

**Original article****Stapled and open haemorrhoidectomy; A comparative study of early outcome.**Md. Abdul Jalil<sup>1</sup>, Md Emdadul Hassan<sup>2</sup>, Khadijatul Kobra<sup>3</sup>, Md. Omar Faruk<sup>4</sup>, M Mohibul Aziz<sup>5</sup>.**Abstract**

**Background:** Stapled Hemorrhoidectomy is more popular alternative, has higher safety profile, and quickly established than the open Hemorrhoidectomy procedure. **Objective:** The study aimed to compare between the early post-operative outcomes of open haemorrhoidectomy and stapled. **Methods:** A total of 50 patients between the age group 20 to 70 years who were diagnosed with grade 3 and grade 4 hemorrhoids, were divided into two groups equally. Stapled haemorrhoidectomy contains 25 Patients undergoing and Open haemorrhoidectomy contains 25 Patients. Comparative analysis between the two groups were done based on student's T test using SPSS 24 software version. The level of significance was set to 5% ( $p < 0.05$ ). **Results:** There were 52% males and 48% females in Stapled haemorrhoidectomy groups and 64% males and 36% females in open haemorrhoidectomy group. 48% patients had grade 3 and 52% had grade 4 hemorrhoids in Stapled haemorrhoidectomy groups, and 44% had grade 3 and 56% had grade 4 hemorrhoids in open haemorrhoidectomy groups. In 16% of patients in stapled haemorrhoidectomy group and 24% of patients in open haemorrhoidectomy group blood loss was seen. In 12% of patients with staple haemorrhoidectomy and in 20% of patients with open haemorrhoidectomy was necessary supportive stitching. 52% of patients in open haemorrhoidectomy was observed residential prolapse but not in stapled haemorrhoidectomy patients. In the stapled group the duration of hospital stay (in days) was  $1.96 \pm 0.82$  days as compared to  $3.98 \pm 0.78$  days in the open group. Comparing to only 4% in the open group, 80% patients were discharged within 2 days in stapled group. In the open group at the end of 4 days 72% were discharged. **Conclusions:** Open haemorrhoidectomy at Milligan-Morgan is not easy as stapled haemorrhoidectomy involves shorter operation, fewer postoperative pain and an analgesic need, shorter hospital stays and a faster rehabilitation, earlier work back, the study confirms.

**Keywords:** Stapler haemorrhoidectomy; Milligan Morgan haemorrhoidectomy; Surgical procedures; Hemorrhoids; Piles

Bangladesh Journal of Medical Science Vol. 21 No. 02 April'22 Page : 438-443

DOI: <http://doi.org/10.3329/bjms.v21i2.58079>**Introduction**

Haemorrhoids are most common anorectal problems. Surgery is useful management of third- and fourth-degree haemorrhoids<sup>1</sup>. Haemorrhoidectomy is common performed operation and among the various surgical techniques applied, the most popular technique has been Milligan-Morgan haemorrhoidectomy<sup>2,3</sup>. By using the circular anal stapler (Longo-Milito) is said to decrease the postoperative pain and allow early return to work among the newer modalities of treatment, haemorrhoidectomy performed, but causes postoperative pain which needs about 2-3 days hospital stay and convalescence of at least

one month, Surgical haemorrhoidectomy has been reputed as being a painful procedure for benign disease<sup>4,7</sup>.

In the hemorrhoidal disease, blood loss, mucosal or faecal soiling, itching, and occasional pain are caused by the symptomatic aggregations of this subepithelial tissue<sup>8</sup>. Haemorrhoids grading depends on tendency to prolapse and their severity. In haemorrhoids of grade 1 and 2, ligation of the rubber belt and/or injection scleropathy is reserved. In grade 3 and 4 haemorrhoids owing to persistent prolapse, surgery is essential. The two main modalities of treatment for grade 3 and 4 haemorrhoids were open (Milligan Morgan) and closed

