Original Article

A Comparative Study of Outcome of Milligan-Morgan Versus Longo Operation

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Abstract:
Objective: *To establish a surgical approach for the treatment of hemorrhoidal disease which has comparatively better outcome.* ***Methods:*** *This comparative study was conducted over a period of 5 years from January 2013 to December 2017 where selected 100 patients were divided into two equal groups who were underwent open or Milligan-Morgan hemorrhoidectomy (Group-A) and stapled hemorrhoidectomy or Longo operation (Group-B). The study was done at the Department of Surgery, Central Medical College & Hospital, Cumilla, Bangladesh. Data were analyzed using SPSS software v22.0.* ***Results:*** *The mean age were 44.66±8.81 years & 47.00±9.09 years and male to female ratio were 2.3:1 & 2.8:1 in group A and group B respectively. Their hospital stay was 2.26±0.77 days in Group-A & 1.52±0.54 days in Group-B. In this study complications of open hemorrhoidectomy were postoperative excessive pain 4%, hemorrhage 6%, urinary retention 14%, infection 2%, anastomotic dehiscence 0%, anal fissure 6%, liquid incontinence 4%, anal stenosis 10% & recurrence 2% and complications of stapled hemorrhoidectomy were postoperative excessive pain 12%, hemorrhage 4%, urinary retention 4%, infection 0%, anastomotic dehiscence 2%, anal fissure 0%, liquid incontinence 0%, anal stenosis 0% & recurrence 12%. Final outcome of the study was end up with 84.0% exhibited satisfactory outcome in Group-A & 86.0% exhibited satisfactory outcome in Group-B, which were almost similar. Statistical analysis showed that p value was 0.779, which was not significant.* ***Conclusion:*** *Milligan Morgan hemorrhoidectomy is the most widely practiced gold standard surgical technique for the management of hemorrhoids. Staplers are novel methods known for its simplicity, ease and standardization to an anastomosis. Our study was end up with almost similar outcome by open hemorrhoidectomy & stapling technique.*

Key words: Hemorrhoid, Milligan-Morgan operation, Longo operation

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Introduction:
The term hemorrhoids or 'piles' means different things to different people and many patients will use these words to describe a wide variety of anorectal conditions[1]. Hemorrhoidal disease has been a loathsome affliction of mankind[2]. The word hemorrhoids derived from Greek 'haima': blood, 'rhoos': flowing; synonym: piles, Latin 'pila', a ball[3].

To the surgeons however, it refers to abnormalities of the vascular cushions of the anus[1]. The 'vascular cushions' is first published by Thompson in his masters thesis based on anatomic and radiologic studies in 1975 [4]. These cushions are normally maintained in positions by suspensory ligaments. The most widely supported theory is that symptomatic hemorrhoids result from disruption of these ligaments permitting downward prolapse of the cushions into and beyond the anal canal during defaecation[5].

Hemorrhoids typically cause bright red bleeding per rectum, mucus discharge, itching, rectal fullness & lumps outside the anus[6]. Hemorrhoids may be internal, external or interno-external and internal disease is further classified into 1st, 2nd, 3rd & 4th degree which were very often located in 3, 7 and 11 o'clock positions[7].

Complications of hemorrhoids includes strangulation, thrombosis, ulceration, gangrene, portal pyemia, fibrosis, severe hemorrhage[3]. Indications of hemorrhoidectomy comprises 3rd & 4th degree, 2nd degree not cured by non-operative treatment, fibrosed hemorrhoid, interno-external variety when external is well defined[3,8].

Treatment options of hemorrhoidal diseases are conservative approach, sclerotherapy (1869), Barron banding (1963), infrared photocoagulation, Doppler-guided hemorrhoidal dearterialization/ transanal hemorrhoidal dearterialization: (DGHAI-1995), circular stapling (Antonio Longo 1998),

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closed (Ferguson, 1957) and open (Milligan-Morgan 1937) hemorrhoidectomy[9,10].

Hemorrhoidectomy is contraindicated with severe comorbidity and relative contraindications are fecal incontinence, rectocele, bleeding disorder, portal hypertension, Crohn's disease[11].

The aim of our study was to choose a best technique of hemorrhoidectomy by comparing the outcome of open and stapled method.

We accomplished the study where 100 patients were selected according to our methodology who were divided into two equal groups. Patients of Group-A & Group-B were undergone open & stapled hemorrhoidectomy respectively. The outcome of both procedures was observed with the aim of choosing one which will be more beneficial for the patients.

