



Milligan-Morgan Haemorrhoidectomy Versus Stapled Haemorrhoidopexy: A Prospective Comparative Study

¹Dr. Jagmohan Mishra, ²Dr. Biplab Mishra, ³Dr. Afroza Firodous

¹Dr. Jagmohan Mishra, Professor, Department of General and Laparoscopic Surgery, S.C.B Medical College, Cuttack, Odisha, India.

²Dr. Biplab Mishra, Junior Resident-3, Department of General and Laparoscopic Surgery, S.C.B Medical College, Cuttack, Odisha, India.

³Dr. Afroza Firodous, Junior Resident-3, Department of General and Laparoscopic Surgery, S.C.B Medical College, Cuttack, Odisha, India.

Corresponding Author: Dr. Biplab Mishra, Department of General and Laparoscopic Surgery, S.C.B Medical College, Cuttack, Odisha, India

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background: Haemorrhoids being a common anorectal problem, characterized by bleeding from anal canal is known for its morbidity and complications. The treatment option depends on the type and severity of the symptoms, on the degree of prolapse and on the expertise of operator and equipment available.

Methods: A prospective study conducted on 30 patients diagnosed with grade 3,4 haemorrhoids attending Department of General Surgery, SCB medical college and hospital from AUGUST 2016 to JULY 2018. After routine investigations the patients were randomly allocated for one the two surgeries after taking an informed consent.

Results: Out of 30 patients 15 underwent stapler haemorrhoidopexy and rest underwent open haemorrhoidectomy. There was a significant difference ($p < 0.05$) between the two groups in terms of Intraoperative blood loss (63.33 ± 11.16 ml vs 148 ± 32.04 ml), Operative time (27.06 ± 5.26 min vs 52 ± 11.59 min), Hospital stay (1.2 ± 0.77 days vs 2.66 ± 1.17 days), post

operative pain and time to return work (3.6 ± 1.298 days vs 9.22 ± 2.67 days).

Conclusions: Stapler hemorrhoidopexy is superior to Milligan-Morgan haemorrhoidectomy in terms of Intraoperative blood loss, operating time, hospital stay, Time taken to return to work and patient's satisfaction and it is straightforward and easy to learn. Hence it is an alternative to open procedure.

Keywords: Milligan-Morgan Haemorrhoidectomy, Stapler Haemorrhoidopexy, Haemorrhoids, Surgical Procedure.

Introduction

Haemorrhoids, commonly called 'piles' are one of the commonest afflictions of mankind from times immemorial. It is said that 40 percent of population have symptoms of haemorrhoids at some time of their lives, a price possibly man has to pay following the evolution of his erect posture. The assumption of an erect posture was a prodigious accomplishment and man pays for his arrogance by the pain and humility that go with

haemorrhoids. Morgagni³ (1749) attributed the upright posture of man as the causative factor of haemorrhoids. The term “haemorrhoid” is derived from the Greek adjective “haimorrhoides”, meaning bleeding (haima= blood, rhoos= flowing), and emphasizes the most prominent symptom in the majority of cases. It was first used by Hippocrates⁴ in his treatise but it cannot be accurately applied to all the conditions diagnosed as haemorrhoids, for a number of them do not at any time give rise to bleeding. The word Pile is derived from “pila”, a ball. This term was first used by John Arden⁵ and can aptly be used for all forms of haemorrhoids or piles, for literally every such condition does produce a swelling of some kind, even though it may not be seen externally. Vascular cushions within the anal canal do not differ anatomically in normal individuals from those in symptomatic patients. It is therefore probably illogical to talk about the incidence of vascular cushions since they are ubiquitous. In both sexes, all races and all ages have anal cushions. If the cushions are omnipresent then it is only the existence of symptoms that merits classification as a disease. Hundred percent of population has haemorrhoids but only about fifty percent are symptomatic⁶. The treatment of haemorrhoids dates back to antiquity for the two chief symptoms of bleeding and protrusion, the methods of treatment date back to the Babylonian era, Hippocrates described the treatment by cauterization, which must have been extremely painful in the ‘pre-anaesthetic era’⁷. This has been mentioned in “Sushruta Samhita” of the ancient Indian medicine. At present a wide variety of treatment is available for haemorrhoidal disease, ranging from advice on diet and bowel habit, to a number of non-operative methods of mucosal fixation and widening of the anus, and a host of different techniques of excision of the internal anal vascular cushions and the external vascular channels. The

choice of method depends on the type and severity of the symptoms, on the degree of prolapse and on the expertise of the operator and equipments available. Conventional haemorrhoidectomy is a commonly performed operation for haemorrhoids, it has good results but is a very painful procedure resulting in a hospital stay for four to ten days and time off work for two to six weeks⁸. The patient also faces the complications of immediate hemorrhage, reactionary or secondary, urinary retention, and late complications like stenosis or incontinence. In search of a surgical technique to treat this common condition, stapler has been introduced for haemorrhoidectomy. Stapled haemorrhoidopexy has come up as a new and promising procedure causing minimal post-operative pain, early discharge and quick return to work.

