

Comparative Study of Minimal Invasive Procedure for Haemorrhoids vs Conventional Haemorrhoidectomy in Management of Haemorrhoids

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Abstract

Introduction: Till recently Milligan - Morgan haemorrhoidectomy i.e. conventional or open haemorrhoidectomy is the most popular surgical treatment for haemorrhoids. With the advent of minimal invasive surgery, the scenario has changed. More recently, stapler haemorrhoidectomy is becoming popular as a day care procedure with minimal post-operative pain and early return to work. **Aim:** The present study is designed to compare make a comparative assessment of the Stapled haemorrhoidectomy against Conventional haemorrhoidectomy in the surgical treatment of haemorrhoids. **Material and Methods:** A hospital based Non-randomised comparative study was conducted in Dept. of Surgery of at a tertiary care hospital. A total of 50 eligible cases scheduled for haemorrhoidectomy in our hospital were included in the study. These 50 patients were then divided into two groups i.e. 25 for stapled procedure and other 25 patients for conventional procedure. **Results:** Mean operative time was significantly less in stapler group (39.12 vs 45.75 mins; $p < 0.01$) while mean hospital stay was significantly longer in conventional surgery group (7.02 vs 3.01 days; $p < 0.01$). Post-op complain of pain, immediately after surgery (6 hrs.) and at day 1 and day 3 was significantly less in stapler group ($p < 0.01$). Post-op complications after conventional surgery include bleeding (28%), urinary retention (12%), wound infection, anal incontinence (8% each) and anal stenosis (4%). Complications of stapler surgery include bleeding

(16%) and urinary retention (4%). Mean time for return to work was significantly less in stapler group as compared to conventional surgery group (4.91 vs 13.8 days; $p < 0.01$). **Conclusion:** Stapler haemorrhoidectomy requires less operative time, reduces hospital stay and decreases post-operative pain. Return to normal activity is also significantly faster with stapler surgery.

Keywords: Conventional Haemorrhoidectomy; Haemorrhoids; Stapler Haemorrhoidectomy; Post-operative Pain; Return to Work.

Introduction

Haemorrhoids are one of the commonest ailment that afflicts mankind, and their treatment has been subject of consideration in medical literature since Egyptian papyruses earlier than 3000 BC. Hippocrates in 400 BC mentioned burning, strangling and excision [1]. The word 'haemorrhoid' is derived from the Greek adjective haemorrhoids, meaning bleeding (haima- blood, rhoos-flowing) which is most prominent symptom. The word 'piles' is derived from the Latin word pila-meaning a ball which refers to a swelling around the anus. These terms are often used synonymously.

It is difficult to obtain any accurate idea of their incidence, but rate of surgery for haemorrhoids vary form of their incidence, but rate of surgery hemorrhoids vary from 35/ 100,000 population/ year in UK to 50-60 /100,000 population / year in US [2] Prevalence in US population is 4.4% [3]. Many alternative treatment methods has been developed for haemorrhoids. Milligan-Morgan haemorrhoidectomy i.e. conventional or open haemorrhoidectomy was described in 1937, and is still the most popular surgical treatment for haemorrhoids. It has good result but is a very painful procedure resulting in increase hospital stay and having complications like immediate haemorrhage, urinary

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retention and late complication like incontinence, stenosis.

With the advent of minimal invasive surgery, the scenario has changed. More recently, Dr. Antonio Longo (1998) has advocated circular stapler haemorrhoidectomy for haemorrhoids [4]. This technique has been named "Procedure for Prolapse and Haemorrhoids (PPH)" and should be referred to as stapled haemorrhoidectomy. It has come up as a day care procedure with minimal post-operative pain and early return to work. Although it showed early promising results, expensive instrument, specialized training and a long learning curve limits the use of stapler haemorrhoidectomy. The present study is designed to compare make a comparative assessment of the Stapled haemorrhoidectomy against Conventional haemorrhoidectomy in the surgical treatment of haemorrhoids.

