

Comparison of Two Surgical Modalities Stapler Hemorrhoidectomy and Open Hemorrhoidectomy: A Hospital Based Prospective Study

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Abstract

Background: Hemorrhoids can be treated using a variety of surgical and non-surgical techniques. Among these, hemorrhoidectomy is thought to be the disease's cure. There are numerous methods to do it. Many surgeons accept the conventional open technique. A recent development in the treatment of hemorrhoids is the stapler hemorrhoidectomy. The purpose of this study is to examine the technical, functional, and financial aspects of the two surgical procedures used to treat hemorrhoids: open hemorrhoidectomy and stapled hemorrhoidectomy.

Methods: From April 2022 to September 2022, 80 patients who had hemorrhoid surgery at the Department of Surgery at Narayan Medical College and Hospital in Sasaram, Bihar, participated in this hospital-based prospective comparative study after providing written informed consent.

Results: The frequency of postoperative anal stenosis, return to normal activity, and postoperative bleeding did not differ statistically significantly between the two groups. Hospital stays for stapled hemorrhoidectomy patients range from 1 to 6 days (median 2 days), while those for open hemorrhoidectomy patients range from 1 to 3 days (median 1 day). The significant p value was less than 0.001.

Conclusion: Because stapler hemorrhoidectomy is associated with less postoperative problems, particularly pain and bleeding, early bowel movements, early hospital discharge, and an early return to regular activities, it has a better clinical outcome than open hemorrhoidectomy. More clinical research with long-term follow-up is required to ascertain the incidence of recurrence following stapler hemorrhoidectomy.

Keywords: Post-Operative, Complication, Open Haemorrhoidectomy, Stapled Haemorrhoidectomy.

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Introduction

Internal hemorrhoids arise as a result of pathological alterations in the anus's vascular tissue cushion. These cushions assist the internal sphincter close the anal

canal completely, maintaining anal continence. The symptoms of hemorrhoids can be either symptomatic or asymptomatic and include bleeding,

mucous discharge, itching, pain, and anything coming out of the rectum. 4–34% of people have hemorrhoids. Increased abdominal pressure, portal hypertension, straining during defecation, connective tissue anomalies, and tissue metaplasia are among hypothesized causes of hemorrhoids.[1]

Hemorrhoids are graded differently depending on whether they prolapse. Hemorrhoids of the first and second degrees can be treated conservatively or with band ligation and sclerotherapy. For hemorrhoids of the third and fourth degrees, surgery is necessary. Because the anal mucosa is delicate, patients undergoing open hemorrhoidectomy experience pain when the hemorrhoid is removed together with the anal mucosa and perianal skin. Additionally, patients must take care of their hygiene, particularly with regard to fecal contamination, and finish washing and dressing their wounds. Wound healing may take longer if an infection develops.

A painless substitute is stapler hemorrhoidectomy, also referred to as stapler rectal mucosectomy [2]. By cutting off the hemorrhoid's blood supply, this technique minimizes the hemorrhoid's size and the amount of accessible rectal mucosa, which lessens the prolapse of the rectal mucosa.[3]

In this study, postoperative pain, hospital stay, and early return to work with or without problems for second- and third-grade hemorrhoids are compared between stapler and open hemorrhoidectomy.

Methods

From April 2022 to September 2022, 80 patients who had hemorrhoid surgery at the Department of Surgery at Narayan Medical College and Hospital in Sasaram, Bihar, participated in this hospital-based prospective comparative study after

providing written informed consent. Only elective cases and late 2nd degree and 3rd degree haemorrhoids patients are included in the study.

Patients with proximal lesion like malignancy, coagulation disorder and bleeding diathesis, inter-current anorectal disease like fistula, fissure etc, prior haemorrhoidectomy or any perineal surgeries, and liver cirrhosis, HIV, uncontrolled diabetes, or on anticoagulant medication are excluded from the study.

