

## Original Research Article

# Stapled versus open haemorrhoidectomy: a prospective study

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### ABSTRACT

**Background:** In this era of staplers and advanced techniques in surgery Milligan Morgan technique of open haemorrhoidectomy is still considered as gold standard procedure for symptomatic haemorrhoids. Stapler haemorrhoidectomy, even though it is practiced in many centres has not become common due to various factors. The present study was done to compare the efficacy, safety and advantages, if any, of the stapled haemorrhoidectomy to open procedure.

**Methods:** This prospective study was performed in the department of general surgery, Government medical college, Thiruvananthapuram, Kerala over a period of 12 months from March 2015 to March 2016. Symptomatic patients with grade 3 and 4 haemorrhoids were selected for the study. The patients were randomized into two equal groups of 20 each. Group A underwent conventional open haemorrhoidectomy and group B, stapled haemorrhoidectomy.

**Results:** Mean operative time period for group A was  $39.25 \pm 5.5$  minutes and group B was  $26.75 \pm 4.7$  minutes. There was significant difference in the pain score between these procedures on first 3 post-operative days. There was also significant difference in group A and group B which was  $6.55 \pm 1.099$  and  $3.55 \pm 0.759$  days respectively for mean hospital stay and  $9.90 \pm 1.651$  and  $5.70 \pm 0.865$  days respectively for return to normal work.

**Conclusions:** Stapler haemorrhoidectomy is associated with lower pain scores postoperatively and shorter duration of hospital stay with early return to work when compared to conventional open haemorrhoidectomy.

**Keywords:** Milligan Morgan haemorrhoidectomy, Open haemorrhoidectomy, Stapler haemorrhoidectomy, Stapler haemorrhoidopexy

### INTRODUCTION

Haemorrhoidectomy is one of the most commonly performed anorectal surgery worldwide.<sup>1</sup> The nature of haemorrhoids is such that it is troublesome for both patient and surgeon alike. First and second degree haemorrhoids are usually treated conservatively whereas the treatment of third and fourth degree haemorrhoids are surgical.<sup>2</sup> Multiple modalities of treatment has been advocated for this disease worldwide. Open haemorrhoidal surgery aims to remove the haemorrhoids by Fergusson's technique (with closure) or Milligan-Morgan procedure (without closure) of the ensuing defect.<sup>3</sup> Of all modalities the Milligan Morgan method of haemorrhoidectomy is

considered as gold standard and is practiced all over the world.<sup>4</sup> It has stood the test of time in terms of complications, cost and recurrence rate.<sup>5</sup> But it is also associated with severe pain due to sensitive anoderm and prolonged wound healing time due to faecal contamination causing prolonged hospital stay.<sup>6</sup> Due to these complications stapled haemorrhoidectomy which was later renamed as stapler haemorrhoidopexy is being followed in many centres. Stapled haemorrhoidopexy, as developed by Dr. Antonio Longo with use of a circular stapler, has emerged as a possible alternative to open haemorrhoidectomy.<sup>7</sup> Staplers act as mechanical adjunct to surgery which has replaced the traditional sutures and has revolutionized operative procedures over the last few

decades. Studies comparing both techniques revealed less postoperative pain and an earlier return to work in the stapler group, but showed no difference in total hospital stay and overall complications.<sup>8,9</sup> However, severe complications were reported following stapled haemorrhoidectomy in 0.12% of the cases; these complications include sphincter problems, persistent postoperative pain, rectal perforations, and sepsis.<sup>9,10</sup>

We, at department of general surgery, Government medical college, Thiruvananthapuram, Kerala in India, conducted a randomized controlled study to compare the stapled haemorrhoidectomy and the Milligan Morgan open haemorrhoidectomy on a set of predetermined parameters.