Materials & Methods:
In this comparative study 100 patients were selected from January 2013 to December 2017 who were divided into two equal groups. Group-A comprises 50 patients & Group-B comprises 50 patients who underwent open hemorrhoidectomy & stapled hemorrhoidectomy respectively. Data were analyzed by using software SPSS v22.0. Chi square, unpaired 't' test and Fisher Exact test was done to measure the level of significance.

Inclusion criteria:
1. 3rd & 4th degree hemorrhoid.
2. 2nd degree hemorrhoid with failed medical treatment.
3. Patient who was willing to give consent after counseling of the procedure.
4. Patients age <60 years with no precipitating factors (Constipation, BHP, Stricture urethra, Pregnancy, Carcinoma rectum, etc.).

Exclusion criteria:
1. 1st degree hemorrhoid.
2. Simultaneous presence of other perianal diseases like fissure or fistula in ano.
3. Patient who was not agree with the operative procedure.
4. Patients age > 60 years with active comorbidity (Bronchial asthma, Uncontrolled DM, Recent H/O MI).

Surgical Technique: All the patients (100) were undergone hemorrhoidectomy in lithotomy position. Among them 50 patients were selected in Group-A and remaining 50 patients were in Group-B and their operative procedure were done under saddle block & subarachnoid block respectively. Patients of both group were cleansed their bowel 6 hours prior to operation by enema simplex.

Open Hemorrhoidectomy (Milligan Morgan or excisional open hemorrhoidectomy): Artery forceps are applied to the skin-covered external components of the piles and traction exerted to reveal the internal components, which are also grasped by artery forceps, when held out by the assistant these pairs of artery forceps form a triangle.

The operator takes the left lateral pair of artery forceps in the palm of the hand and places the extended forefinger in the anal canal to support the internal hemorrhoid. In this way traction is applied to the skin of the anal margin. With scissors or cutting diathermy, a V-shaped cut is made through the skin and those fibers inserting into it around the skin-holding artery forceps. Traction by both operator and assistant, combined with careful dissection, expose the lower border of the internal sphincter. The dissection proceeds up the anal canal, with the sides of the mucosal dissection converging towards the pile apex and with the internal sphincter visible and separate from the dissected pile. A transfixion ligature of 1/0 catgut is applied to the pedicle at this level, the pile is excised well distal to the ligature and, after ensuring hemostasis, the ligature is cut long. Each hemorrhoid is dealt with in this manner, taking care to leave muco-cutaneous bridges. Hemostasis must be absolute at the end of the procedure. The margins of the skin wounds were trimmed so as not to leave overhanging edges. Bleeding subcutaneous arteries having been secured, the areas denuded of skin are dressed with lidocaine jelly gauze. A pad of gauze and wool and a firmly applied T-bandage complete the operation.

Figure-1: Multiple hemorrhoids in all positions.

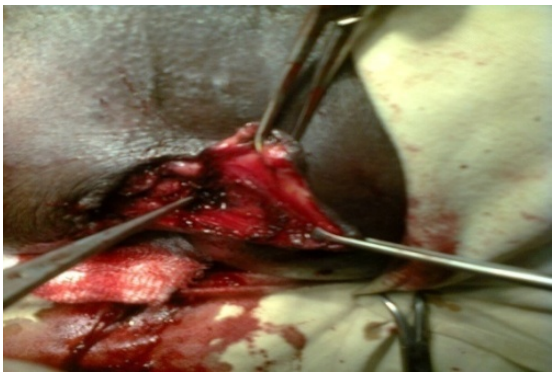

Figure-2: Excision of single hemorrhoid

Stapled Hemorrhoidectomy: The other name of this procedure is Longo operation consists of the resection of the prolapsed mucosa and ligature of the internal hemorrhoidal pedicles. The entire procedure is performed within the non-sensorial zone of the rectum above the dentate line. The anatomy of the anal canal is preserved and there is no injury to the skin or the sphincter system.

Patients are prepared and positioned for stapled hemorrhoidopexy as for hemorrhoidectomy. Prolapsing internal hemorrhoids are reduced into the anal canal. A circular anoscope is introduced into the anal canal. A specially designed semicircular anoscope is used to facilitate the placement of a circumferential purse string suture into the mucosa and submucosa proximal to the internal hemorrhoids. A circular stapler is introduced into the anal canal. The purse string is tightened and secured around the stapling device. This draws a circumferential ring of mucosa and submucosa into the head of the stapler.

Firing of the stapler simultaneously excises this ring of tissue and secures the redundant mucosa/ hemorrhoids high in the anal canal with a ring of titanium staples. Although some hemorrhoidal tissue is excised, the operation primary functions as a technique of fixation, reflected by the name 'hemorrhoidopexy'. There are no external incisions or staples, thus postoperative pain is reduced.

