomy group at 12 hours and 24 hours after surgery (Table 5).

Patients were examined at 24 hours after surgery for postoperative bleeding. In stapled haemorrhoidopexy group, no patients had bleeding. In open haemorrhoidectomy group, 8% patients had mild bleeding.

In stapled haemorrhoidopexy group, 12% patients had urinary retention post-surgery. In open haemorrhoidectomy group, 16% patients had urinary retention post-surgery. The P value was significant at <0.05 after Mann-Whitney U test.

In open haemorrhoidectomy group, one patient had postoperative infection while no postoperative infection reported in the stapled group.

In our study no incontinence was noted in both the groups.

In stapled haemorrhoidopexy group, a mean of 5 days' time was noted for return to work. 28% patients returned to work within 3 days and 72% patients returned to work within 7 days. In open haemorrhoidectomy group, a mean of 10 days' time was noted to return to work. 16% patients returned to work by 7 days and 84% returned to work by the end of two weeks (Table 6).

Table 1: Age distribution.

Age (in years)	Stapled haemorrhoidectomy		Open haemorrhoidectomy		Total	
	N	%	N	%	N	%
<40	11	44	12	48	23	46
41-60	14	56	8	32	22	44
>60	0	0	5	20	5	10
Total	25	100	25	100	50	100
Mean±SD	44.4±13.95		44.7±16.95		*p=0.884	

*P value significant at <0.05 after Mann-Whitney U test.

Table 2: Gender distribution.

Gender	Stapled haemorrhoidectomy		Open haemorrhoidectomy		Total	
	N	%	N	%	N	%
Male	18	72	17	68	35	70
Female	7	28	8	32	15	30
Total	25	100	25	100	50	100

Table 3: Grade of haemorrhoids.

Grade	Stapled haemorrhoidectomy		Open haemorrhoidectomy		Total	
	N	%	N	%	N	%
Grade 3	12	48	14	56	26	52
Grade 4	13	52	11	44	24	48
Total	25	100	25	100	50	100

Table 4: Duration of hospital stay.

Duration of hospital stay in days	Stapled		Open		P value*
	N	%	N	%	
Upto 1	11	44	0	0	P<0.001
1-2	13	52	2	8	
2-4	1	4	23	92	
Total	25	100	25	100	

*P value significant at<0.05 after Mann-Whitney U test.

Table 5: Postoperative pain.

Pain scores (VAS)	Mode score open hemorrhoidectomy	Mode score stapled hemorrhoidectomy	P value
VAS (in hours)			
6	5	2	0.112
12	4	2	0.009
24	3	1	<0.001
VAS (in days)			
Day 7	2	1	
Day 15	2	0	
Day 30	1	0	

*P values are obtained based on Chi-square test, p value significant at <0.05.

Table 6: Return to work.

Return to work in days	Stapled		Open		P value*
	N	%	N	%	
<3	7	28	0	0	<0.001*
3-7	18	72	4	16	
7-14	0	0	21	84	
Total	25	100	25	100	
Mean±SD	5.08±1.46		10.76±2.81		

*P value significant at<0.05 after Mann-Whitney U test.

DISCUSSION

Conventional hemorrhoidectomy entails limitations related to increased risk of significant postoperative period, prolonged hospital stay, perianal wound requiring dressing and long absence from work. Application of staplers has obviated most of these earlier stated challenges. Stapled haemorrhoidopexy has received much acceptance as a modern, safe and effective technique for the surgical management of hemorrhoids.[5]

All conventional surgical techniques have aimed only to resect the prolapsed hemorrhoids. The technique described by Dr. Longo has claimed to treat the cause of disease as per a newer definition of hemorrhoids. By definition, these include the abnormal anal cushions that may cause the symptoms, which are masses of thick sub mucosa with a rich vascular supply within the anal canal. They consist of blood vessels, smooth muscle tissue and elastic as well as collagenous connective tissue. This technique allows better postoperative sensory retention for the patient with fewer disturbances related to continence, lower risk of anal stenosis and decrement in pain.[6]

