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Original Research Article

Comparative study of the outcome and early complications between stapled and open hemorrhoidectomy

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ABSTRACT

Background: Hemorrhoids also known as piles are vascular cushions in the anal canal that help with stool control. When these cushions are swollen or inflamed, they become a disease. The signs and symptoms depend on the type present. Internal hemorrhoids often result in painless, bright red rectal bleeding while defecating whereas external hemorrhoids mostly present with pain and swelling in the area of the anus.
Methods: This study was conducted in the department of surgery, GMC Jammu during the time period of one year. After seeking consent to be a part of study, patients were subject to either of the procedures based on their allotted groups and aim was to compare the outcome and early complications between stapled and open hemorrhoidectomy groups.
Results: A total of 90 patients were taken for the study and 45 patients were recruited to each group. VAS (visual analog scale) scores for pain were better in the stapled group. None of the stapled patients complained of bleeding beyond first post-op week. In the open group 1 patient continued to complain of bleeding during defaecation even at 45 days. The mean hospital stay was lower and return to work was earlier in stappled group as compared to open group. The incidence of postoperative fever, incontinence to flatus, urinary retention, mucus discharge, unhealed anal wound, anal stenosis and recurrence was more in the open group as compared to stappled group.
Conclusions: Our study affirms stapled hemorrhoidectomy as a superior procedure in terms of early outcomes, with lesser post-op pain and bleeding, early hospital discharge, early return to work, less complications and low recurrence rate as compared to open hemorrhoidectomy.

Keywords: Anal stenosis, Bleeding, Hemorrhoidectomy, Rectal, Stappled hemorrhoidectomy

INTRODUCTION

Hemorrhoids, or “piles”, is one of the most common anorectal disorders. Hemorrhoids develop when cushions of vascular tissue in the anus undergo pathological change. These cushions have an important role in maintaining continence because they function, along with the internal anal sphincter, to allow the complete closure of the anal canal. Hemorrhoids can be thought of as symptomatic aggregations of this subepithelial tissue that may cause bleeding, mucosal or faecal soiling, itching, and occasional pain.[1]

The key etiologic factors contributing to the development of hemorrhoids include constipation and prolonged straining. Increased intra-anal pressure leads to abnormal dilatation and engorgement of vascular channels, followed by chronic changes in the supporting connective tissue within the anal cushions. An inflammatory reaction and vascular hyperplasia may be evident in hemorrhoids. With time and aging, starting as early as the second or third decade of life, the tissue supporting hemorrhoids can deteriorate or weaken, leading to distal displacement of the cushions and venous distention, erosion, bleeding, thrombosis, and/or tissue prolapse.[2]

For practical purposes, internal hemorrhoids are further graded based on their appearance and degree of prolapse, known as Goligher's classification: (1) first-degree hemorrhoids (grade I): the anal cushions bleed but do not prolapse; (2) second-degree hemorrhoids (grade II): the anal cushions prolapse through the anus on straining but reduce spontaneously; (3) third-degree hemorrhoids (grade III): the anal cushions prolapse through the anus on straining or exertion and require manual replacement into the anal canal; and (4) fourth-degree hemorrhoids (grade IV): the prolapse stays out at all times and is irreducible. Acutely thrombosed, incarcerated internal hemorrhoids and incarcerated, thrombosed hemorrhoids involving circumferential rectal mucosal prolapse are also fourth-degree hemorrhoids.[3]

Current trends in management of hemorrhoids are: i) conservative management: grade 1 and 2; ii) sclerotherapy/banding: grade 1 and 2 hemorrhoids not responding to conservative measures; iii) hemorrhoidectomy: the indications for haemorrhoidectomy include: third- and fourth degree hemorrhoids, second-degree hemorrhoids that have not been cured by non-operative treatments, fibrosed hemorrhoids, interno-external hemorrhoids when the external haemorrhoid is well defined.

A number of options are available for the surgical treatment of hemorrhoids, including conventional hemorrhoidectomy, stapled hemorrhoidopexy (longo method, procedure for prolapsed hemorrhoids), Doppler-guided hemorrhoidal artery ligation, and LigaSure haemorrhoidectomy .