## METHODS

Patients were allocated randomly using simple random sampling using software generated random number table statistical package for the social sciences (SPSS) version 21 into two group B and group A. Chi square test was used to find the significant difference of the percentages between the two groups. The mean, standard deviation and percentages were calculated for descriptive statistics. Student's t-test was used to test the significant difference in the mean values between the 2 groups. The significance was taken as 0.05 in all tests.

This study comprised of 40 patients, who were admitted for elective surgery of haemorrhoids under department of general surgery, Government medical college, Thiruvananthapuram, over a 12-month period. Inclusion began in March 2015 and ended in March 2016. Patients were randomized to undergo either the stapled haemorrhoidopexy technique or the Milligan-Morgan technique. Patients were prepared for surgery after thorough clinical evaluation including history, previous history, drug history, abdominal examination, digital rectal examination and proctoscopy, in the outpatient department. Preliminary investigations for surgery and anaesthesia fitness were done, which included routine haematological investigations of complete blood count, blood group, renal function and blood glucose and serological tests for antibodies of hepatitis B surface antigen (HBSAg), hepatitis C virus (HCV) and human immunodeficiency virus (HIV), a urine routine examination, chest X ray and an electrocardiogram (ECG). A sigmoidoscopy was performed on all patients to rule out any rectal or sigmoidal pathology. The above-mentioned procedures were compared in terms of operating time, blood loss, post-operative pain, duration of hospital stay, postoperative complications, and time to return to work.

### *Inclusion criteria*

Third degree hemorrhoids, fourth degree hemorrhoids were included.

### *Exclusion criteria*

Acute thrombosed internal piles, previous anal surgeries and grade 1 and 2 haemorrhoids were excluded.

After admission to hospital, a day prior to surgery, patients underwent a pre-anesthetic checkup. Patient and bystander were informed by the surgeon about both the procedures that one of them would be performed on them. All possible complications were explained in the language understood by them and consent was taken. A cleansing enema was given on the night before and early morning of surgery.

### *Procedure*

Patients were positioned in lithotomy position under spinal anesthesia in both groups.

In group A, a proctoscope is inserted and, when slowly withdrawn, allows the hemorrhoids to prolapse. An artery forceps is applied to the skin element of each hemorrhoid and a second forceps applied to its prolapsing mucosa. V-shaped incision through the skin at the base of the external component is put and the dissection is deepened under the V to develop the plane outside the haemorrhoidal tissue but great care must be exercised to ensure that this dissection is inside the internal sphincter. The muscle fibers should be clearly visualized and preserved. The haemorrhoidal tissue is dissected off the underlying internal sphincter up into the anal canal until its pedicle of mucosa, and the feeding vessels of the plexus only attach it. A transfixation suture is then placed through the pedicle and the hemorrhoid is excised. Skin bridge was preserved between the 3, 7 and 11 positions to prevent stricture. Anal packing done with Ethicon Spongostan.

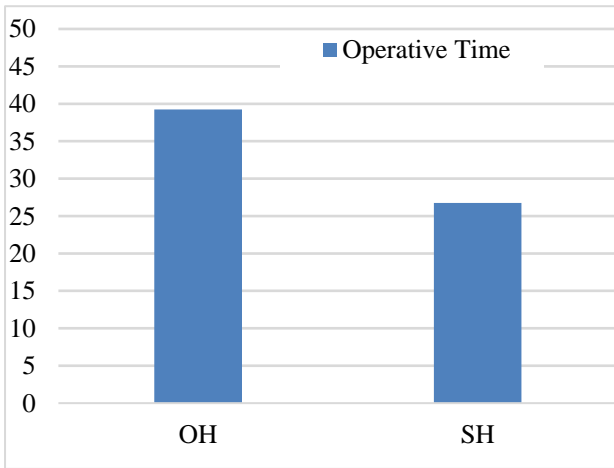
In group B, Ethicon PPH03 was used as standard for all patients in this group. A proctoscope is inserted and, when slowly withdrawn, allows the hemorrhoids to prolapse. A circumferential mucosal purse-string suture using 2-0 prolene is first placed per anum 3–5 cm above the dentate line. Multiple small mucosal bites (around 10-12) are taken without including the sub mucosa. Suture anal speculum was taken out and reinserted before each suture to make sure the sutures are taken in the same line. Tightening of this purse-string will draw mucosa into the stapler. In females lifting of posterior vaginal wall with a Babcock's forceps will prevent the staplers from entering the vaginal wall preventing recto vaginal fistula. When the stapler is closed and fired, a ring of staples is delivered and a doughnut of mucosa is excised which includes the arterial inflow to the upper end of the hemorrhoids. Vascularity is reduced, and prolapsing haemorrhoidal mucosa is drawn back up into the anal canal. Hemostasis is achieved. Anal packing was done with Ethicon Spongostan.

