

A Comparative Study of Surgical Treatment of Hemorrhoids: Stapled vs Open and Closed Hemorrhoidectomy

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ABSTRACT

Hemorrhoids and piles are used interchangeably very often but originally the words have entirely different meanings. Surgical treatment of hemorrhoids has been suggested for third- and fourth-grade hemorrhoidal disease and include removal of hemorrhoidal tissue. Stapled hemorrhoidectomy [minimally invasive procedure for hemorrhoid (MIPH)] introduction received much enthusiasm as it offers patients a significantly improved postoperative comfort level. The aim of this study is to make comparative assessment of following procedures for hemorrhoids: Stapled hemorrhoidectomy, open hemorrhoidectomy, closed hemorrhoidectomy, in terms of operative time, hospital stay, postoperative complications, and cost-effectiveness.

Keywords: Comparative study, Hemorrhoids, Stapler.

How to cite this article: Bhati T, Sharma BK. A Comparative Study of Surgical Treatment of Hemorrhoids: Stapled vs Open and Closed Hemorrhoidectomy. *J Mahatma Gandhi Univ Med Sci Tech* 2017;2(3):109-113.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Hemorrhoids and piles are used interchangeably very often but originally the words have entirely different meanings. The hemorrhoid's definition is difficult to state as pathophysiology of this condition is still not clearly defined. At least 50% of the people over the age of 50 have some degree of hemorrhoid formation.¹ Surgical treatment of hemorrhoids has been suggested for third- and fourth-grade hemorrhoidal disease and includes removal of hemorrhoidal tissue. Most frequently used procedures are Milligan-Morgan open hemorrhoidectomy and Ferguson closed hemorrhoidectomy techniques. In 1993, Longo Milton stapled hemorrhoidectomy technique was

introduced as substitute to conventional techniques for operative management of hemorrhoidal disease. It was recount and refined by Longo in 1998.² Stapled hemorrhoidectomy introduction received much enthusiasm as it offers patients a significantly improved postoperative comfort level, which is ascribable to the fact that the mucosal incision and staple lines are placed well above the dentate line and the highly sensitive perianal skin is left intact.

The aim of this study is to make comparative assessment of following procedures for hemorrhoids: Stapled hemorrhoidectomy, open hemorrhoidectomy, closed hemorrhoidectomy, in terms of operative time, hospital stay, postoperative complications, and cost-effectiveness.

MATERIALS AND METHODS

The study was conducted on cases operated in the Department of General Surgery at Mahatma Gandhi Medical College and Hospital, Jaipur, Rajasthan, India. Sixty cases of grades II, III, and IV piles (based on proctoscopy findings)¹ were studied (20 for open hemorrhoidectomy, 20 for closed hemorrhoidectomy, and 20 for stapled hemorrhoidopexy) from November 2015 to November 2017. The criteria for selection are as follows.

Inclusion Criteria

Sixty cases of grades II, III, and IV piles (based on proctoscopic findings) were studied.

Exclusion Criteria

- Patient with fissure and fistula
- Patient with full-thickness rectal prolapsed with piles
- Anal incontinence
- Rectocele
- Patients with anal stenosis

Due approval was taken from Institutional Ethical Committee before undertaking the study. The selected patients were then informed about the procedure and written informed consent was taken.

The following investigations were done: Hemogram, BT (Bleeding Time), computed tomography, erythrocyte sedimentation rate, RBS, renal function test, serum

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electrolyte, liver function test, human immunodeficiency virus, surface antigen of the hepatitis B virus, X-ray chest along with P/R and proctoscopy. After getting patient thoroughly investigated, hemorrhoidectomy (open, closed, and stapler for 20 cases each) was performed.

RESULTS

In our study most common symptom was prolapse of hemorrhoid followed by bleeding per rectum. Other symptoms include pain and constipation.

In MIPH, almost no peroperative bleeding occurred in 90% of cases compared with 60% in open and closed hemorrhoidectomy cases. Mild bleeding was noticed in 5% of cases in MIPH.

Average duration of surgery in MIPH was 16.8 minutes compared with 33.3 minutes in open and 40.4 minutes in closed hemorrhoidectomy group.

Only 10% cases operated by MIPH required multiple analgesic dose postoperatively compared with 70% in closed and 60% in open hemorrhoidectomy and is highly significant (p-value = 0.0002).

About 90% of patients were discharged from hospital within 2 days in MIPH, whereas only 15% in open hemorrhoidectomy cases and 40% in closed group were discharged within 2 days.