Conventional hemorrhoidectomy, the approach used most frequently, involves excision of the hemorrhoids using some version of the open (Milligan-Morgan) or closed (Ferguson) technique. In the open procedure, hemorrhoidal tissue is excised while preserving skin bridges to prevent stricture, and the wounds are allowed to heal by secondary intention. With the closed technique, the hemorrhoidal plexus is dissected from the internal sphincter, and the wound is closed with an absorbable suture. Both procedures involve an ano-dermal wound and are associated with significant pain, marked bleeding, and a prolonged period before return to normal activity.[4]

Proponents of haemorrhoidectomy with the use of circular staplers claim a reduction in postoperative pain and faster recovery as compared to conventional excision procedures.[5] Antonio Longo described stapled hemorrhoidectomy, referred to as the Longo technique or stapled hemorrhoidopexy. The operation aims to resect a circular layer of rectal mucosa above the hemorrhoids using a dedicated stapler (initially PPH 1, then PPH 3), reducing the blood flow to the hemorrhoidal plexus and lifting the hemorrhoids in anatomical position, resolving the prolapse. Nevertheless, stapled hemorrhoidopexy highlighted two key concepts on which many new surgical techniques for HD are based: avoiding skin excision, as one of the main contributors of postoperative pain, and directing the operation above the dentate line, recognizing the functional role of hemorrhoidal tissue.

Ligasure hemorrhoidectomy employs a novel electro thermal device to seal blood vessels through a combination of pressure and radiofrequency ablation. This has the effect of limiting the spread of thermal damage to within 2 mm of the adjacent tissue, and offers a substantial improvement over conventional diathermy.[4]

Among the newer surgical options which are currently available, haemorrhoidectomy performed by the Longo-Milito technique using circular anal stapler has shown promise. It has come up as a day-care procedure with minimal postoperative pain, lesser incidence of postoperative bleeding and early return to work.[7]

The current study was a prospective comparative study in Indian patients against this background.

Aims and objectives

Aim

To compare the outcome and early complications between stapled and open hemorrhoidectomy in tertiary care settings of GMCH-J.

Objectives

To compare between the outcomes in terms of VAS pain scores, time for return to work, mortality (if any). To compare between the early complications (pain, bleeding, incontinence, stenosis) of the procedures by follow-up to a period of 45 days.

METHODS

This prospective interventional comparative study was conducted in the department of surgery, Government Medical College Jammu during the time period from 1st August 2023 to 31 July 2024 after approval from members of ethical committee. The inclusion criteria included cases of grade 3 and 4 hemorrhoids admitted for surgery. The exclusion criteria included patients: not consenting to be part of study, having previous anorectal surgeries, cases of fecal incontinence, having concomitant anorectal disorder or chronic intestinal disease and pregnant females.

After seeking clearance from IEC, the study was conducted with following approach. A sample size of 90 patients was taken for the study. The distribution of the patients into two study groups was done by the treating doctor according to the set institutional protocol. The patients allotted to the study groups in such manner were followed up prospectively to study for outcomes and complications. The selection was non-random and non-blind, and the comparative study is descriptive. 45 patients were recruited into each arm of study over the period of

study. After seeking consent to be a part of study, patients were subject to either of the procedures based on their allotted groups.

Operative technique

In all cases, spinal anesthesia was used as the standard form of anesthesia. At the beginning of the surgery, all patients received 1 gram of ceftriaxone intravenously. Most patients received two enemas before surgery- one at night and another in the morning. We chose the lithotomy position to perform the operations for all patients.

Open hemorrhoidectomy

A Kelly clamp was placed over one hemorrhoidal pedicle. The external skin was incised in a V-shaped manner, followed by dissection of the hemorrhoidal plexus in a plane without any muscle injury using scissor and diathermy towards the clamped pedicle. A Vicryl 2/0 suture was used to ligate the pedicle that was cut at the end and left open to heal. The procedure was repeated for the remaining hemorrhoid pedicles. Gauze impregnated in local anesthetic cream and betadine was put into the anus as packing.