MS Excel was used to generate the data, while IBM SPSS software version 20 was used for statistical analysis. While mean and standard deviation were used to convey continuous data, frequency and percentage were used to express categorical data. The independent t-test for continuous variables and the chi square test for categorical variables were used to compare the two groups. A p value of less than 0.05 was considered significant.

Outcome measures were complications; local swelling: visible swelling/edema in the anal region; post-operative pain: VAS score at 1st day, 7th day, 14th day and 1 month; reactionary bleeding: spontaneous bleeding on the day of operation or 1st post op day; post-operative bleeding: spontaneous bleeding during sitz bath or while defecating during the hospital stay; pattern of first bowel movement; duration of hospital stay; and return to normal activities.

Results

The pain scale and VAS score have a range of 0 to 10. The open hemorrhoidectomy group's mean VAS score was 7.03 ± 1.098 , while the stapler hemorrhoidectomy group's was 2.54 ± 1.18 . The stapler hemorrhoidectomy group experienced much less discomfort than the open hemorrhoidectomy group ($p < 0.05$) (Table 1).

Table 1: Comparison of post-operative pain between the two surgical modalities (n=80)

Table 1: Comparison of post operative pain between the two surgical modalities (n= 80)					
Postoperative pain (VAS)		Surgical procedure			
		Open hemorrhoidectomy (n=30)		Stapler hemorrhoidectomy (n=50)	
		No. of cases	Percentage	No. of cases	Percentage
Mild pain	1-3	0	0.0	42	84.0%
Moderate pain	4-7	19	63.3%	8	16.0%
Severe pain	8-10	11	36.7%	0	0.0
Mean±SD		7.03±1.098		2.54±1.18	
Chi-square Test		69.943			
P value		0.001			

Four percent of the stapler hemorrhoidectomy group's patients and none of the open hemorrhoidectomy group's cases had reactionary bleeding.

Nevertheless, there was no statistically significant difference in reactive bleeding between the two groups ($p>0.05$) (Table 2).

Table 2: Comparison of reactionary bleeding between two groups

Reactionary bleeding	Surgical procedure			
	Open hemorrhoidectomy (n=30)		Stapler hemorrhoidectomy (n=50)	
	No. of cases	Percentage	No. of cases	Percentage
Absent	30	100.0%	48	96.0%
Present	0	0.0	2	4.0%
Chi-square Test	1.231			
P value	0.267			

The open and stapled hemorrhoidectomy groups had mean hospital stays of 3.57 ± 0.73 and 2.06 ± 0.77 days, respectively. Compared to patients who received stapler hemorrhoidectomy, those who underwent open hemorrhoidectomy had significantly longer hospital stays (>3 days) (43.3% versus 6%; $p<0.05$) (Table 3).

Table 3: Comparison of length of hospital stay between two groups

Length of hospital stay (days)	Surgical procedure			
	Open hemorrhoidectomy (n=30)		Stapler hemorrhoidectomy (n=50)	
	No. of cases	Percentage	No. of cases	Percentage
≤3	17	56.7%	47	94.0%
>3	13	43.3%	3	6.0%
Mean±SD	3.57±0.73		2.06±0.77	
Chi-square Test	16.333			
P value	0.001			

In the open hemorrhoidectomy group, the average time after surgery to resume regular activities was 3.03 ± 1.16 weeks, while in the stapler hemorrhoidectomy group, it was 1.82 ± 0.75 weeks. After a stapler hemorrhoidectomy, almost 88% of cases were able to resume their regular activities within two weeks, but patients in the open hemorrhoidectomy group needed much more time ($p<0.05$) to do so (Table 4).

Table 4: Comparison of time taken to return to normal activity

Return to normal activities (in weeks)	Surgical procedure			
	Open hemorrhoidectomy (n=30)		Stapler hemorrhoidectomy (n=50)	
	No. of cases	Percentage	No. of cases	Percentage
1	2	6.7%	17	34.0%
2	8	26.7%	27	54.0%
3	11	36.7%	4	8.0%
4	6	20.0%	2	4.0%
5	2	6.7%	0	0.0
6	1	3.3%	0	0.0
Mean±SD	3.03±1.16		1.82±0.75	
Chi-square Test	27.118			
P value	0.001			

In the open and stapled hemorrhoidectomy groups, the first bowel movement was recorded within a mean postoperative day of 2.30 ± 0.75 and 1.72 ± 0.57 , respectively. A statistically significant change ($p < 0.05$) was detected in the first bowel movement after the surgery (Table 5).