Materials and Methods

It is a Non-randomised comparative study done during period of October 2015 to September 2017 in Department of General Surgery, Dhiraj General Hospital, Pipariya, Vadodara. All eligible cases undergoing conventional haemorrhoidectomy and stapled haemorrhoidectomy in the Department of surgery, Dhiraj General Hospital, Pipariya, Vadodara during the study period.

Inclusion Criteria

Age more than 18 years with symptomatic hemorrhoids.

Exclusion Criteria

Asymptomatic haemorrhoids, thrombosed hemorrhoids, Hemorrhoids with fistula in ano and Other ano rectal pathology.

Sample size for stapled and conventional haemorrhoidectomy was 25 each (Total 50).

(*Sample design: Compare 2 Proportions: 2-Sample, 2-Sided Equality.* The institutional ethical committee clearance was taken before the study. All patients admitted at Dhiraj general Hospital with haemorrhoids explained about the cost factor. If the patient agrees, then only Patient was operated. A detailed history was taken and all patients were subjected to thorough clinical examination including per rectal and proctoscopic examination by which further hemorrhoids was graded. According to the grades of haemorrhoids 1st grade was excluded from the surgical treatment as they were not indicated. Routine lab investigations like blood and screening of chest were done. A total of 25 patients underwent stapled procedure and other 25 patients underwent conventional procedure according to the patients will

after explaining the procedure. The study group was analyzed post operatively on factors such as: Post-operative pain: assessed by visual analogue scale, Bleeding, Wound infections, Urinary retention, Anal incontinence and Anal stenosis. All patients were assessed during the first post-operative day, day of discharge, and at follow up visits in 1st and 3rd week post operatively. Data were statistically described in terms of mean (\pm SD), frequencies (number of cases) and percentages when appropriate. Data were tested first for normal distribution by Kolmogorov-Smirnov test. Comparison of quantitative variables between the study groups was done using Student t test for independent samples if normally distributed. Mann-Whitney U test was used for non-normally distributed quantitative data. For comparing categorical data, Chi square test was performed. Exact test was used instead when the expected frequency is less than 5. A probability value (p value) less than 0.05 was considered statistically significant. All statistical calculations were done using computer programs Microsoft Excel 2007 (Microsoft Corporation, NY, USA) and SPSS (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) version 21.

Results

Present study aimed to make a comparative assessment of the Stapled haemorrhoidectomy against Conventional haemorrhoidectomy in the surgical treatment of haemorrhoids. The study group included 25 subjects in each group.

Most common age group affected by Haemorrhoids was between 41-60 years of age with mean age of 48.9 years. No difference was observed between the study groups as per age ($p > 0.05$). Males are more commonly affected than females (56% vs 44%). No difference was observed between the study groups as per gender ($p > 0.05$). Most common presenting complaint in patients of haemorrhoids was bleeding (86%) followed by constipation (36%), something coming out of rectum (prolapse - 36%) and pain (18%). No difference was observed between the study groups as per presenting complaints ($p > 0.05$).

Associated co-morbidities included Anaemia (14%), diabetes (10%) and hypertension (14%). No difference was observed between the study groups as per associated co-morbidities ($p > 0.05$) (Table 1).

Out of the 50 study cases, 8% were of grade 2 haemorrhoids while remaining 56% and 36% had grade III and IV haemorrhoids. No difference was observed between the study groups as per grade of haemorrhoids ($p > 0.05$) (Table 2).

Mean operative time was significantly less in stapler group as compared to conventional surgery group (39.12 vs 45.75 mins; $p < 0.01$).