Stapled hemorrhoidectomy procedure

After anal dilatation and insertion of the anal ring and fixing it, we made a purse-string suture 2 cm above the dentate line using prolene 2/0 to include only mucosa and submucosa. Hemorrhoidal circular stapler (HCS) was then inserted, and the suture was tightened. Closure of the circular stapler was done and kept closed for 30 s then firing it and gentle withdrawal of the stapler, including the doughnut. Examination of the stapler line for any bleeding and controlling it. Gentle anal packing was done. The pack was removed after 18 hours.

Postoperative follow-up

Patients were discharged home after the removal of the anal pack and ensuring hemostasis. Daily antibiotics and oral analgesics were instructed; three-time sitz baths with disinfectant and then local healing cream was advised to be used. Oral laxative use was instructed for 2 weeks.

Patients were advised to avoid excessive movement for the first few days and not to worry if any minor bleeding happened.

A schedule of follow-up was given to patients as follows: every week for 4 weeks, then at 6 weeks. The aim of the later follow-up was to check for recurrence, bleeding, and stenosis and assess their satisfaction with the results. A return to work after the first postoperative week was advised.

Any postoperative complication was reported based on clinical findings, especially pain, bleeding, urine retention, recurrence, wound infection, and fecal incontinence.

To assess pain, we used a 10-cm linear analog pain scale starting from 0 (where there was no pain at all) to 10 (the worst pain ever experienced).

Complications were studied both by standard History and physical examination during hospital stay and on follow-up after a period of 1 week, 15 days and 45 days. Patients not following up in OPD were be questioned telephonically. Questionnaires and check lists were used to maintain consistency in history seeking and examination. Data thus obtained at the end of 1 year was statistically analysed to prove or to disprove the theoretical superiority of MIPH.

The major threat to this study was probability of high attrition due to low follow up rates, this has been covered by allowing for telephonic follow up for complications.

Statistical analysis

For descriptive statistics mean, standard deviation and percentages will be computed. The significant difference of the percentages between the two groups were tested using the chi square test. The significant difference in the mean values between the 2 groups were tested using the student's t independent test. For all the tests, level of significance was taken as 0.05.

RESULTS

45 patients were recruited to each group. In the stapled group 73.33% were males and 26.6% were females. On the other hand, in open group 71.1% were male and 28.8% females.

Table 1: Demographic and clinical data.

Clinical characteristic	Stapled group (%)	Open group (%)
Age (mean±SD)	45.26±14.17	46.82±16.19
Gender		
Female	12 (26.66)	13 (28.88)
Male	33 (73.33)	32 (71.11)
Hemorrhoid grade		
Grade 3	41 (91.11)	34 (75.5)
Grade 4	4 (8.88)	11 (24.5)

Age distribution

The mean age of patients in stapled group was 45.26 and in open group 46.82.

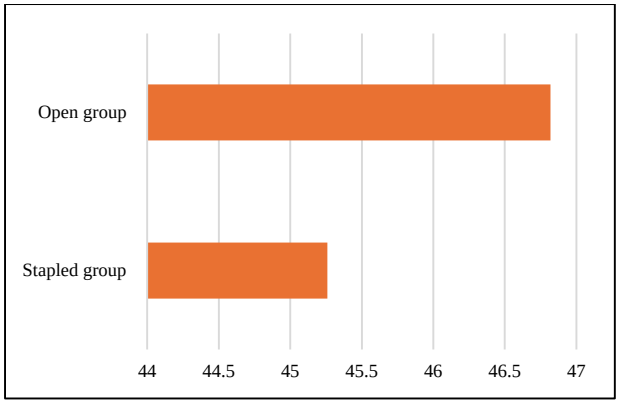

Figure 1: Age distribution.

Pre-operative hemorrhoid grade

In the stapled group 91.1% patients were subjected to surgery for grade 3 hemorrhoids and rest for grade 4. However, in open group 24.5% had grade 4 hemorrhoids and 75.5% had grade 3.