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(Ferguson) techniques, through the years, until the 1990s, alterations have been made, but still causing patient distress. Various procedures have been devised to combat the complications that occurred in conventional open haemorrhoidectomy, such as rubber band ligation, injection sclerotherapy, infrared photocoagulation, cryotherapy, diathermy haemorrhoidectomy and stapled haemorrhoidectomy amongst others<sup>9</sup>. The most widely practiced surgical technique used for the management of third- and fourth-degree haemorrhoids is Milligan-Morgan open haemorrhoidectomy and the current "gold standard" is considered. Anal pain, acute retention of urine, anal stenosis and incontinence is the evident of some early and late postoperative complications<sup>10-12</sup>. Round stapled haemorrhoidectomy (SH) was first described as an alternative to the conventional incision 1998 (CH) by Longo<sup>13</sup>. Stapled haemorrhoidectomy has been found to be less painful and associated with faster recovery than conventional excisional hemorrhoid treatment in some randomized controlled trials<sup>12,14-15</sup>. All reports suggest better patient acceptance and greater adherence to daily procedures, which can make it cheaper. Another randomized controlled trial study found that patients were significantly more likely to have long-term round staple haemorrhoidectomy, and patients with staple haemorrhoidectomy reported significantly higher proportions of prolapse symptoms than those who had conventional haemorrhoidectomy(CH)<sup>12,16</sup>. We compared open and stapled haemorrhoidectomy procedures (early) by in terms of operative time, postoperative pain, hospital stay, length of absence from work or disability time, and complications.

## Methods

A prospective comparative Hospital based study was conducted at IbnSina Medical College & Hospital, Dhaka. A sample size of 50 subjects was calculated by assuming that the average operating time in the staple group was about 30 minutes and 43.25 minutes in the open group. A total of 50 patients aged 20 to 70 years diagnosed with grade III and grade IV hemorrhoids were recruited in the study consecutively by convenient sampling till the sample size is reached. A signed informed consent was obtained for all subjects, confidentiality of the study participants was maintained. The data collection for the study was done between July 2018 to June 2020 for a period of 2 years including follow-up. Stapler haemorrhoidectomy (25 patients) and Open haemorrhoidectomy/Milligan Morgan (25 patients). A thorough clinical history, clinical examination, and proctoscopy were used to evaluate the participants.

**Technique:** Surgery was performed under spinal anesthesia, with patient in lithotomy position. After preparing the anal canal (operating surface) and performing a Proctoscopy examination, SH was performed. A transparent anal dilator was gently inserted and sutured to the perianal skin before inserting the suture anoscope via a mucosal purse-string

suture 1.5-2.5 cm above the dentate line. Later, the purse-string suture was anchored to the fully opened stapling device by guiding its two ends through the stapler's lateral openings. The stapler was closed with continued suture traction until the maximum was reached. The stapler was deployed and held in place for 2 minutes after which it was opened with one and a half turn and gently removed. The doughnut was verified. The staple line was checked for its position above the dentate line, and bleeding sites were hemostatized with cautery or suture ligatures.

In open technique, Artery forceps are applied to the skin-covered external components of haemorrhoid and traction exerted to reveal the internal components which are also grasped by artery forceps. With scissors or cutting diathermy a V-shaped cut is created around the skin holding artery forceps. The dissection proceeds up the anal canal, with the sides of the mucosal dissection converging towards the pile apex and with internal sphincter visible and separate from the dissected pile. Pedicle is ligated at this level by vicryl (2/0). The pile is excised well distal to the ligature and the wound left open to heal. The procedure was repeated for the remaining haemorrhoid. During this time, all complications and their responses to treatment were documented. The cost was calculated based on the length of hospital stay, the time it took to resume normal activities in both groups, and all patients were followed up on for 6 months after surgery to assess the development of recurrence and long-term complications such as anal stenosis and anal incontinence.