DISCUSSION

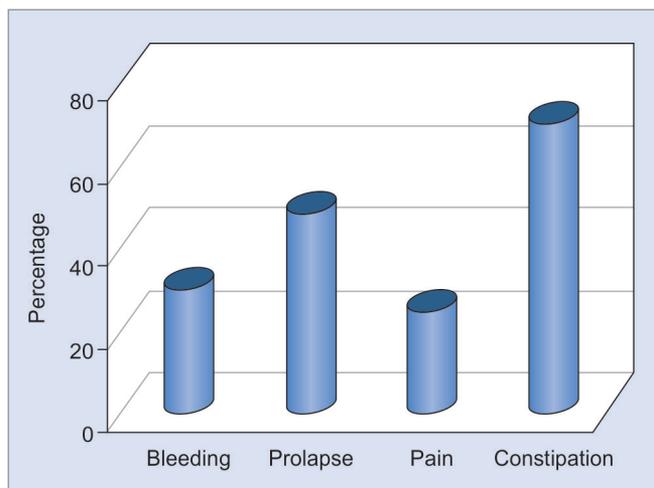
Our study was a prospective comparative study and included 60 patients admitted in Department of General Surgery, Mahatma Gandhi Medical College & Hospital, Jaipur, India, from year 2015 to 2017. In our study 20 cases were treated by MIPH, 20 cases by Milligan Morgan, and 20 by Fergusson technique and comparative assessment of all three procedures for hemorrhoids were done in terms of operative time, hospital stay, postoperative complications, and cost-effectiveness.

All the patients who were included in the study had complaint of bleeding per rectum which was present in 30% of cases (Table 1 and Graph 1).

Similar high incidence has been noted in studies of Clark et al³ (18%) and Hood and Williams⁴ (25% of cases).

Table 1: Presenting symptoms

Preoperative symptoms	No. of patients	Percentage
Bleeding per rectum	18	30
Prolapse	29	48.3
Pain	15	25
Constipation	42	70



Graph 1: Distribution of preoperative symptoms

In our study, 48% of patients complained of prolapse of hemorrhoids (Table 1). Similar high incidence has also been observed in studies of Clark et al⁵ (56%), Hood and Williams (85%), Lloyd Williams et al⁴ (80% of cases).

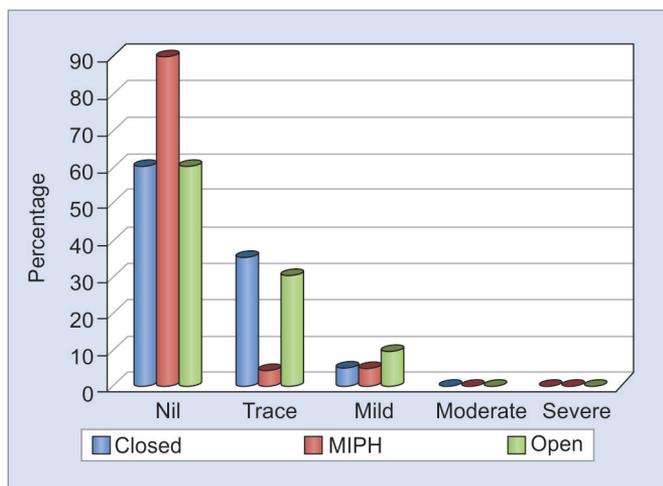
In our study, 25% of patients complained of pain during defecation (Table 1). Incidence of similar complaint was noted by others in Dencker series, 41% in Kaufman series, and 60% in Hood series.^{4,6,7}

In our series, 90% of patients had nil bleeding peroperatively, 5% had trace, and 5% had mild bleeding in MIPH cases. There were no cases reported to have severe bleeding in MIPH procedure. In conventional procedures, 60% of patients had no bleeding and 35% (in closed) and 30% (in open) had trace bleeding, whereas 10% cases (in open) and 5% cases (in closed) had mild grade of bleeding (Table 2 and Graph 2).

In a study conducted by Hetzer et al,⁸ incomplete excision of mucosal ring, improperly used technique, suture

Table 2: Peroperative bleeding

Peroperative bleeding	Closed hemorrhoidectomy		Minimally invasive procedure for hemorrhoid (Stapler)		Open hemorrhoidectomy	
	No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
Nil	12	60.0	18	90.0	12	60.0
Trace	7	35.0	1	5.0	6	30.0
Mild	1	5.0	1	5.0	2	10.0
Moderate	0	0.0	0	0.0	0	0.0
Severe	0	0.0	0	0.0	0	0.0



Graph 2: Peroperative bleeding

line dehiscence, or mucosal tear during anal dilatation are supposed to play role in causing peroperative bleeding. There was no case reported to have moderate or severe bleeding peroperatively.

In a study conducted by Mehigan et al,⁹ 12% cases had mild bleeding; 14% in series of Roswell et al¹⁰ and Kaufman.¹¹

In our series, average duration of staple operation was 16.8 minutes compared with 33.3 minutes in open and 40.4 minutes in closed hemorrhoidectomy procedure and is found to be highly significant (p-value < 0.05) (Table 3 and Graph 3).