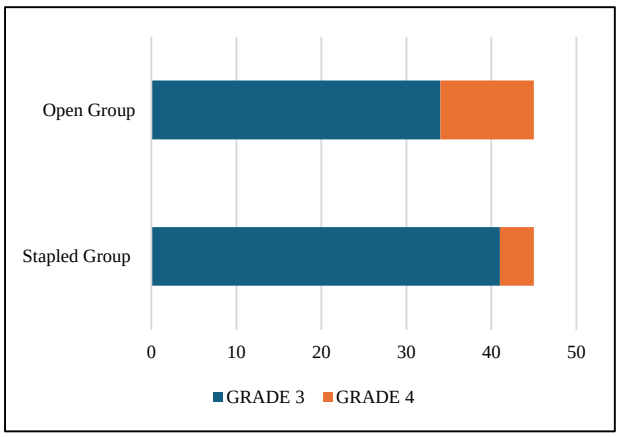

Figure 2: Preoperative hemorrhoid grade.

Post-op VAS pain score

VAS scores for pain were assessed on POD 1, 2 and 3 for each patient who had undergone either procedure. The results in Table 2 here represent the mean±SD of the VAS scores on each day in either group. The scores were constantly better by almost 2 points in the stapled group and were statistically significant on each day of study.

Table 2: Post-op VAS pain scores.

Post-op day	Stapled group (n=45) (mean±SD)	Open group (n=45) (mean±SD)	P value
1	5.82±0.91	7.6±1.01	0.007
2	4.55±0.86	6.17±0.88	<0.001
3	2.95±0.73	4.64±0.77	<0.0001

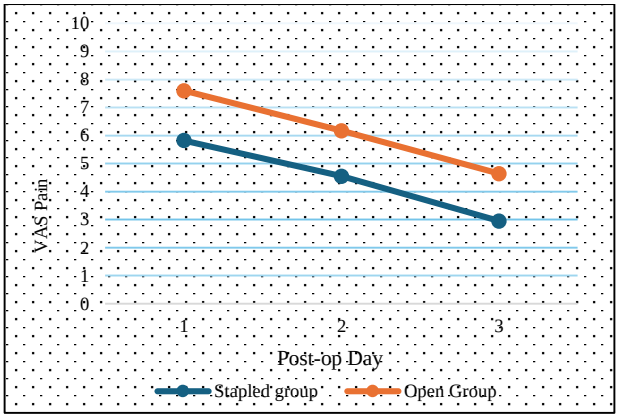

Figure 3: Post-op VAS pain scores.

Post-op bleeding

Patients were questioned for bleeding at first motion, on day 3, 1 week, 2 weeks and 45 days. At first motion 3 patients in stapled group complained of bleeding while 5 in open group complained the same. The number of patients complaining of bleeding reduced constantly in each group as depicted in Figure 4. None of the stapled patients complained of bleeding beyond first post-op week. In the open group 1 patient continued to complain of bleeding during defaecation even at 45 days. The percentage of patients having complaints of bleeding in each group are depicted in Table 3. The scores were better for stapled group on each day however the difference was not statistically significant on any group as the p vales were >0.05.

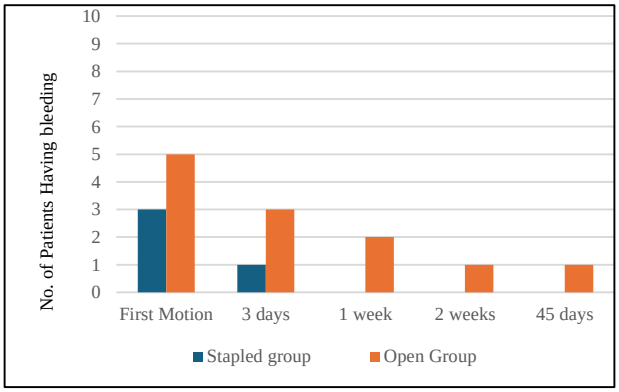

Figure 4: Post-op bleeding.