**Ethical approval:** The study was approved by the Institutional Ethics Committee.

## Results

Out of 25 patients in the stapled haemorrhoidectomy group, 24% were in the age group 21-30 years, 28% in the age group 31-40 years, 32% in the age group 41-50 years, 12% in the age group 51-60 years and 4% in the age group 61-70 years. In the open haemorrhoidectomy group, 28% were in the age group 21-30 years, 24% were in the age group 31-40 years, 28% were in the age group 41-50 years, 16% in the age group 51-60 years and 4% in the age group >60 years. Out of 25 patients, 48% patients had Grade 3 hemorrhoids in stapled haemorrhoidectomy and 44% in open haemorrhoidectomy groups, and 52% had grade 4 hemorrhoids in stapled haemorrhoidectomy and 56% in open haemorrhoidectomy groups. In the stapled haemorrhoidectomy group, 36% underwent surgery within 20 - 30 min. The mean duration of surgery was 33.2±6.23 min, ranging from 25 to 55 minutes. The mean duration of open haemorrhoidectomy was 44.6±9.21 minutes, with a range of 25 to 55 minutes. Duration of surgery was significantly lower in Stapled haemorrhoidectomy group. Blood loss was seen in 16% of patients in stapled haemorrhoidectomy group and 24% of patients in open haemorrhoidectomy group. Supportive stitch was required in 12% of patients in stapled haemorrhoidectomy

group and 20% of patients in open haemorrhoidectomy group. Residual prolapse was observed in 50% of open haemorrhoidectomy patients but not in any of the stapled haemorrhoidectomy patients. Out of 25 patients all experience mild pain after Stapled Haemorrhoidectomy on day 1 and day 2 post-operative day and severe pain after of open Haemorrhoidectomy on day 1 and day 2 post-operative day, moderate pain on day 3, day 4 post-operative day mild pain on day 5 post-operative day. The mean duration of hospital stay (in days) was  $1.96 \pm 0.82$  days in the stapled group as compared to  $3.98 \pm 0.78$  days in the open group. In the stapled group, 80 percent were discharged within two days, compared to only 4 percent in the open group. In the open group, 72 percent were discharged after four days. The stapled group has a significantly shorter hospital stay ( $p < 0.001$ ).

**Table I:** Comparison of age of the patients between two groups (n=50)

Age (in years)	Stapled Haemorrhoidectomy		Open Haemorrhoidectomy		p-value
	n=25	%	n=25	%	
21-30	6	24.0	7	28.0	0.724ns
31-40	7	28.0	6	24.0	
41-50	8	32.0	7	28.0	
51-60	3	12.0	4	16.0	
61-70	1	4.0	1	4.0	
Total	25	100.0	25	100.0	
Mean±SD	41.7±10.6		42.8±11.3		

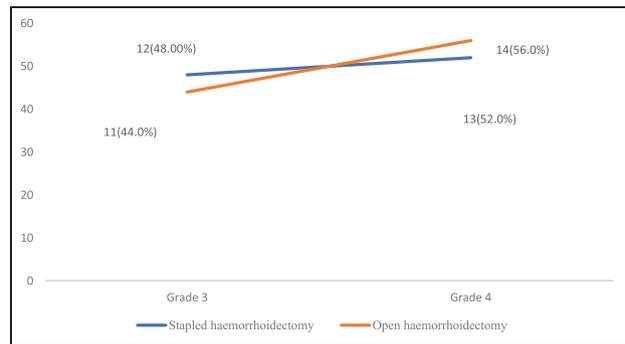
Data were expressed as frequency and percentage and mean±SD, Unpaired student t-test was performed to compare between two groups, ns = not significant

**Table II:** Comparison of duration of surgery (minutes) of patients in two groups (n=50)

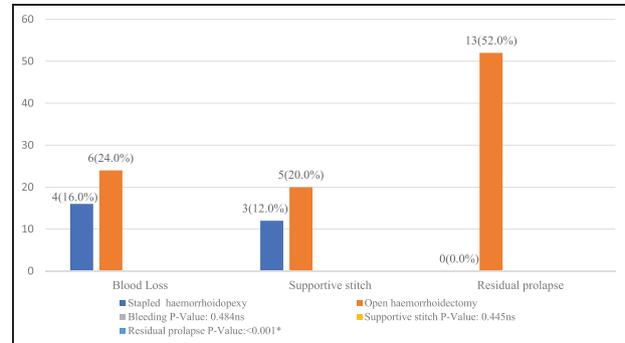
Duration of surgery	Stapled Haemorrhoidectomy		Open Haemorrhoidectomy		p-value
	n=25	%	n=25	%	
20-30 min	9	36.0	6	34.0	<0.001*
31-60 min	16	64.0	14	66.0	
Total	25	100.0	25	100.0	
Mean±SD	33.2±6.23		44.6±9.21		