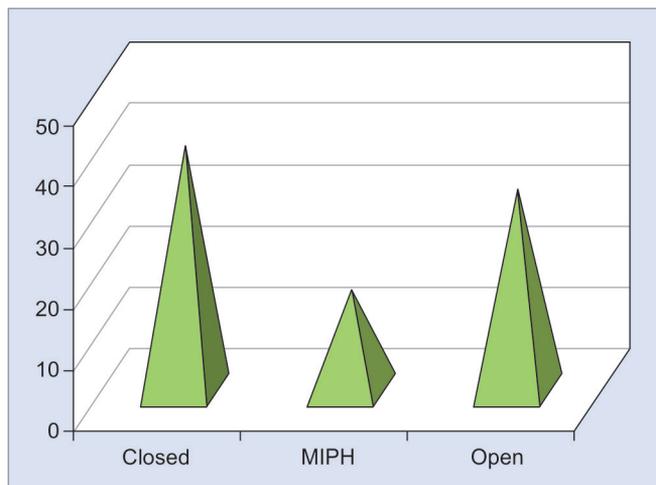
Mehigan et al⁹ reported 18 minutes average duration for staple technique. It was found 30 vs 43.25 minutes in Hetzer et al⁸ study report (Table 4).

In our study, patient operated by MIPH, 90% of them required single dose of analgesics, only 10% of them required multiple analgesics dose. Whereas in open, this ratio was 40:60 (single:multiple analgesic dose) and in closed, of 30:70. This signifies postoperative pain is less in MIPH procedure compared with open and closed hemorrhoidectomy techniques and on comparison it was highly significant (p-value < 0.05) (Table 5 and Graph 4).

Study conducted by Kirsch et al¹³ stated complain of moderate pain for a median of 5.3 (0–19) days in conventional hemorrhoidectomy compared with 3.1 (0–10) days in staple hemorrhoidectomy. Monson¹⁴ observed in his study of 25 patients undergoing staple hemorrhoidectomy that they had less overall pain than those undergoing the conventional procedure. In our

Table 3: Duration of operation

Average duration of operation	Mean	Standard deviation	Range (minutes)	p-value
Closed	40.4 min	3.9	32–46	0.0000
MIPH	16.8 min	2.4	12–20	
Open	33.3 min	6.3	21–45	



Graph 3: Mean duration of operation

Table 4: Comparison of operative time

Study	MIPH	Conventional hemorrhoidectomy (open and closed)
Mehigan et al ⁹	18 min	22 min
Shalaby and Desoky ¹⁶	9 min	19.7 min
Mortensen (2002)	18 min	22 min
Hetzer et al ⁸	30 min	43 min

series, 10% of patients operated by staple technique had postoperative bleeding. In conventional procedure, this rate was 30% in closed and 45% in open hemorrhoidectomy (Table 6 and Graph 5).

In series of Ganio et al,¹⁵ postoperative bleeding was 3% in staple hemorrhoidectomy. In our series, 20% of patients of stapled group complained of retention of urine, 35% of closed group, and 25% of open group had similar complaint (Table 6).

In a study of 200 patients, by Shalaby and Desoky,¹⁶ 7 patients of stapled group complained of acute urinary retention as early postoperative complication.

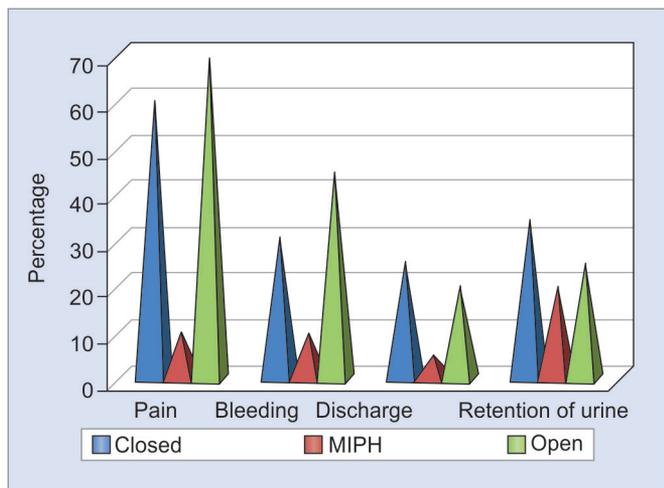
In our study, 5% of patients of stapled group had complained of discharge. This rate was 4% in the study of Shalaby and Desoky¹⁶ series (Table 6). In addition, 90%