Hospital stay and resumption of work

As illustrated in Figure 5, in open group the mean hospital stay was 2.35 days, while mean return to work was 9.82 days. On the other hand, in stapled group the mean hospital stay was 1.88 days, while mean return to work was 6.06 days. The difference in the values was statistically significant for both hospital stay as well as return to work. The p value for hospital stay was 0.005 and for return to work <0.0001.

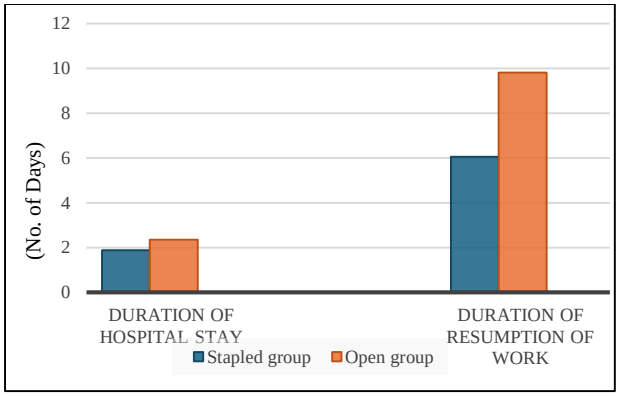

Figure 5: Duration of hospital stay and return to work.

Early post-operative complications

Fever

6.66% of stapled group patients had post operative fever while 11.1% of open group complained of same. The p value was 0.48 which was not statistically significant.

Partial anal incontinence

Incontinence to flatus was noted in a single patient of open group while as none in stapled group complained the same. The p value was 0.48 which was not statistically significant.

Urine retention

It was observed in 13.3% of stapled group and 15.5% of open group patients. P value was 0.007 thus statistically significant.

Mucus discharge

It was observed in 6.66% of stapled group and 8.8% of open group patients. P value was 0.71 thus statistically not significant.

Unhealed anal wound at 2 weeks

It was found in 8.8% of open group patients. None of the stapled group had an anal wound at 2 weeks. P value was 0.04 thus statistically significant.

Anal stenosis

It was found in 2.2% of open group patients. None of the stapled group had anal stenosis during follow up. P value was 0.48 thus statistically not significant.

Recurrence

4.5% in open group had early recurrence. None in the stapled group. P value was 0.16, thus statistically not significant.

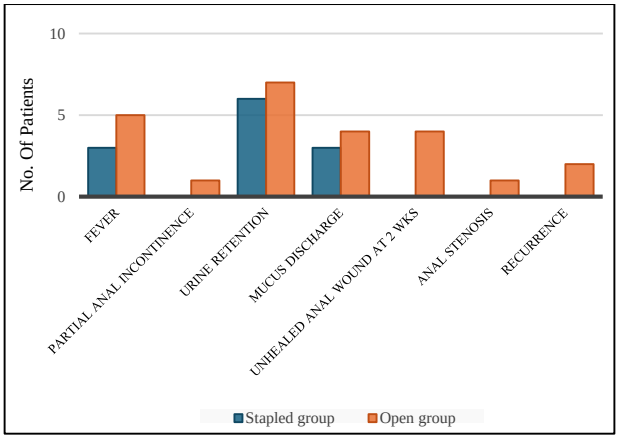

Figure 6: Early post-operative complications.

DISCUSSION

The theoretical superiority of stapled haemorrhoidectomy over open hemorrhoidectomy, backed by earlier studies, was subject to a prospective study in the evolving Indian surgical landscape. Observations asserting to it, reflected by the results of this study are subject to discussion in this section. In the present study, stapled hemorrhoidectomy resulted in about 2 fewer visual analog scores for post-operative discomfort than open hemorrhoidectomy on all days of study. The p scores on all days are less than 0.05 and thus statistically significant. Gravies et al reported that stapled hemorrhoidopexy causes significantly less postoperative pain.[8] Bhandari et al postulated that SH has better short-term outcome compared with open hemorrhoidectomy regarding postoperative pain, analgesic requirement.[9]

Kim et al and Daniel et al also noted similar results. Not surprisingly, the results of the present study substantiated the same with a statistically significant difference between the groups.[10,11] Since the procedure is completely above the dentate line, where there are no nerve endings, explains why there is less pain.