Table 5: Comparison of time taken from surgery to first bowel movement between two surgical groups

1 st bowel movement (POD)	Surgical procedure			
	Open hemorrhoidectomy (n=30)		Stapler hemorrhoidectomy (n=50)	
	No. of cases	Percentage	No. of cases	Percentage
1	3	10.0%	17	34.0%
2	17	56.7%	30	60.0%
3	8	26.7%	3	6.0%
4	2	6.7%	0	0.0
Mean±SD	2.30±0.75		1.72±0.57	
Chi-square Test	13.513			
P value	0.004			

Table 6 shows that compared to the stapler hemorrhoidectomy group, a significantly larger percentage of patients in the open hemorrhoidectomy group experienced pain and bleeding issues in the first and second weeks following follow-up ($p < 0.05$). Even though 3.3% and 10% of patients in the

open hemorrhoidectomy group experienced minor bleeding and pain at the one-month follow-up, the difference in complications was statistically insignificant ($p > 0.05$). At every follow-up, none of the patients in either group exhibited edema ($p > 0.05$).

Table 6: Comparison of complications between two groups at 1 week, 2 week and 1 month follow up

Complications			Surgical procedure					
			Open hemorrhoidectomy (n=30)		Stapler hemorrhoidectomy (n=50)		Chi-squir e test	P valu e
			No. of cases	Percenta ge	No. of cases	Percentag e		
Pain	1 week	No	16	53.3%	48	96.0%	25.39	0.001
		Mild	9	30.0%	2	4.0%		
		Moderate	5	16.7%	0	0.0		
		Mean	1.47±0.717		0.06±0.03			
	2 weeks	No	23	76.7%	50	100.0%	12.79	0.002
		Mild	7	23.3%	0	0.0		
		Mean	0.40±0.08		0			
	1 month	No	27	90.0%	50	100.0%	5.195	0.074
		Mild	2	10.0%	0	0.0		
		Mean	0.13±0.04		0			
Bleedin g	1 Week	Absent	24	80.0%	50	100.0%	10.81	0.001
		Present	6	20.0%	0	0.0		
	2 weeks	Absent	27	90.0%	50	100.0%	5.195	0.023
		Present	3	10.0%	0	0.0		
	1 month	Absent	29	96.7%	50	100.0%	1.688	0.194
		Present	1	3.3%	0	0.0		
Swellin g	1 Week	Absent	30	100.0%	50	100.0%	NA	NA
		Present	0	0.0	0	0.0		
	2 Weeks	Absent	30	100.0%	50	0.0	NA	NA
		Present	0	0.0	0	0.0		
	1 month	Absent	30	100.0%	50	100.0%	NA	NA
		Present	0	0.0	0	0.0		

Discussion

The majority of patients in the open hemorrhoidectomy group (46.7%) were between the ages of 41 and 50, while the majority of patients in the stapler hemorrhoidectomy group were between the ages of 51 and 60. Patients undergoing open hemorrhoidectomy and stapler hemorrhoidectomy had mean ages of 46.30±9.7 years and 50.06±11.6 years, respectively. In our study, the majority of patients were male (76.7% in the open hemorrhoidectomy group and 80% in the stapler group).[7] As a result, we found that hemorrhoids were more common in men. The ages and sexes of the two groups were similar ($p>0.05$). The age range of 41 to 50 accounted for the majority of

instances in both the open group (31%) and the stapler group (35.7%). According to Rahman et al., hemorrhoid patients were 39.05±5.29 years old on average.[4] Our research findings were supported by the fact that over half of the cases in both groups were male and that the two groups were similar in terms of age and sex. Our findings were supported by the findings of Salama et al., who found no significant variation in the age and sex makeup of the two groups ($p>0.05$).[8] They found that the average patient age in the stapler and open hemorrhoidectomy groups was 41.71±11.43 and 39.34±12.50 years, respectively, and that the majority of hemorrhoidectomy cases in both groups

were male (73.7% in the stapler group and 57.9% in the open group).