Materials and methods

This study was conducted in the Department of General Surgery, SCB Medical College And Hospital, Cuttack, from August 2016 to July 2018 on patients attending the out patients department or emergency department of SCB Medical College And Hospital irrespective of their gender, background, socio-economic status. In all 30 patients included in the study - 15 underwent stapled and 15 underwent open haemorrhoidectomy. The patients were randomly allocated to one of the two surgeries after taking an informed consent. The advantages and disadvantages of both the procedures were explained to the patient,

Inclusion criteria: All patients of

1. Large grade II haemorrhoids
2. Grade III haemorrhoids
3. Grade IV haemorrhoids
4. Patients fit for anaesthesia. were included in the study.

Exclusion criteria

1. Patients having grade I haemorrhoids.
2. Any associated anal pathology like fistula, fissure.
3. Patient with bleeding diathesis.

4. Pregnant ladies.

To assess the general condition of the patient Hb, TLC, DC, urine routine, X-ray chest, blood urea, blood sugar and ECG was done. Following assessment the cases were randomly allocated to one of the two treatment groups.

During the surgery the following parameters were recorded.

1. Operative time.
2. Approximate blood loss during surgery (from the number of gauze pieces soaked with blood).

Operative procedure All patients were operated in lithotomy position under saddle anesthesia, in the operation theatre of SCB Medical college and Hospital.

Open haemorrhoidectomy: 1. The open technique, which is still widely practiced in the UK, is based on the procedure originally described by Milligan⁹ and associates in 1937, and is usually referred to as the Milligan-Morgan operation.

1. The skin covered component of each of the main piles is seized with artery forceps and retracted outwards.

2. The purple anal mucosal component of each pile is grasped in another artery forceps and drawn downwards and outwards. This maneuver prolapses the pile well out of the anus and brings into view the pink rectal mucosa at its upper pole.

3. The traction of the three haemorrhoids is maintained until pink rectal mucosa shows not only at the upper part of the piles but also on the mucosal folds running between the piles. This indicates that the piles have been drawn down to their maximum extent so that the ligatures can be applied at their upper poles rather than in the middle.

4. The operator then makes a V shaped incision in the anal and perianal skin. The limbs of the V cross the mucocutaneous junction but do not extend into the mucosa, the point of the V should lie 2.5-3 cm away from the anal verge.,

5. It is preferred to free the haemorrhoidal venous plexus further by dissecting it off the internal sphincter for a distance of 1.5-2.0 cm.

6. The apex of the pedicle is then transfixed with a 0/0 or 1/0 chromic catgut suture on a round-bodied needle. The isolated haemorrhoid is then excised with scissors a few millimeters below the apical ligature, while the transfixion suture remains clamped and left long for further inspection at the end of the operation.

7. The transfixion ligatures are then divided and the skin wounds are trimmed if they appear ragged, leaving three pear-shaped raw areas.

Stapled haemorrhoidopexy

PPH set (PPH01) consists of

1. 33 mm Ethicon End surgery circular Stapler (HCS33).
2. Circular Anal Dilator (CAD33).
3. Purse-string Suture Anoscope (PSA33).
4. Suture Threader (ST100).

1. The anal verge is held by three atraumatic forceps at the three points where the prolapse is smaller and the anoderm is slightly averted. The introduction of the CAD 33 causes the reduction of the prolapsed mucous membrane falls into the lumen of the CAD33..

2. The CAD 33 should be affixed to the perineal skin through the four windows of the CAD 33 with silk or linen stiches on a cutting needle, all remaining prolapsing tissues should be pushed back with a atraumatic forceps through the windows of the CAD33.

3. The purse string suture anoscope (PSA33) is now introduced through the CAD33. The suture is to be taken at least 4 cm above the dentate line, the distance to be increased in proportion to the degree of the prolapse.

4. The purse string is initiated at 3'O clock position. By rotating the PSA33, it will be possible to complete a purse-string both ends of the suture will be 3'O clock position.