Hospital stay of patients in present study was significantly lower in stapled group than in open group. The findings closely mirror that of Surati et al and are better than those observed by Sachin and Muruganath et al.[12,13]

Similarly, the return to work was significantly earlier in the stapled group. Our patients returned to work earlier than reported by Sachin et al and Surati et al. The early return to work in stapled group is reflected across the spectrum of studies done, which is a consequence of decreased pain, absence of anal wound and decreased bleeding in the stapled group.[12,14]

Regarding postoperative anal bleeding, we found an incidence of 6.66% in the SH group and 11.1% in the open group at first motion. All bleeding was minor, with no need for any intervention, but it was just annoying patients. When we revise the literature and find an incidence of

bleeding to be 21.6% in patients in the stapled group and 13.6% in the open group Palimento et al and then find a systemic review by Tjandea that revealed reduced postoperative anal bleeding in the stapled group, it will lead us to believe that the individual abilities of the operating surgeon may be blamed for the large differential for this characteristic.[5]

Table 5: Comparative analysis of hospital stay and return to work.

Various studies	Hospital stay (days)		Return to normal routine activity (days)	
	Stapler hemorrhoidectomy	Open hemorrhoidectomy	Stapler hemorrhoidectomy	Open hemorrhoidectomy
Present study	1.88±1.48	2.35±0.57	6.06±1.13	9.82±1.91
Sachin and Muruganathan[13]	2	4	8	15
Singh et al[14]	1	3	2-7	7-13
Malyadri and Allu[7]	1	3	3	5
Surati et al[12]	1.5	2.4	3 (2-8)	20.5 (6-46)

In the present study, postoperative urine retention was 13.3% in the stapled group, whereas it was 15.5% for open hemorrhoidectomy. Spinal anesthesia and improper urine evacuation may be the causes. The reason may be because of incidentally higher prostatic disease in patients; their evaluation was beyond the scope of our study.

Anal incontinence for flatus was observed in a single patient of open hemorrhoidectomy (2.2%). Research by Khalil et al found findings that were similar to ours in that there was no record of anal incontinence in the group who underwent stapled hemorrhoidectomy.[15] Post op fever in our study was found in 6.66% in stapled group and 11.1% in open group. Most of these were secondary to angiocath induced thrombophlebitis and indwelling urinary catheters and as such higher incidence in open group can be attributed to their longer hospital stay.

Persistent mucus discharge was observed in 6.6% of stapled group and 8.8% of open group. Unhealed anal wound at 2 weeks which contributes majorly to morbidity was found in 8.8% of open group patients. The former was the continuation of the pre-operative symptoms in such patients and maybe an early indicator of a recurrence later and the latter was managed expectantly with baths. According to Shalaby and Desky, 2% of patients got anal stenosis after undergoing stapled hemorrhoidectomy. None of our patients in either group of individuals in the current research exhibited anal stenosis.[16]

Giordano et al cited the drawback of stapled haemorrhoidectomy in that it carries a significantly higher incidence of recurrence, and additional operations compared to open haemorrhoidectomy.[17] However, since we followed up only for early complications, we can neither assert nor negate such observations. We did not have any procedure related mortality.

CONCLUSION

Our study affirms stapled hemorrhoidectomy as a superior procedure in terms of early outcomes, with lesser post-op pain and bleeding, early hospital discharge and early return to work. Thus, the dread associated with early morbidity in conventional hemorrhoidectomy continues to faint down as more surgeons take up the stapled procedure as standard procedure. However, long-term reports of anal stenosis and recurrence and procedural dreads such as vaginal injuries and fistulas continue to deter this confidence. More studies from more diverse backgrounds and over longer periods of follow-up are needed to set the confidence of surgeons in concrete.

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