**Table III:** Comparison of duration of hospital stay in days in two groups (n=50)

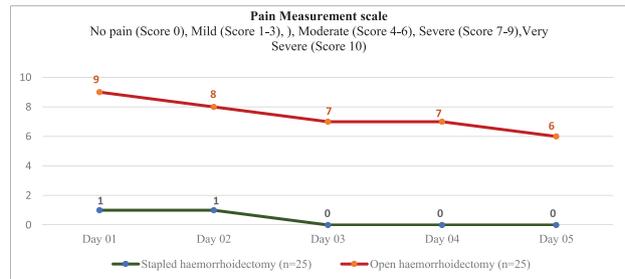
Duration of hospital stay (days)	Stapled Haemorrhoidectomy		Open Haemorrhoidectomy		p-value
	n=25	%	n=25	%	
Up to 2	20	80.0	1	4.0	<0.001*
2-4	5	20.0	18	72.0	
>4	0	0.0	6	24.0	
Total	25	100.0	25	100.0	
Mean±SD	1.96±0.82		3.98±0.78		



**Figure I:** Comparison of grade of disease of patients in two groups (n=50)



**Figure II:** Comparison of per operative findings in two groups (n=50)

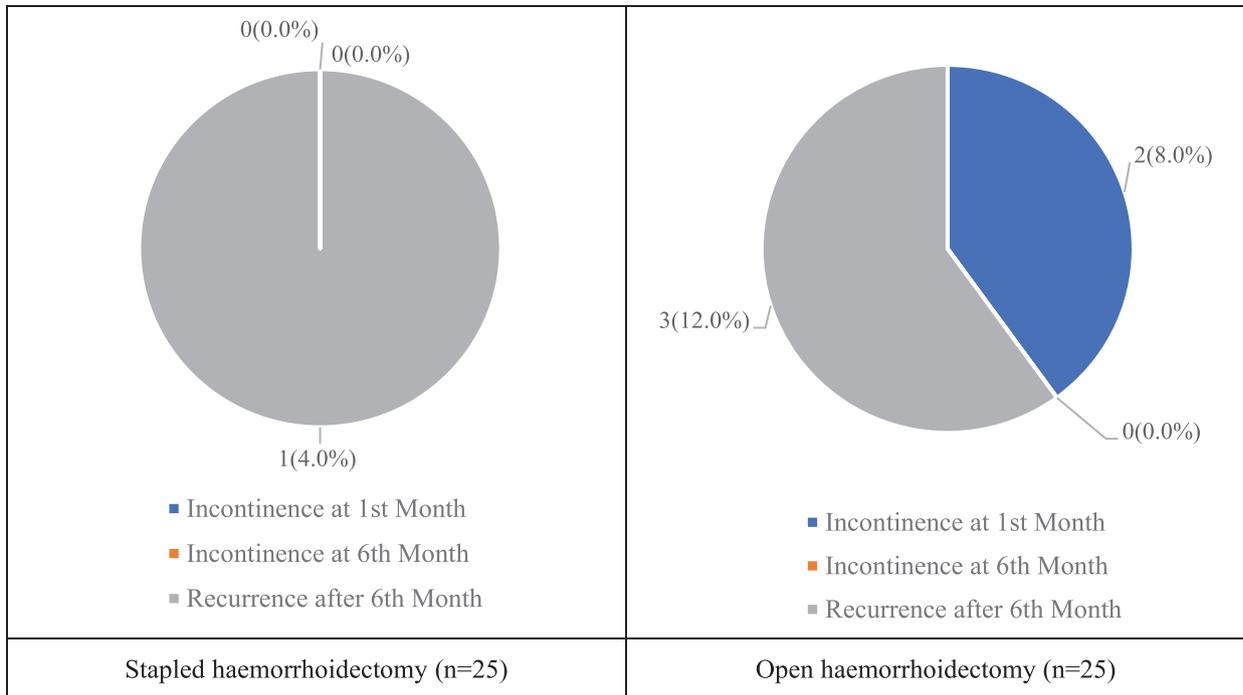


**Figure III:** Comparison of post-surgery pain measurement in two groups (n=50)

**Discussion**

Conventional haemorrhoidectomy can disrupt the activities of daily life due to severe postoperative pain and can lead to chronic bleeding due to delayed healing of peri-anal lesions.<sup>22</sup> On the other hand, stapled haemorrhoidectomy offers theoretical advantages because of no dissection of the peri-anal skin is performed in this procedure. Thus, the risk of bleeding and acute pain is low. In our study we compared open haemorrhoidectomy and stapled haemorrhoidectomy procedures in terms of time of operation, operative pain, hospital stay, time of absence from work or disability, and complications.

It was a hospital-based study conducted in the Department of General Surgery, IbnSina Medical College and Hospital for a period of two year. This was a potential study comparing Milligan Morgan haemorrhoidectomy



**Figure IV:** Comparison of Outcome (follow up) status in two groups (n=50)

and stapled haemorrhoidectomy to manage grade 3 and 4 haemorrhoids. In the current study of 25 patients in the stapled haemorrhoidectomy group, 24% were 21-30 years old, 28% were 31-40 years old, 32% were 41-50 years old, 12% were 51-60 years old and 4% were 70 years old. In the open haemorrhoidectomy group, 28% are 21-30 years