5. The PSA is now introduced to visualize the 9 o'clock window and a second simple stitch with the same suture material is placed at 9 o'clock at the same level as the purse string stitch. This is to ensure equal pull down of mucosa into the hollow stapler housing along its entire circumference.

6. There should be approx. 3 bites in each quadrant of exposed mucosa. The anoscope is rotated clockwise to expose subsequent quadrants. The haemorrhoidal circular stapler (HCS 33) is opened to its maximum position. Its head is lubricated, introduced and positioned proximal to the purse string.

7. With the help of the suture threader (ST 100) both ends of the purse string suture are pulled through the 3 o'clock hole of the HCS33.)

8. Surgeon must ensure correct placement of the mucomucous suture over the anaorectal ring, at least 2 cm from the dentate line. The instrument is then tightened adequately by clockwise rotation till the orange indicator reaches as close as possible to the distal end of the green firing zone. It is then fired.

9. Keeping the HCS 33 in the closed position for 20 seconds before and after firing acts as a tamponade, which promotes hemostasis.

10. The stapler is opened completely by anticlockwise rotation of the dial, till it comes out of the anus.

11. After removal of the stapler, the anus should be packed with a gauze piece and light pressure should be applied at the anastomotic site.

12. Finally the staple line is examined using the PSA33, and additional stitches, if needed should be taken.

Post-operative care

Patient was allowed fully oral after 6 hrs of surgery. Then patient was on oral antibiotics. Then patient was advised as follows,

1. Sitz bath (at least thrice a day and after every motion).
2. Syrup Lactitol 3tsf HS for 1 week.

In the postoperative period the parameters recorded were -

3. analgesia required (injectable/oral, non-opioid/opioid)
4. Soakage of the pad with blood
5. Any episode of moderately severe bleeding per rectum
6. Episode of urinary retention
7. Visual analogue score at 24 hours
8. Patient satisfaction

Visual Analogue score¹⁰: The concept of Visual analogue score was explained to each patient in the pre-operative period with the maximum imaginable pain as pain 10 and least as 1. The patient was assessed for VAS at 24 hrs, 3 days, 7 days and 15 days. One each below up visit the patient was subject to visual analogue pain score. On the second and subsequent visit, a gentle digital rectal examination and proctoscopic evaluation was done. Level of patient satisfaction was assessed against a score of 10. A note on the number of days to return back to work was made. After the initial visits the patients were advised to follow up every 3 months upto 1 year to look for-

- Anal stenosis
- Recurrent haemorrhoids
- Anal skin tags or fibrosis
- Incontinence
- Level of satisfaction

The patients who were unable to come for follow up (due to any reason) were inquired telephonically.

Statistical Tests

Computerised analysis of the data was done with the help of SPSS SOFTWARE. Significance levels were determined by using averages, standard deviation, unpaired student test, Mann Whitney U test (for non-parametric skewed distribution) and Fischer exact test.

If P value < 0.01 or < 0.001, the difference is highly significant

If P value < 0.05, the difference is significant.

Results: A total of 30 patients were included in the study.

Group A: Those who underwent stapled haemorrhoidopexy(n₁=15)

Group B: Those who underwent open haemorrhoidectomy(n₂=15)

Table 1: Age Distribution in Study

Group A : stapled haemorrhoidectomy

Group B : open haemorrhoidectomy

	Group A	Group B
Range (yr)	26-78	26-74
Mean (yr) ± S.D	45.8 ± 14.56	52.33 ± 17.08

P value > 0.2694 i.e. > 0.05.

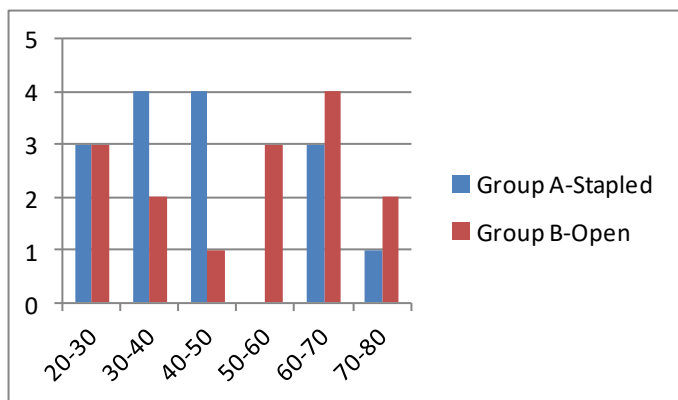


Figure 1: Age distribution of patients in study.