The stapler method is technically easier to master with an easier learning curve. Studies have shown that the results obtained with Stapled haemorrhoidopexy are not dependent on the experience of the surgeon. Some studies have clearly shown that incidence of pain is lesser in the stapled haemorrhoidopexy group. Postoperative pain was also significantly less for the stapled haemorrhoidopexy group on postoperative day 1 (p<0.001). In our study, pain was assessed using a visual analog scale (VAS) where a score of 0 represented no pain and a score of 10 represented the worst pain. The pain scores were significantly higher in the open haemorrhoidectomy group at 12 hours and 24 hours after surgery. Some authors (Tjandra et al) have reported lesser postoperative pain and reduction in analgesic requirement postoperatively.[7]

Proponents of stapled haemorrhoidopexy claim reduction in postoperative pain along with faster recovery compared to conventional surgical techniques. Randomised controlled trials (RCTs) have also confirmed significantly lesser postoperative pain with an earlier return to work. Our data confirm these findings. Another study supported this observation. Significantly, less total pain scores were observed in those undergoing stapled haemorrhoidopexy as opposed to open procedures.[8]

In open hemorrhoidectomy, the pain experienced by the patient is that of a sharp, tearing quality, while patients undergoing a stapled haemorrhoidopexy experience only a dull discomfort which abates with time.

However, postoperative pain of a severe intensity persists if the purse string suture is taken too close to the dentate line which marks the demarcation of the pain insensitive upper anal canal from the pain sensitive lower anal canal with abundant innervation. A stapled line of more than 4cm above the dentate line is found to be important as it portends to lesser time for which the patient requires postoperative analgesia with the earlier return to the work.

A systematic review conducted by Chan and a meta-analysis conducted by Nisar et al along with a study Thejeswi et al and a study by Bhandari et al also proved lesser postoperative pain in the stapled group.[7,9]

The mean operative time was generally shown to be lesser for stapled haemorrhoidopexy than for conventional open surgery. In our study also it was seen to be statistically significant (stapled 39.4±5.06 min versus 47.8±7.08 min, p<0.001). In the present study, duration of surgery is significantly low in the stapled haemorrhoidopexy group which is similar to observation of other studies, for example comparative studies done by Bikhchandani, Mehigan and Rowsell et al.[10-12]

The duration of hospital stay was shorter in the stapled haemorrhoidopexy group in this study. In the open haemorrhoidectomy group, 8% patients were discharged within 2 days, 92 % between 2 to 4 days and none of the patient was discharged after 1 day. In stapled haemorrhoidopexy group, 44% patients were discharged after 1 day, 52% patients were discharged within 2 days, and only 4% within 4 days. This also has been well documented in previous studies. Studies comparing duration of hospital stay conducted by Kim et al, Tjandra et al, Laughlan et al and Goudam et al have reported shorter duration of hospital stay in patients undergoing stapled haemorrhoidopexy. In our study also, the duration of hospital stay is significantly low in the group of patients undergoing stapled haemorrhoidopexy.[7,13,14]

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.[11,15]

Similar to our study findings was the earlier return to work for the stapled haemorrhoidopexy patients as compared to the open haemorrhoidectomy group. In the stapled haemorrhoidopexy group, a mean of 5 day time was noted for return to work. 28% patients returned to work within 3 days and 72% patients returned to work within 7 days. In the open haemorrhoidectomy group, a mean of 10 day time was noted to return to work. Only 16% patients returned to work by within 7 days and 84% returned to work by the end of 2 weeks.