In our study, the VAS score was used to quantify post-operative pain as soon as possible (within a day) following surgery. The open hemorrhoidectomy group experienced considerably more pain and its severity following surgery (mean VAS 7.03 ± 1.098 ; 63.3% moderate discomfort) than the stapler hemorrhoidectomy group (mean VAS 2.54 ± 1.18 ; mild pain in most, i.e., 84% cases) ($p < 0.05$). At six hours (1.83 ± 0.72 versus 2.91 ± 0.89 ; $p = 0.001$), twelve hours (1.88 ± 0.63 versus 2.22 ± 0.84 ; $p = 0.043$), and twenty-four hours (1.51 ± 0.66 versus 1.90 ± 0.82 ; $p < 0.05$) after the procedure, the mean VAS scores of the stapler hemorrhoidectomy group were significantly lower than those of the open hemorrhoidectomy group. Furthermore, Salama et al.[10] found that the stapler group's mean (pain) VAS score was considerably lower than the open group's (1.82 ± 1.14 versus 4.89 ± 1.59 ; $p < 0.01$). According to a research by Kumar et al.[5], the open hemorrhoidectomy group performed better than the stapler hemorrhoidectomy group in terms of mean VAS score (5.19 ± 0.41 versus 1.92 ± 0.23), however the difference was not statistically significant ($p > 0.05$). The mean VAS scores of the open hemorrhoidectomy group were significantly higher than those of the stapler hemorrhoidectomy group at 6 hours (2.89 ± 0.86 versus 1.78 ± 0.77 ; $p < 0.001$), 12 hours (2.13 ± 0.82 versus 1.82 ± 0.61 ; $p = 0.047$), and 24 hours (1.89 ± 0.80 versus 1.42 ± 0.62 ; $p = 0.003$).[7] In the current study, none of the patients in the open hemorrhoidectomy group experienced reactive bleeding, whereas 4% of the stapler hemorrhoidectomy group did. However, it was shown that the incidence of reactive bleeding did not differ statistically significantly between the two groups ($p > 0.05$). According to a research by Sachin et al., postoperative bleeding happened in 14% of cases in the stapler

group and 22% of patients in the open hemorrhoidectomy group; however, the difference was not statistically significant.[7]

With a mean hospital stay of 3.57 ± 0.73 days as opposed to 2.06 ± 0.77 days in the stapler hemorrhoidectomy group, a lengthier hospital stay was significantly linked to open hemorrhoidectomy.[11] While 94% of patients in the stapler hemorrhoidectomy group were released from the hospital within three days following the treatment, approximately 43.3% of cases in the open hemorrhoidectomy group required more than three days of hospitalization ($p < 0.05$). Salama et al. reported similar results, noting that the open hemorrhoidectomy group's mean hospital stay was considerably longer than the stapler hemorrhoidectomy group's (1.20 ± 0.43 versus 0.93 ± 0.44 days; $p = 0.10$).[6] This study's results were consistent with those of Rahman et al., who found that the stapler group's mean hospital stay was much lower (1.42.94 days) than the open hemorrhoidectomy group's (3.32.9 days).[4] The majority of patients (78.6%) in the stapler group had LOHS of less than two days, whereas the majority of cases (73.8%) in the open hemorrhoidectomy group had LOHS of two to four days ($p < 0.05$).