old, 24% are 31-40 years old, 28% are 41-50 years old, 16% are 51-60 years old and 4% are 70 years old. The average age of patients was  $41.7 \pm 10.6$  years and  $42.8 \pm 11.3$  years in the stapled haemorrhoidectomy and open haemorrhoidectomy groups, respectively. By the current study, Mengalet al.<sup>22</sup> reported that the average age was  $43.96 \pm 8.42$  years in the staple haemorrhoidectomy group and  $43.12 \pm 6.25$  years in the conventional haemorrhoidectomy group.

Of the 25 patients in this series, 48% had grade 3 haemorrhoids in staple haemorrhoidectomy and 44% in the open haemorrhoidectomy group and 52% in grade 4 staple haemorrhoidectomy and 56% in grade 4 haemorrhoidectomy in open haemorrhoidectomy. In both groups, 46% of patients had grade 3 and 54% had grade 4 haemorrhoids. Similarly, Sachin and Murugandathan<sup>19</sup> reported that 47% (combined of both groups) patients had grade 3 haemorrhoids, and 53% had grade 4 haemorrhoids. No major postoperative complications were reported in our study. At the end of the procedure the total circumference doughnut of the stapler line was 92%. In open group Urine retention, bleeding, and pain were more common. In the open group two patients reported incontinence with flatulence and faeces. There are no reports of incontinence in the Stapled group. Compared to the stapled group intraoperative bleeding was more in open group reported by Aggarwal et al.<sup>9</sup> More pain in

the immediate postoperative period was reported in the open group. Tjandra<sup>30</sup> did a systematic review, with many short term haemorrhoidectomy is safe, and the long-term results are identical to conventional procedure. A report by .Laughlan et al.<sup>27</sup> states that stapled haemorrhoidectomy is associated with reduced post-operative pain and less bleeding but an increased rate of recurrent prolapse.