Table 1: Comparison of study groups in demographic distribution

Age Group	Group		Total
	Conventional	Stapler	
18-30	1 4.0%	2 8.0%	3 6.0%
31-40	2 8.0%	3 12.0%	5 10.0%
41-50	10 40.0%	10 40.0%	20 40.0%
51-60	6 24.0%	6 24.0%	12 24.0%
> 60	6 24.0%	4 16.0%	10 20.0%
Total	25 100.0%	25 100.0%	50 100.0%
p- value - 0.82			
Gender			
Female	10 40.0%	12 48.0%	22 44.0%
Male	15 60.0%	13 52.0%	28 56.0%
Total	25 100.0%	25 100.0%	50 100.0%
p- value - 0.77			
Presenting complaints			
Bleeding	23 92.0%	20 80.0%	43 86.0%
Pain	4 16.0%	5 20.0%	9 18.0%
Constipation	17 68.0%	19 76.0%	36 72.0%
Prolapse	8 32.0%	10 40.0%	18 36.0%
Associated Co-Morbidities			
Anemia	3 12.0%	4 16.0%	7 14.0%
DM	3 12.0%	2 8.0%	5 10.0%
HT	2 8.0%	5 20.0%	7 14.0%

Table 2: Comparison of study groups based on grade of haemorrhoids

Grade of Haemorrhoids	Group		Total
	Conventional	Stapler	
II	3 12.0%	1 4.0%	4 8.0%
III	14 56.0%	14 56.0%	28 56.0%
IV	8 32.0%	10 40.0%	18 36.0%
Total	25 100.0%	25 100.0%	50 100.0%
p- value - 0.54			

Mean hospital stay was significantly longer in conventional surgery group as compared to stapler group (7.02 vs 3.01 days; $p < 0.01$).

Post-op complain of pain (as measured by VAS score) immediately after surgery (6 hrs.) and at day 1 and day

3 was significantly less in stapler group as compared to conventional surgery group ($p < 0.01$) (Table 3).

No post-op analgesia was required in 60% cases of stapler group compared to none in conventional group. More than one dose of analgesic was required in 44%

Table 3: Variables in comparison with groups

Variables	Group	N	Mean	SD	p-value
Operative Time (mins)	Conventional	25	45.75	6.73	<0.01
	Stapler	25	39.12	3.82	
Hospital stay (days)	Conventional	25	7.02	1.90	<0.01
	Stapler	25	3.01	1.10	
Vas Scores Immediate (6 hours)	Conventional	25	5.70	1.26	<0.01
	Stapler	25	2.15	0.93	
Day 1	Conventional	25	4.60	1.09	< 0.01
	Stapler	25	1.80	1.03	
Day 3	Conventional	25	3.21	1.19	< 0.01

Table 4: Comparison of study groups based on post-op analgesia

Post-op Parenteral Analgesics	Group		Total
	Conventional	Stapler	
None	0 0.0%	15 60.0%	15 30.0%
1	14 56.0%	7 28.0%	21 42.0%
2	9 36.0%	3 12.0%	12 24.0%
3	2 8.0%	0 0.0%	2 4.0%
Total	25 100.0%	25 100.0%	50 100.0%

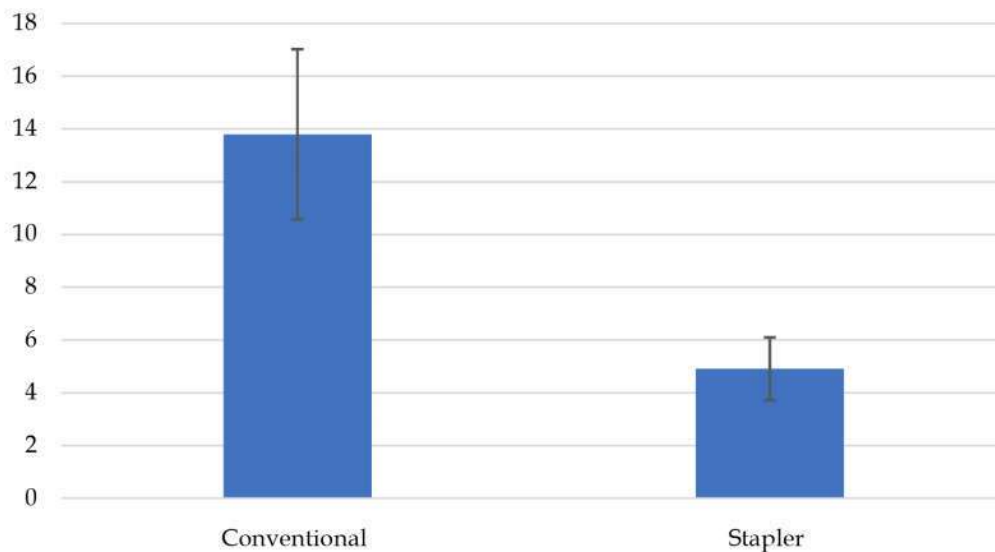


Fig. 1: Graph showing time for return to normal work

cases of conventional surgery compared to 12% cases of stapler group ($p < 0.01$) (Table 4).