Patients who underwent stapler hemorrhoidectomy were found to resume their normal activities significantly earlier than those who underwent open hemorrhoidectomy; 88% of the stapler hemorrhoidectomy group did so within two weeks of surgery, compared to 33.5% of the open hemorrhoidectomy group ($p < 0.05$). It took an average of 3.03 ± 1 . [12] weeks for the open hemorrhoidectomy group and 1.82 ± 0.75 weeks for the stapler hemorrhoidectomy group to resume their regular activities. According to Kumar et al., the open hemorrhoidectomy group took 14 ± 3.4 days to return to normal activities, but the stapler group took 4 ± 1.2

days ($p=0.0423$). These results were consistent with that study's conclusions. Salama et al. found that people who received stapler hemorrhoidectomy returned to their normal activities 2.24 ± 1.08 days earlier than those who had open hemorrhoidectomy (3.39 ± 1.28 days). The results of the current study were consistent with those of Rahman et al., who reported a noticeably quicker recovery in terms of resuming their regular activities. It took an average of 13.1 ± 7.1 days for the stapled group and 22.08 ± 9.5 days for the open group to resume regular activities. After two weeks, a significantly higher proportion of patients ($>90\%$) in the stapler group resumed their usual activities than 33.3% in the open group ($p<0.05$).

Only 66.7% of patients in the open hemorrhoidectomy group experienced their first bowel movement during the first two postoperative days, compared to roughly 34% and 60% of patients in the stapler hemorrhoidectomy group on postoperative days 1 and 2, respectively. The difference was statistically significant ($p<0.05$).

The open and stapled hemorrhoidectomy groups took an average of 2.30 ± 0.75 and 1.72 ± 0.57 days, respectively, to return to their normal activities. Thejaswi et al.[9] found that the stapler group took 18.37 ± 6.31 hours to pass their first stool, while the open group took 37.23 ± 5.88 hours ($p<0.05$). The average time for the first stool to pass following a stapler hemorrhoidectomy was 20 hours, while the average time for an open hemorrhoidectomy was 24.9 hours.[10]

The VAS score was used in our study to quantify postoperative pain one week, two weeks, and one month following surgery. At one and two weeks of follow-up, the open hemorrhoidectomy group experienced considerably more discomfort and its severity than the stapler hemorrhoidectomy group ($p<0.05$).

The findings of the current study were supported by the findings of Rahman et al., who reported discomfort in significantly higher proportions of patients who had open hemorrhoidectomy (57.1%) compared to the stapler hemorrhoidectomy group (31%); ($p<0.05$) postoperatively. Kumar et al. reported discomfort in 36.7% , 23.3% , and 3.3% of patients following open hemorrhoidectomy, compared to 13.3% , 10% , and none following stapler hemorrhoidectomy after one week, one month, and three months. The results of our analysis were supported by Sachin et al. findings, which showed that discomfort was a complication in 56% of open hemorrhoidectomy patients compared to 30% of stapler hemorrhoidectomy cases, and that the difference was statistically significant ($p<0.05$).[12] We found that 20% and 10% of patients in the open hemorrhoidectomy group experienced postoperative bleeding at one or two weeks, whereas none of the patients in the stapler hemorrhoidectomy group did. The difference was statistically significant ($p<0.05$). At the one-month follow-up, the open hemorrhoidectomy group experienced one bleeding incidence (3.3%), and there was no statistically significant difference in bleeding between the two study groups ($p>0.05$).[13] Although the difference was considered statistically insignificant, postoperative bleeding was found in a higher proportion of patients in the open hemorrhoidectomy group (21.4%) than in the stapler hemorrhoidectomy group (14.3%) in a study by Rahman et al.[4] Sachin et al. also discovered that the incidence of bleeding was higher in the open hemorrhoidectomy group (22%) than in the stapler hemorrhoidectomy group (14%).[7] However, the difference was not statistically significant ($p>0.05$).

Conclusion

According to the study, stapler hemorrhoidectomy is better than open hemorrhoidectomy for the treatment of

grade II to IV hemorrhoids in terms of clinical outcome because it is linked to fewer postoperative complications, including pain and bleeding, early bowel movements, early hospital discharge, and an early return to normal activities. Stapler hemorrhoidectomy may therefore be the first choice for treating grade II to IV hemorrhoids. More clinical research with long-term follow-up is required to ascertain the incidence of recurrence following stapler hemorrhoidectomy.

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