Table 2: Sex Distribution

	Group A	Group B
Males	12	13
Females	3	2

In the study 25 patients were males and 5 were females

Table 3: Presenting features

Symptoms	N (N=30)	%
Bleeding	25	83.33
Prolapse	15	100
Constipation	22	73.33
Itching	3	10

Patient usually had more than one symptom at the time of presentation.

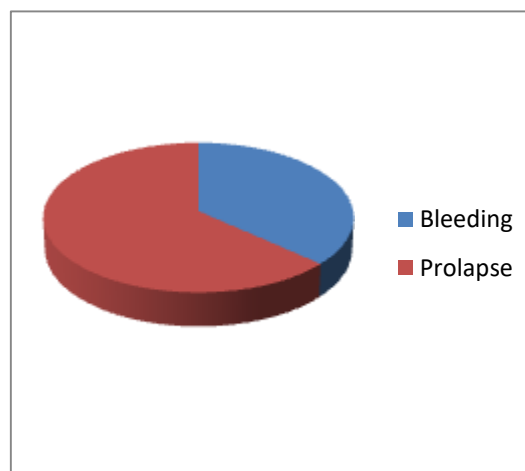


Figure 2: percentage of symptoms.

Table 4: Degree of Haemorrhoids in patients included in study

Grading	N (%)
Grade II	6(20%)
Grade III	23(76.66%)
Grade IV	1 (6.66%)

Table 5: Intra-Operative Blood loss

Group A: Stapled haemorrhoidopexy

Group B : open haemorrhoidectomy

Group	Mean (ml) ± S.D	Range (ml)
A	63.33 ± 11.16	50-80
B	148±32.04	80-200

This was calculated by estimating the number of gauze pieces soaked with blood and multiplying it by 10.

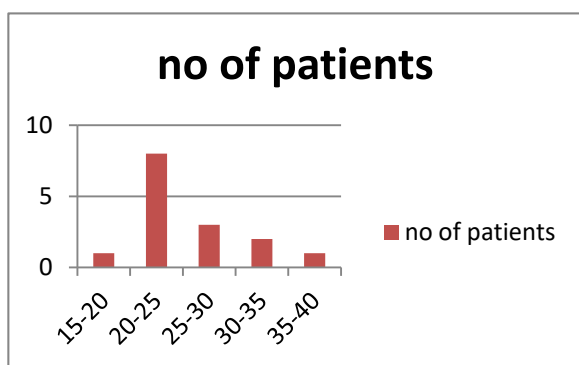
P value < 0.001. Hence the difference in blood loss between the two groups was highly significant.

Table 6: Operative Time

Group	Mean (min) ± S.D.	Range (min)
A	27.06±5.26	20-38
B	52±11.59	40-80

P value : < 0.001. Hence the difference in operative time between the two groups was statistically significant.

Group A (Stapler Haemorrhoidopexy)



Group B (open Haemorrhoidectomy)

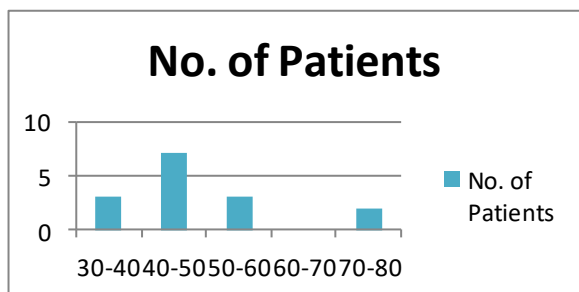


Figure 3: Operative time (mins)

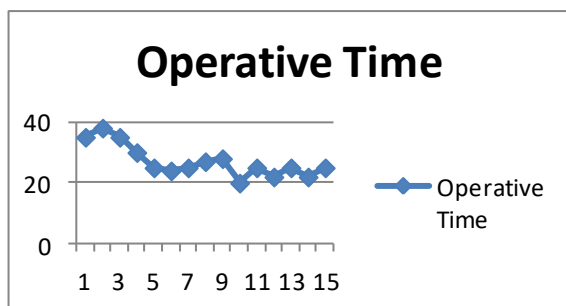


Figure 4: Operative time in stapled group (Learning Curve)

Table 7: Hospital stay*

Group	Mean (days) ± SD	Range (days)
A	1.2±0.77	1-4**
B	2.66±1.17	1-5

*The calculation of the hospital stay was made from the day of surgery and not from the day of admission thus excluding the duration for getting PAC fitness.