Post-op complications after conventional surgery include bleeding (28%), urinary retention (12%), wound infection, anal incontinence (8% each) and anal stenosis (4%). Complications of stapler surgery include

bleeding (16%) and urinary retention (4%). No significant difference was noted between the two groups with respect to complications ($p > 0.05$) (Table 5). Mean time for return to work was significantly less in stapler group as compared to conventional surgery group (4.91 vs 13.8 days; $p < 0.01$) (Fig. 1).

Table 5: Comparison of study groups based on post-operative complications

Post-op Complications	Group			P- value
	Conventional	Stapler	Total	
Wound Infection	2 8.0%	0 0.0%	2 4.0%	0.49
Urinary Retention	3 12.0%	1 4.0%	4 8.0%	0.61
Anal Incontinence	2 8.0%	0 0.0%	2 4.0%	0.49
Anal Stenosis	1 4.0%	0 0.0%	1 2.0%	1.00
C/o Bleeding	7 28.0%	4 16.0%	11 22.0%	0.49

Discussion

Hemorrhoidectomy is the accepted method for the treatment of large symptomatic piles. Conventional hemorrhoidectomies are effective operations that have withstood the test of time; however, the problem of postoperative pain has never been satisfactorily addressed. The postoperative pain related to excisional hemorrhoidectomy is well known. Patients will frequently avoid definitive treatment of their disease for many years so as to avoid this very problem. Also, the high postoperative morbidity and long recovery has prompted the need for an alternative procedure. Several techniques, including diathermy haemorrhoidectomy, dilatation with banding and cryohaemorrhoidectomy have been tried. Stapled hemorrhoidopexy offers a significantly less painful alternative that provides patients definitive treatment of their disease in a single sitting [1].

A novel technique in dealing with the management of hemorrhoidal disease, it has emerged as an alternative to open hemorrhoidectomy, long considered the "gold standard". It treats the mucosal prolapse, with concurrent disruption of the blood supply to the hemorrhoidal tissue. The technique has been standardized and the indications, contraindications, and operative technique have been defined. Several randomized trials have shown the efficacy and safety of the procedure. There has been some concern and reluctance in accepting stapled hemorrhoidopexy as few serious complications have been reported. These include persistent postoperative pain, fecal urgency, recto-vaginal fistula, rectal obstruction, perforation peritonitis and pelvic sepsis. These have all been seen by most investigators in the early part of the learning curve. Numerous controlled studies have later demonstrated that this technique is associated with less postoperative pain and a quicker recovery. To further validate these findings in our set up, present study was designed to compare the short term results of stapled hemorrhoidopexy with conventional hemorrhoidectomy.

Age Comparision

Most common age group affected by Haemorrhoids was between 41-60 years of age with mean age of 48.9 years. Bikhchandani J et al. [5] mean age of patients was 46.02 years (SD, 12.33) in the stapled group and 48.64 years (14.57) in the open group. Shukla S et al. [6] most common age group for patients of haemorrhoids was 41-50 years. In the study by Thejeswi PL et al.[7], mean age was 45 years

Gender Comparision

Males are more commonly affected than females (56% vs 44%). Bikhchandani J et al. Hemorrhoids were more common in men (ie, 80.9% and 85.7% in the stapled and open group, respectively). Shukla S et al. [6] Males are more in number than females in both the study group. In the study by Thejeswi PL et al. [7], males are more commonly affected than females.

Presenting Complain Comparision

Most common presenting complaint in patients of haemorrhoids was bleeding (86%) followed by constipation (72%), something coming out of rectum (prolapse – 36%) and pain (18%). In the study by Henry et al. [8], PR bleeding was the most common symptom and prolapse as second most common.