After discharge of patients, they were followed up after 2 weeks and at the end of three months in the outpatient department.

**RESULTS**

Main analysis covered 40 patients, who were studied in two equal groups. Group A consisting of 20 patients undergoing Milligan Morgan open technique of haemorrhoidectomy (OH) and group B consisting 20 patients undergoing stapler haemorrhoidectomy (SH). Study included patients from different age groups ranging from 24 to 51 years. Mean age being 35.7 for group A and 33.6 for group B. There were no significant difference in male-female ratio in group A but there was predominance of males in group B, 65% males and 35% females.

There was no significant difference in operative time between both groups. The operative procedures were standardised and performed by experienced surgeon. Mean time period for group A was 39.25 minutes and group B was 26.75 minutes. Longest time period for group A was 60 minutes and group B was 38 minutes (Figure 1).



**Figure 1: Graph showing comparison of mean operative time in different type of surgery.**

When blood loss between both surgeries were compared group A had a blood loss of 39.5 ml and group B 26 ml with a standard deviation of 5 for both groups (Table 1).

**Table 1: Comparison of mean blood loss in the subject among different type of surgery.**

Blood loss	Mean	Standard deviation	P value
OH	39.50	5.826	<0.001
SH	26.00	5.026	

Pain was evaluated by visual analogue score (VAS). When comparing pain on post-operative day 1, 2 and 3, there was significant difference between both surgeries on all three days. First post-operative day mean score for group A was 7.6, which was high when compared to 4.25 of group B with a standard deviation of 0.75 and 0.96 respectively. Day 2 the score was comparatively lower than day1 but group A was 6.1 and group B was 2.8 in VAS. On day three the score was 5.5 and 2.7 for OH and SH respectively (Table 2).

**Table 2: Comparison of mean postoperative pain in different type of surgery.**

Postoperative pain	Surgey	Mean	Standard deviation	P value
Day 1	OH	7.60	0.754	<0.001
	SH	4.25	0.967	
Day 2	OH	6.10	1.165	<0.001
	SH	2.85	1.089	
Day 3	OH	5.50	1.100	<0.001
	SH	2.70	1.129	

When the complication rate was studied both procedures had very low complication rates with almost no dreaded complications like rectovaginal fistula or sepsis. There were two cases of secondary bleeding (SB) in both groups and which were treated conservatively. No second surgery was performed. Two cases of urinary retention (UR) was reported in group A (Table 3).

**Table 3: Distribution of subject according to complication and type of surgery.**

Complications	Surgery		Total	P value
	OH	SH		
NIL (%)	18 (90.0)	15 (75.0)	33 (82.5)	0.195
SB (%)	2 (10.0)	2 (10.0)	4 (10.0)	
UR (%)	3 (15)	0 (0)	3 (7.5)	
Total (%)	20 (100.0)	20 (100.0)	40 (100.0)	

Hospital stay was more in case of OH when compared to SH group. The mean hospital stay for group A was 6.55 with a standard deviation of 1.099 and group B with a mean hospital stay of 3.55 days and a standard deviation of 0.759 and p value <0.001 (Table 4).