**Only one patient in group A had to stay in hospital for 3 days after surgery.

By Mann Whitney U test, P value is 0.000295 i.e. << 0.01 The difference in hospital stay between the two group was statistically significant.

Table 8 : Visual Analogue Scores

Group A : stapled haemorrhoidopexy

Group B : open haemorrhoidectomy

	Group A n ₁ + n ₂ + ...	Group B n ₁ + n ₂ + ...
Day 1	51	92
Day 3	8	59
Day 7	1	35
Day 15	0	23

By Mann Whitney U test

P value is

Day 1	0.000197
Day 3	0.000005
Day 7	0.000005
Day 15	0.000203

Hence the difference in pain between the two groups is significant even at 2 weeks post-operatively.

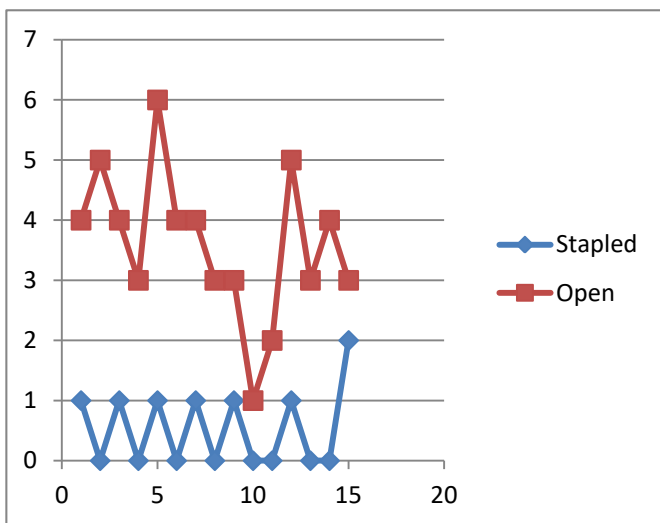


Figure 5: Assesment of visual analogue scores

Table 9: No. of patient working in each group before surgery

	n (N=15)	%
Group A	11	73.33
Group B	9	30

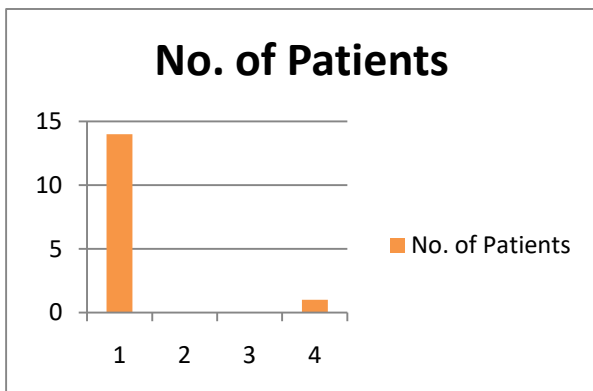
Table 10 : Days to return to work

Group	Mean (days) ± S.D	Range (days)
A	3.6 ± 1.298	2-7
B	9.22 ± 2.67	7-15

By Mann Whitney U test,

P value is 0.000003, hence the difference between the days to return to work in the two groups is highly significant.

Group A: Stapled



Group B : Open

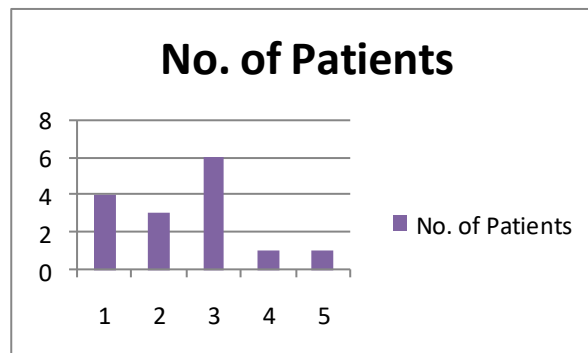


Figure 6 :Hospital Stay in days

Table 11: Complications

	Stapled		Open	
	n (N=15)	%	n (N=15)	%
Urinary retention	2	13.33	5	33.33
Hemorrhage	1	6.66	1	6.66
Incontinence	-	-	1	6.66
Increased frequency of defecation	1	6.66	-	-
Anal discharge	-	-	-	-

Table 12: Long Term Sequelae in follow up

	Stapled		Open	
	n (N=15)	%	n (N=15)	%
Haemorrhoids (recurrent)	-	-	-	-
Skin tags/fibrosis	-	-	3	20
Stenosis	-	-	-	-