Thejeswi PL et al. [7] observed bleeding per rectum as the presenting complaint in the majority of the patients with 45 of the 50 patients presenting with it; 26 patients gave complaints of a mass per anus and 10 patients complained of pain during defecation; 13 patients gave other associated symptoms such as constipation (9) and generalised weakness (3).

The most common problem reported by the patients before the operation in the study by Gravie et al. [9] was the impression of a mass at the anus (90%). Other problems included frequent bleeding (47%), itching (35%), constipation (31%), and pain (15%).

Grade of Hemorrhoids

Out of the 50 study cases, 8% were of grade 2 haemorrhoids while remaining 56% and 36% had grade III and IV haemorrhoids. No difference was observed between the study groups as per grade of haemorrhoids (p>0.05). In most of the cases surgical intervention is required only for grade III or IV hemorrhoids. Grade I and II case were general managed medically. Six cases in our study with grade II hemorrhoids had associated sever bleeding and measures to control the symptoms medically had failed. The comparison of present study results with other studies is shown in table 6 below:

Table 6: Grade of hemorrhoids

Author	Grade II	Grade III	Grade IV
Bhandari et al. ⁵	0.0%	70.5%	29.5%
Shukla et al. ⁶	26.7%	73.3%	0.0%
Thejeswi et al. ⁷	44.0%	56.0%	
Present study	8.0%	56.0%	36.0%

Time Required for Surgery

In presents study, mean operative time was significantly less in stapler group as compared to conventional surgery group (39.12 vs 45.75 mins; p<0.01). Shukla S et al. [7] also observed similar results with mean duration of surgery for patients’ having conventional haemorrhoidectomy as 44±5 minutes while patients having stapler haemorrhoidopexy as 39.75±5.73 minutes (p<0.01). Thejeswi PL et al. [7] observed average time taken for a stapled haemorrhoidopexy as 45.75 minutes (30-70min.) while conventional haemorrhoidectomy took an average of 62 minutes (45-80 mins). Bikhchandani et al. [6] observed the mean operative time to be shorter in the stapled group 24.28 minutes (4.25) versus 45.21 minutes (5.36) in the Milligan-Morgan group (p < .001). Gravie et al. [9] also observed Stapled hemorrhoidopexy to be significantly faster than the Milligan-Morgan technique (21 minutes versus 31 minutes; p <0.001). Metanalysis from china performed by Shao WJ et al., and Tjandra JJ et al., from university of Melbourne also found shorter operating time in stapler group than conventional one [10,11].

Post-Operative Pain & Analgesic Requirement

Post-op complain of pain (as measured by VAS score) immediately after surgery (6 hrs.) and at day 1 and day 3 was significantly less in stapler group as compared

to conventional surgery group (p<0.01). No post-op analgesia was required in 60% cases of stapler group compared to none in conventional group. More than one dose of analgesic was required in 44% cases of conventional surgery compared to 12% cases of stapler group (p<0.01). Bikhchandani et al. [5] in their study also observed that pain scores and requirement of analgesics to be significantly less in the stapled group. Gravie JF et al. [9] finds that the patients in the Stapler haemorrhoidopexy group experienced less postoperative pain during bowel movement and had less total analgesics requirement over the first 3 days. Thejeswi et al. [9] observed the average pain scores on post-op day 1, day 2 and day 3 in the stapled group as 3.8, 2.4 and 1.6 as against 5.4, 4.3 and 3.9 in the conventional group, respectively (p<0.01).

Senagore AJ et al. [11], Boccasanta [13] and Shao WJ et al. [11] meta-analysis showed that stapled haemorrhoidopexy was less painful than conventional haemorrhoidectomy with less post-op analgesic requirement.