A study conducted by Franc et al reported that patients returned to work at an average of 6.7 days in the stapled haemorrhoidopexy group and 20.7 days in the conventional group (p=0.001).[15]

Assessment of recovery using parameters such as resumption of routine daily activities including work do not seem to be very reliable because multiple other factors play a role to decide these outcomes other than operative factors, such as patient's motivation, uncontrolled external factors such as social factors may influence these outcomes. This unreliability is confirmed by studies reported by Mehigan et al and Rowsell et al in terms of return to activity of daily living.[11,12]

Intraoperative and postoperative bleeding is the most frequent problem encountered both after open haemorrhoidectomy and stapled haemorrhoidopexy. Bleeding following stapled haemorrhoidopexy commonly occurs immediately after surgery or after 7 days. Bleeding occurs along the staple line secondary to an arteriolar bleed, inflammation or due to defective technique resulting in injury to the mucosa or rejection of staples after completion of procedure. In our study, 8% patients in the open haemorrhoidectomy group had mild bleeding (dressing soakage or few drops of blood during defecation). In the stapled haemorrhoidopexy group, no patients had bleeding postoperatively. Bleeding was not present in the cases of stapled haemorrhoidopexy because care was taken before, during and after the stapler was applied ensuring that whole mucosa was involved, giving tamponading effect before and after application of the stapler and avoiding partial firing of stapler.[16]

Few reports of rare but fearsome complications have been mentioned in the literature. A case of retroperitoneal sepsis after stapled hemorrhoidopexy has been reported by Molloy and Kingsmore. Pescatori reported a case of rectovaginal fistula after stapled hemorrhoidopexy.[16] There are 2 case reports of rectal perforation after stapling procedures for hemorrhoids. Acute intestinal obstruction because of the closure of the rectum by the purse string suture is also known. 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 stapled haemorrhoidopexy. We recommend a careful inspection of the stapled suture line to identify and over sew any bleeding site.

It has been reported in a study conducted by Dr. Jean Gravie in which there were no cases of bleeding in the patients who underwent stapled haemorrhoidopexy, a finding observed in our study also. It is also as per the RCTs done in various centers in the United Kingdom by Dr. Davis in which the postoperative bleeding was significantly lower.[17,18]

In our study which included a relevant number of patients with advanced haemorrhoidal prolapse (Grade 4 haemorrhoids), we found that the technique described by Dr. Longo is easy to perform as shown by the significant reduction in duration of surgery.

A main concern about this new technique is the cost of the stapling device. However, social and economic savings related to the faster recovery after stapled haemorrhoidopexy may offset this initial cost.

The postoperative urinary retention was the most frequent complication from our observations as was seen by Singer et al. In the open haemorrhoidectomy group, 16% patients had urinary retention post-surgery. In the stapled

haemorrhoidopexy group, 12% patients had urinary retention post-surgery.[19]

In the open haemorrhoidectomy group, one patient had postoperative infection while no postoperative infection reported in the stapled group.

No report of incontinence was noted in both open group and stapled haemorrhoidopexy group.

Another concern regards the durability of this new technique because there is lack of data in the literature about the long term follow up after stapled haemorrhoidopexy. In the stapled haemorrhoidopexy group analgesic requirement was minimum and did not require daily dressing, whereas patients in the open haemorrhoidectomy group required daily dressing.

Follow up visits required were less in stapled haemorrhoidopexy group as compared to open haemorrhoidectomy group.

All specimens were sent for histopathology examination.

The present study has certain limitations. The sample size was relatively small, and the study was conducted at a single center, which may limit the generalizability of the results. A formal sample size calculation was not performed, and patients were enrolled using convenience sampling, which may introduce selection bias. The follow-up period, though extending to one year, may still be insufficient to evaluate long-term outcomes such as recurrence. In addition, blinding of patients and surgeons was not feasible, which could have influenced the assessment of subjective outcomes like postoperative pain and patient satisfaction.

CONCLUSION

In our study, stapled haemorrhoidopexy is superior to conventional open haemorrhoidectomy in regards to shorter duration of surgery, shorter duration of hospital stays, less postoperative pain and earlier return to work.

Analgesic requirement was minimum and daily dressing was not required in patients undergoing stapled haemorrhoidopexy, whereas daily dressing was required in patients of open haemorrhoidectomy.

Follow up visits required were less in patients of stapled haemorrhoidopexy. The procedure is not associated with major postoperative complications.

Patient compliance is good postoperatively.

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