Maximum follow up of 11 months

Mean follow up of 6.8 months

Table 13: Level of satisfaction – patients’ evaluation

	Highly Satisfied	Satisfied	Not satisfied
	n (%)	n (%)	n (%)
Stapled	10 (66.66)	4 (26.66)	1 (6.66)
Open	3 (20)	7 (46.66)	5 (33.33)

14 of 15 in group A i.e. 93.33% satisfied or highly satisfied

8 of 15 in group B i.e. 53.33% satisfied or highly satisfied

	Group A	Group B
Satisfied	14	8
not Satisfied	1	7



(b)



(c)



(d)

Figure 7: (a) –(e) steps of stapler haemorrhoidopexy



(a)

Discussion

Haemorrhoids are One of the most common benign anorectal surgical problems world wide¹. Goligher et al¹ reported that about 40% of haemorrhoid patients have to undergo haemorrhoidectomy at some time or the other. Rubber band ligation, Injection sclerotherapy, Infra-red coagulation and cryosurgery have also been used with some success but all have been shown to be inferior to surgery in the management of third and fourth degree haemorrhoids¹¹. The criticism directed at haemorrhoidectomy relate to the pain in the post-

operative period, to the necessity for the patient to be admitted in hospital for the operation, and to be absent from work for at least 2 to 3 weeks afterwards with a perineal wound which requires regular dressing¹².

Introduction of stapler for haemorrhoids has eliminated most of the above challenges¹³. It has also made the surgery for haemorrhoids more patient friendly¹⁴.

A total of 30 patients were part of the study excluding the patients who had grade I haemorrhoids or any associated anal pathology e.g. anal fissure or fistula. Mean age in group A was 45.8±14.56 years and in group B was 52.33±17.08 years (Table 1). There was no statistical difference in the mean age group between the two groups.

In the study conducted by Hetzer et al¹⁵, the mean age group was 50.4 yrs in stapled group and 44.8 yrs in open group with no statistical difference. Mean age group was 48 yrs and 47 yrs in the stapled and open groups respectively as evaluated by Ganio et al¹⁶, Ho and colleagues¹⁷ found the mean age group of 44 years in stapled haemorrhoidopexy patients and 46.3 years in open haemorrhoidectomy patients.

The condition of haemorrhoids was more common in males as compared to females (Table 2), Hetzer¹⁵ reported that the sex distribution of male: female was 15:5 in stapled group and 14:6 in open group in his study. This has also been pointed out in other studies in the literature^{10,17,18}.

Third degree haemorrhoids are the commonest haemorrhoids requiring surgical treatment as reported in various studies^{15,16,18,19,20}. In the present study 23 of 30 patients (76.66%) had grade III haemorrhoids (Table 6). However the condition of fourth degree haemorrhoids was more common in the study conducted by Shalaby et al¹⁰.

The most common complaint of the patients was bleeding (63.33%) (Figure 2). In the study Ortiz¹⁸ 89% of patients presented with bleeding. However Shalaby¹⁰ reported bleeding as a complaint in 65% of patients. Ho et al¹⁷ documented bleeding in 80% of patients.

The intra-operative blood loss²⁴ was significantly less in the stapled group as compared to the open group (mean 63.33±11.16 in group A and 148±32.04 in group B (p <0.001; highly significant) - Table 5.

There was a significant difference in the operative time in the two techniques. In group A mean operative time was 27.06±5.26 min as against 52±11.59 min in group B with a p-value of <0.001; significant - Table 6. It was seen that the duration of surgery showed a downward trend in the stapled group with the increase in the number of cases operated, probably because of the learning curve (Figure). The point of shorter operative time (statistically significant) has been well confirmed by a number of studies 10,15,19,20. However Ho et al^{17,25} found that the conventional haemorrhoidectomy required less time as compared to the stapled technique. This is probably because the study by Ho et al was conducted between 1999-2000, when the stapled haemorrhoidopexy was still in its earlier stages, learning curve being the contributing factor.

The duration of stay in the hospital was significantly less in group A (mean 1.2±0.77 days) as compared to group B (Mean 2.66±1.17 days) with p value of << 0.01 (Table 7). The hospital stay was shorter in stapled group in the studies conducted by Rowsell et al¹², Pavlidis et al²⁰, Ganio et al¹⁰ and Shalaby et al¹⁶: However the duration of stay was similar in the two groups as reported by Mehigan et al¹⁹, Hetzer et al¹⁵ and Ho et al¹⁷.