Table 5: Postoperative pain

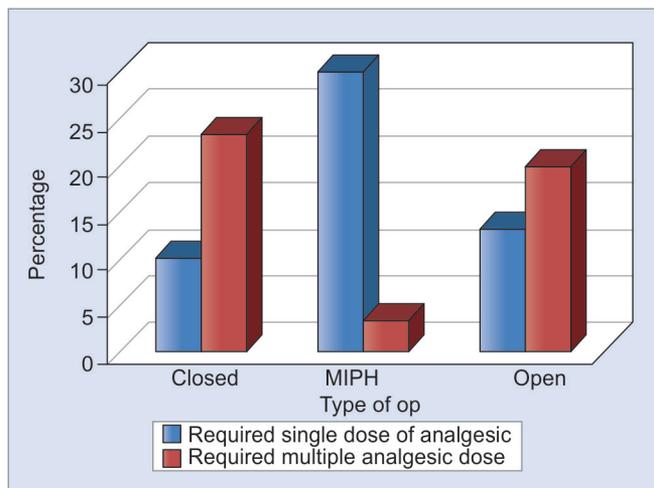
Postoperative pain	Closed hemorrhoidectomy		MIPH		Open hemorrhoidectomy		p-value
	No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage	
Required single dose of analgesic	6	30.0	18	90.0	8	40.0	0.0002
Required multiple analgesic dose	14	70.0	2	10.0	12	60.0	
Total	20	100.0	20	100.0	20	100.0	

Table 6: Postoperative complications

Postoperative complications	Closed hemorrhoidectomy		MIPH		Open hemorrhoidectomy	
	No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
Pain	12	60.0	2	10.0	14	70.0
Bleeding	6	30.0	2	10.0	9	45.0
Discharge	5	25.0	1	5.0	4	20.0
Retention of urine	7	35.0	4	20.0	5	25.0



Graph 4: Postoperative complaints



Graph 5: Postoperative pain

Table 7: Postoperative hospital stay

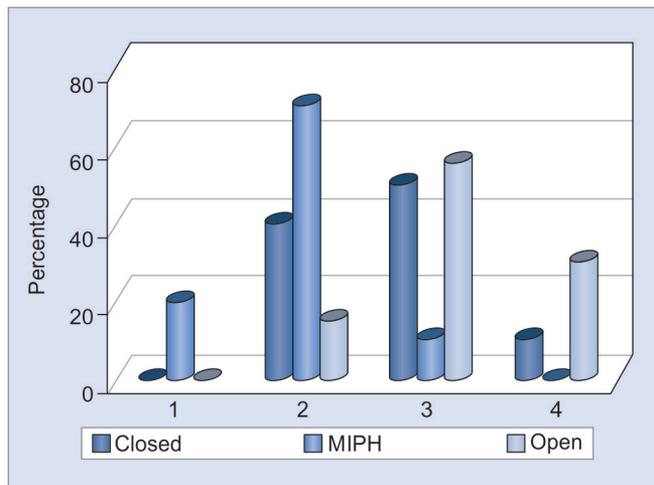
Duration of hospital stay (days)	Type of operation					
	Closed		MIPH		Open	
	No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
0-1	0	0	4	20.0	0	0
1-2	8	40.0	14	70.0	3	15.0
2-3	10	50.0	2	10.0	11	55.0
>3	2	10.0	0	0	6	30.0
Total	20	100.0	20	100.0	20	100.0

		n	Mean	Std. deviation	p-value
Mean hospital stay	MIPH	20	1.900	0.5525	0.000
	Open	20	3.150	0.6708	
	Closed	20	2.700	0.6569	
	Total	60	2.583	0.8087	

patients of stapled group were discharged from hospital till postoperative day 2, remaining 10% were discharged the next day, i.e., postoperative day 3. However, in conventional group, it was 70% on third postoperative day and 30% on fourth postoperative day (in open group) and 90% on third postoperative day and 10% on fourth postoperative day (in closed group) (Table 7 and Graph 6).

Roswell et al¹⁰ randomly assigned 22 patients to staple and conventional hemorrhoidectomy and mean hospital stay was lower in staple group compared with conventional procedure 1.5 vs 2.5 days.

Ganio et al¹⁵ series stated lower mean hospital stay of 1 day in staple group compared with 2 days in conventional group.



Graph 6: Mean hospital stay (days)

SUMMARY AND CONCLUSION

This study has been undertaken to study the effectiveness of staple (MIPH) over open (Milligan-Morgan) and closed (Ferguson) hemorrhoidectomy procedures. Twenty cases of hemorrhoids in the study were operated by staple technique and kept postoperatively in the ward and followed at regular intervals postdischarge up to 3 months. Based on this study, following conclusion was made.

Minimally invasive procedure for hemorrhoid is simple and effective surgery, less time-consuming, best suitable for grade III and IV hemorrhoids; however, it requires lot of experience for the same. Though the stapler instrument is costly but due to less postoperative pain, early recovery, and less complications, it is becoming popular. No recurrence in stapled group during the follow-up period.

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