According to the guidelines of the French Anaesthesia Society postoperative pain was managed in this study. using a visual analog scale (VAS), pain was assessed. Based on the VAS score, analgesics were administered. In the open group at 6 hours, 12 hours, 24 hours and first defecation the pain scores were high significantly. Similar findings was reported by Tjandra et al.<sup>30</sup>, Laughlan et al.<sup>27</sup>, Rowsell et al.<sup>5</sup>Stolfi et al.<sup>26</sup> observed that on the first two postoperative days postoperative pain was similar. Significantly more pain was reported by Cheethamet al.<sup>35</sup> in the stapled group.<sup>19</sup> A low staple line was probably the cause of the pain. The pain scores of patients on post op day 1 at 6 hrs, 12 hrs, 24 hrs, 1st motion, 1st week and 10 days was demonstrated by Kumar et al.<sup>17</sup>Significantly lesser pain was observed in the present study.

In this study, the mean duration of hospital stay (in days) in the stapled group and the open group was  $1.96 \pm 0.82$  and  $3.98 \pm 0.78$  days respectively. A significantly shorter hospital stay was observed in the stapled group. The findings of shorter hospital stay in patients undergoing stapled haemorrhoidectomy as reported by Tandra et al.<sup>30</sup>, Laughlan et al.<sup>27</sup>, and Khan et al.<sup>28</sup> each supported by our study. Kumar et al.<sup>17</sup> did a study that states the hospital stay was significantly lower. The staple group took short time compared to the open group. Similar findings was

also reported by studies of Hetzer et al<sup>29</sup>, Khan et al<sup>28</sup>, Mehigan et al.<sup>4</sup> and Rowsell et al.<sup>5</sup> Kumar et al.<sup>17</sup> reported that Stapled group (p=0.000) returned to work significantly earlier, which is consistent with the present study. In the stapled group the average time to return noted by Shukla et al.<sup>20</sup> was 10 days as against 20 days in the conventional group.

The first papers on long-term outcomes of stapled haemorrhoidectomy came out in 2007 and in a review of 12 randomized trials by Shiva, it was found that stapled haemorrhoidectomy had a higher recurrence rate than the open method.<sup>35</sup> However, no statistical difference in the outcomes and recurrent rates was found in another multicentric long-term study comparing two groups, which concluded that fourth-degree haemorrhoids operated by stapled haemorrhoidectomy, are prone for recurrences. The study also found recurrences not only in the staple but also in open group, but the study could not find any statistical correlation. Partial mucosal resection owing to procedural error or a true recurrence is the likely justifications, the persistence of large prolapsed haemorrhoids that cannot be assimilated in the stapler. Staple procedure are found to be expensive as compare to the open by many studies.<sup>9,37</sup> But they also argue that, in terms of hospital stay and duration to normal activities, the short-term benefits that the stapled procedure offers, may equalize the cost factors, in the long run. In conclusion it is conform by this study that in terms of intra operative and immediate postoperative complications, with an early return to activities of daily living, stapled haemorrhoidectomy is better than open haemorrhoidectomy.

### Limitation of the Study

Due to having a small sample sized prospective

comparative hospital-based study, this findings may not accurately reflect the situation of the entire country.

### Conclusion

The study affirms that stapled haemorrhoidectomy is associated with shorter duration of surgery, less postoperative pain, less requirement for analgesia, shorter duration of hospital stays and a quicker recovery as well as earlier return to work as compared with Milligan - Morgan open haemorrhoidectomy. During the six-month follow-up period, there are no significant post-operative complications such as recurrence, residual prolapse, or incontinence. Hence it concludes that stapled haemorrhoidectomy is safe with many short-term benefits. It is going to be a novel technique and an alternative to open haemorrhoidectomy.

### Recommendation

This study can serve as a pilot to a much larger research involving multiple centers that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

**Funding:** No funding sources.

**Conflict of interest:** None declared.

**Author's Contributions:** All data are collected by Dr. Md. Emdadul Hassan, Dr. Md. Abdul Jalil, Dr. Md. Omar Faruk all of whom helped to interpret the data. The manuscript was prepared by Dr. Khadijatul Kobra also by Dr. Md. Abdul Jalil. All are supervised by Professor Dr. M Mohibul Aziz.

The decision to submit the article for publication are carried out by Md. Abdul Jalil.

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