Visual Analogue Scores at 24 hours, day 3, day 7, day 15 was significantly low in group A as against group B, p

value of < 0.01 - Table 10. The requirement of analgesics during the hospital stay as well as after discharge was less in group A. The pain scores compared between the two groups in various studies conclusively prove that the post-operative pain is much less²³ after stapled haemorrhoidopexy than after open haemorrhoidectomy. All studies have been unanimous on this point.

The most common complication seen in the study was urinary retention. In group A, 2 of 15 patients had retention of urine while in group B, 5 of 15 patients had urinary retention (Table 13). Shalaby et al¹⁰ reported urinary retention in 14 out of 100 patients (14%) in open group as compared to 7 out of 100 (7%) in stapled group. Ganio¹⁶ reports that retention developed in 5 out of 50 (10%) after open haemorrhoidectomy whereas in 3 out of 50 patients (6%) after stapled haemorrhoidopexy. Smith²¹ have noted that urinary retention is the most common problem after haemorrhoidectomy, its degree related to the amount of surgery and the incisions required.

With regard to return to work/routine activities there was a significant difference between the two groups. The range in group A was between 2 to 7 days with mean of 3.62 ± 1.29 days i.e. most of the patients joined back work before 4 days. However in group B it ranged between 7-15 with a mean of 9.22 ± 3.792 days i.e. it took approximately 10 days for patients of group B to return to work. The p value was < 0.01 (Table 10). Most of the studies reported that the return to work or routine activities is much earlier after stapled haemorrhoidopexy in comparison to the open group^{10,12,15,16,19,20}. However Ortiz¹⁸ et al reported that there was no statistical difference in the meantime to return to work. He said that social and cultural factors need to be taken into account in the assessment of return to work.

Of the 30 patients in the current study, in the follow up period none of the patients had anal stenosis. In the study by Shalaby et al¹⁰ anal stenosis was seen in 2 out of 100 (2%) patients after stapled haemorrhoidopexy and 5 out of 100 (5%) patients after open haemorrhoidectomy. There was no report of anal stenosis in the studies by Mehigan¹⁹ and Ganio¹⁶.

There was no case of recurrence of haemorrhoids in this study. Two studies have been published that compared the long-term outcome of both procedures reported recurrent prolapse in one of 95 patients in the maximum follow up period of one year. However Ganio¹⁶ reported recurrence in 10 of 50 patients after the stapled procedure in the mean follow up of 16 months. He performed telephonic follow up. Probably that may be the reason for a falsely high incidence of recurrence. One of 27 patients who underwent stapled haemorrhoidopexy had a residual thrombosed haemorrhoid as reported by Ortiz¹⁸. One patient each in both groups had recurrence in the study by Hetzer²².

As regards patients evaluation and level of satisfaction, more than 93.33% of patients were satisfied in group A as compared to only 53.33% in group B. Shalaby¹⁰ reports that 92% of patients in stapled group as against 80% in open group were satisfied with the procedure. Mehigan et al¹⁹ reported that 85% of patients were satisfied with stapled haemorrhoidopexy whereas 75% with open haemorrhoidectomy. However in the study by Ortiz et al¹⁸ satisfaction was higher in open haemorrhoidectomy group as compared to stapled group on a scale of 10.

It has been clearly highlighted in studies that considering the cost of hospital admission with economic loss due to absence from work, the open method turned out to be at

par or even expensive in comparison with the stapled technique¹⁷.

Conclusion

Hence the stapled procedure for haemorrhoids is superior to Milligan-Morgan haemorrhoidectomy in terms of postoperative pain, operative time and return to normal activity. It is straightforward and easy to learn. Early functional and symptomatic outcomes have been satisfactory and appear similar or better to those achieved using conventional technique. However, long term follow-up with respect to these factors is necessary to testify this procedure.

The next generation surgeons should emulate this new procedure for its implementation in primary and secondary level health care centres, where this facility is available and simultaneously see the affording capacity of the patients too.

Acknowledgment

Authors acknowledge all their colleagues and juniors for their kind help and cooperation.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval : The study was approved by the institutional ethics committee.