Hospital Stay

Mean hospital stay was significantly longer in conventional surgery group as compared to stapler group (7.02 vs 3.01 days; p<0.01). Bikhchandani et al. [5] observed mean hospital stay as 1.24 days (0.62) and 2.76 days (1.01) (p < .001) in the stapled and open group, respectively. Thejeswi et al. ⁷observed the average duration of stay in the hospital for the stapled group as 1.5 days, with 13 patients being discharged within 24 hrs of the surgery. The average duration of stay in the hospital for conventional group was 6.2 days (p<0.01). Shukla S et al. [6] observed the mean duration of hospital stay in conventional group as 6.16±2.135 days while in stapler group as 3.25±1.932 days (p<0.01). Gravie et al.[9]observed similar results with mean length of stay varying from 1.00 to 3.50 days in the Stapler group and from 1.67 to 5.00 days in the conventional group.

Complications

No significant difference was observed in the incidence of complications in the 2 groups (p>0.05). Post-op complications after conventional surgery includes bleeding (28%), urinary retention (12%), wound infection, anal incontinence (8% each) and anal stenosis (4%). Complications of stapler surgery includes bleeding (16%) and urinary retention (4%).

Table 7: Post OP complication comparision

Author	Present Study		Gravie et al. ⁹		Bhandari et al. ⁵	
	Stapler	Conventional	Stapler	Conventional	Stapler	Conventional
Wound Infections	0.0%	8.0%	0.0%	0.0%	9.1%	18.2%
Urinary Retention	4.0%	12.0%	1.9%	5.2%	9.1%	13.6%
Anal Incontinence	0.0%	8.0%	11.5%	8.8%	0.0%	4.5%
Anal Stenosis	0.0%	4.0%	0.0%	1.8%	4.5%	0.0%
Post-op Bleeding	16.0%	28.0%	18.0%	23.0%	0.0%	4.5%

Shukla et al. [6] also observed bleeding as the most common symptom present in the post-operative period. At the end of 1st month, only 20% of patients with stapler procedure comes with complains of bleeding while it was present in 30% of conventional group patients. Urinary retention and wound infection was seen in 2 patients each in conventional group.

Bickchandani et al. [5] Shalaby et al. [14] and Gravie et al. [9] also found no difference in the rate of complications in the open and stapler groups respectively.

Time to Return for Work: Mean time for return to work was significantly less in stapler group as compared to conventional surgery group (4.91 vs 13.8 days; $p < 0.01$).

Table 8: Time to return for work comparison

Author	Time to return to work (Days)	
	Stapler	Conventional
Bikhchandani J et al. ⁵	8.12	17.62
Shalaby et al. ¹⁴	8.20	53.40
Shukla et al. ⁶	10.95	20.56
Gravie et al. ⁹	2.00	4.00
Ganio E et al. ¹⁵	1.00	2.00
Present study	4.91	13.80

Bikhchandani et al. [5] in their study observed that patients in the stapled group returned to work or routine activities earlier (ie, within 8.12 days [2.48]) as compared with 17.62 (5.59) in the conventional group ($p < 0.01$).

Shalaby et al. [14] observed the mean duration to return to routine work as 53.4 days and 8.2 days in conventional and stapler group respectively ($p < 0.01$). Similarly Shukla et al. [6] observed average duration of return to work post operatively as 10.95 ± 4.81 days in patient of stapler haemorrhoidopexy as compared to patients of conventional haemorrhoidectomy, where it is 20.56 ± 10.16 days ($p < 0.001$). Gravie JF et al. [9] shown the less duration of hospital stay of 2 days in Stapler as compared from 4 days in conventional one while Ganio E et al. [15] found it to be 1 day in stapler and 2 days in conventional procedure. Meta analysis done by Chen JS et al. [16] from Taiwan and Mattana et al. [17] also shows that stapler procedure provides has lesser hospital stay and quicker return to work.

Conclusion

Stapler haemorrhoidectomy requires less operative time, reduces hospital stay and decreases post-operative pain. Return to normal activity is also significantly faster with stapler surgery. Stapler haemorrhoidectomy is thus recommended for all patients undergoing surgery of haemorrhoids. However, there is a need to conduct larger prospective double blind trials with longer period of follow-up to study rate of recurrence alongwith trials for cost effectiveness.

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