**Table 4: Comparison of mean hospital stay.**

Hospital stay	Mean	Standard deviation	P value
OH	6.55	1.099	<0.001
SH	3.55	0.759	

After discharge of patients they were followed up after 2 weeks and 3 months in the outpatient department. Return to normal work was noted during this period. Mean duration of return to work was found to be 9.9 days for OH and 5.7 days for group B with a standard deviation of 1.65 and 0.86 respectively with a p value <0.001 (Table 5).

**Table 5: Comparison of mean time to return to work.**

Time to return to work	Mean	Standard deviation	P value
OH	9.90	1.651	<0.001
SH	5.70	0.865	

## DISCUSSION

Milligan Morgan technique one of the most commonly preferred surgery for grade 2 and 3 haemorrhoids due to its accuracy. The extent of excision can very well be controlled by the surgeon. Proper knowledge regarding anatomy of the anal canal and surgical technique is most important in performing any kind of anal procedure.<sup>11</sup> But the main criticism against the Open method is in relation to pain, perianal dressing and wound care, longer period of hospital and longer time to return to normal work. Stapler haemorrhoidectomy has become the prime choice for surgeons due to the above factors.<sup>12</sup> 3 studies supported our finding of pain following SH was low when compared to OH even up to post-operative day 3.<sup>1,8,13</sup> Pain following SH is due to close proximity of dentate line and with the purse string suture. In our study we have placed these sutures 3-5 cm above the dentate line. In a study conducted by Plocek et al has shown that a staple line more than 22 mm above the dentate line will reduce the need of post-operative analgesics and help in earlier return to work.<sup>14</sup>

The mean operative time and blood loss in both procedures were found to be more or less same and this did not make any significant difference in the management. Similar were the results of studies conducted by Wani et al.<sup>15</sup> Urinary retention was seen in 3 cases of OH which could be attributed to the pain and also there were two cases of secondary bleeding in SH and OH. Similar were the finding of Molloy et al.<sup>19</sup> There were no serious complications reported in our study but many previous studies have shown that serious and life threatening complications like sepsis, rectovaginal fistula, rectal perforation and even intestinal obstruction may arise following SH procedure.<sup>16-18</sup> We had standardised the technique of lifting up post vaginal wall using an atraumatic Babcock forceps to avoid inclusion of posterior vaginal wall into the stapler line leading to rectovaginal fistula. Taking multiple small bites of mucosa also helped in preventing full thickness stapler lines preventing perforation and staple line stenosis. Hospital stay when compared showed shorter mean hospital stay of 3.5 days for SH when compared to OH duration of 6.5 days. This also adds to the longer mean duration of return to normal work of 9.9 days in OH and 5.7 days in case of SH. Nisar et al in their study had similar results in their comparative study of open and stapler hemorrhoidectomy.<sup>20</sup> Cost of the stapler and learning curve of the surgical technique seems to be a limiting factor in recommending stapler haemorrhoidectomy as the procedure of choice for all patients. The present study has many limitations, including the single centre setting which reduces the external validity. Also, the sample size was relatively low. Our follow up period was short, which could be another shortcoming.

## CONCLUSION

From our prospective study we conclude that stapler haemorrhoidectomy is associated with lower pain scores

postoperatively and shorter duration of hospital stay with early return to work when compared to conventional open haemorrhoidectomy. Even though there was no added advantage in relation to operative time and blood loss, stapler haemorrhoidectomy definitely seems to have an edge over open technique. Cost of the stapler and learning curve of the surgical technique seems to be a limiting factor in recommending stapler haemorrhoidectomy as the procedure of choice for all patients. However, for patients who can afford the procedure, and if the surgeon is competent for the procedure, it offers a benefit of lesser operating time, less postoperative pain, earlier discharge from hospital and earlier return to normal activity. Since the follow up was done for 3 months it would be difficult to comment on the recurrence rate of both procedure. Hence a long-term follow up is required to have a better knowledge regarding recurrence.

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