References

1. Goligher JC. In Surgery of the Anus, Rectum and Colon. Haemorrhoids or Piles. 4th Ed. Bailliere Tindall London 1996; Pg 98-149.
2. Hawley PR. Haemorrhoids. In Rec AdvSurg no. 8. Ed. Selwyn Taylor. Churchill Livingstone Edinburg and London 1973 Pg 235-56.
3. Morgagni JB. Seats and causes of diseases, Vol 2. Letter 32, Article 10. London A. Millar. Quoted by Thomson 1975; Pg 105
4. Adams F. The genuine work of Hippocrates. London printed for Sydenham society. Pg825. Quoted by Eisenhammer S. Dis Colon Rect 1969; 12: 288.
5. Arderne JC. In Treatises offistula in ano, haemorrhoids and clysters .Ed D' Arcy Power K Paul, Trench Truber & Co Ltd. London. Quoted by Eisenhammer 1910; Pg 68.
6. Ferguson JA. Diverse methods of managing haemorrhoids - surgical treatment. Dis Colon Rectum 1973; 16: 1730.
7. Eastman PF and Applebaum IA. Critical evaluation of internal haemorrhoidal ligation as an outpatient procedure. Amer J Proctol 1969; 201-09.
8. SeowChoen F. Stapled haemorrhoidectomy: pain or gain Sr J Surg 2001 ;881-3
9. Milligan ETC. Haemorrhoids. Sr Med J 1939; 2 :412
10. Shalaby R, Desoky A. Randomised clinical trial of stapled with Milligan- Morgan haemorrhoidectomy. Sr J Surg 2001; 88: 1049-53
11. MacRae HM & McLeod R. Comparison of haemorrhoidal treatments: a meta-analysis. Can J Surg 1997; 40: 14-7.
12. Rowseil M, Bello M, Hemingway E > M. Circumferential mucosectomy (stapled haemorrhoidectomy) versus conventional haemorrhoidectomy: randomized controlled trial. Lancet 2000; 355: 779-81
13. Beattie Ge, Lam JPH, Loudon MA. A prospective evaluation of the introduction of circumferential stapled anoplasty in the management of haemorrhoids and mucosal prolapse. Colorectal Disease 1999; 2: 137 -42
14. Pernici LM, Bertalucci B, Bencin L et al. Early and late (ten years) experience with circular stapler

- haemorrhoidectomy. *Dis Colon Rectum* 2001; 44: 836-41.
15. Hetzer FH, Demartines N, Handshun AE et al. Stapled vs excisional haemorrhoidectomy: Long term results of a prospective randomised trial. *Arch Surg* 2002; 137: 337-40.
16. Ganio E, Altomare DF, Galrielli F et al. Prospective randomized multicentre trial comparing stapled with open haemorrhoidectomy. *Sr J Surg* 2001; 88: 669-74.
17. Ho Yh, Cheong WK, Tsang C et al. Stapled haemorrhoidectomy - cost and effectiveness: Randomised controlled trial including incontinence scoring, anorectal manometry, and endoanal ultrasound assessment at up to three months. *Dis Colon Rectum* 2000; 43: 1666-75.
18. Ortiz H, Marzo J, Armenderiz P. Randomized Clinical trial of stapled haemorrhoidopexy versus conventional diathermy haemorrhoidectomy. *Br J Surg* 2002; 89: 1376-81
19. Mehigan BJ, Monson JRT, Hartley JE. Stapling procedure for haemorrhoids versus Milligan-Morgan haemorrhoidectomy: randomized controlled trial. *Lancet* 2000; 355: 782-5
20. Pavlidis T, Papziogas B, Souparis A et al. Modern stapled Longo procedure vs conventional milligan-Morgan haemorrhoidectomy: a randomized controlled trial. *Int J Colorectal Dis* 2002; 17: 50-3.
21. Hanock BD and Smith K. Internal Sphincter and Haemorrhoids. *Br J Surg* 1975; 61: 918.
22. Fazio VW. Early promise of the stapling technique for haemorrhoidectomy. *Lancet* 2000; 355: 768-9.
23. Gravié JF, Lehur PA, Hutten N, et al. Stapled hemorrhoidopexy versus milligan-morgan hemorrhoidectomy: a prospective, randomized, multicenter trial with 2-year postoperative follow up. *Ann Surg.* 2005;242(1):29-35.
24. Towliat Kashani SM, Mehrvarz S, Mousavi Naeini SM, Erfanian R. Milligan-Morgan Hemorrhoidectomy vs Stapled Hemorrhoidopexy. *Trauma Mon.* 2012;16(4):175-7.
25. Sachin ID, Muruganathan OP. Stapled hemorrhoidopexy versus open hemorrhoidectomy: a comparative study of short term results. *Int Surg J* 2017;4:472-8