Figure-3: Introduction of anoscope

Figure-4: Firing of stapling gun

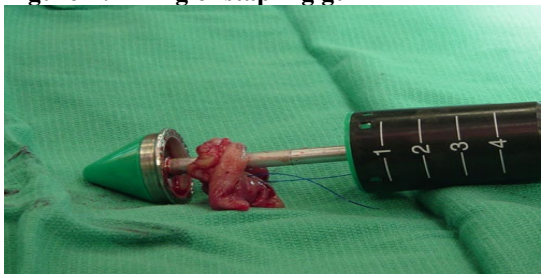

Figure-5: Removal of 'doughnut' of tissue

Results:
During the 5 years of study period, the included candidate were divided into Group-A for open hemorrhoidectomy & Group-B for stapled hemorrhoidectomy. The mean age were 44.66±8.81 years & 47.00±9.09 years and male to female ratio were 2.3:1 & 2.8:1 in group A and group B respectively. Their hospital stay time was 2.26±0.77 days in Group-A & 1.52±0.54 days in Group-B. Most common socioeconomical status was average which was 66.0% in Group-A & 58.0% in Group-B.

Table-I: Demographic profile of the study groups (n=100)

Factor	Group		p value
	Group A No. (%)	Group B No. (%)	
Age			
31 – 40	16 (32.0)	14 (28.0)	0.318
41 – 50	21 (42.0)	16 (32.0)	
51- 60	13 (26.0)	20 (40.0)	
Mean±SD	44.66±8.81	47.00±9.09	
Sex			
Male	35 (70.0)	37 (74.0)	0.656
Female	15 (30.0)	13 (26.0)	
Socioeconomic status			
Rich	7 (14.0)	10 (20.0)	0.659
Average	33 (66.0)	29 (58.0)	
Poor	10 (20.0)	11 (22.0)	
Duration of Hospital stay (days) Mean±SD	2.26±0.77	1.52±0.54	<0.001

Common mode of presentation were something coming down during defecation, bleeding per rectum & itching; which were 58%, 27%, 30% for open technique & 62%, 24%, 54% for stapling procedure respectively. Final diagnosis of the both study group were end up with 2nd, 3rd, 4th degree hemorrhoids in different position (3, 7, 11 o'clock). In terms of degree of hemorrhoids which were 18%, 52%, 30% in Group-A & 26%, 64%, 10% in Group-B respectively and in terms of position 60%, 98%, 88% were in 3, 7, 11 o'clock position in Group-A & 56%, 96%, 78% in Group-B respectively (Table-II). All the patients of Group-A were operated by Milligan-Morgan procedure under saddle block and Group-B were operated by Longo technique under subarachnoid block.

Table-II: Presenting complains of the study groups (n=100)

Presenting complain	Group		p value
	Group A No. (%)	Group B No. (%)	
Something coming down	29 (58.0)	31 (62.0)	0.680
P/R Bleeding	14 (28.0)	12 (24.0)	0.646
Itching	15 (30.0)	27 (54.0)	0.015

During this study, complications of (Figure 6) open hemorrhoidectomy were postoperative excessive pain 4%, hemorrhage 6%, urinary retention 14%, infection 2%, anastomotic dehiscence 0%, anal fissure 6%, liquid incontinence 4%, anal stenosis 10% & recurrence 2% and complications of stapled hemorrhoidectomy were postoperative excessive pain 12%, hemorrhage 4%, urinary retention 4%, infection 0%, anastomotic dehiscence 2%, anal fissure 0%, liquid incontinence 0%, anal stenosis 0% & recurrence 12%.

Table-III: Local examination findings of the study groups (n=100)

Factor	Group		p value
	Group A No. (%)	Group B No. (%)	
Degree of hemorrhoids			
2nd degree	9 (18.0)	13 (26.0)	0.042
3rd degree	26 (52.0)	32 (64.0)	
4th degree	15 (30.0)	5 (10.0)	
Position of hemorrhoids			
3 o'clock	30 (60.0)	24 (48.0)	0.229
7 o'clock	49 (98.0)	49 (98.0)	1.000
11 o'clock	44 (88.0)	39 (78.0)	0.183

In case of open hemorrhoidectomy 2 cases of postoperative hemorrhage were found due to bleeding from minute vessels and diathermic cautery solved the problem and in 1 case slippage of ligature occurred due to straining effect; so ligation of the pedicle stopped the bleeding. Infection was needed change of antibiotics. Anal fissures subsided with conservative treatment & incontinence was treated by colorectal consultation & improved by time. All the anal stenosis is recovered by self-anal dilatation except one which was operated by anoplasty & recurrent cases required re-operation.

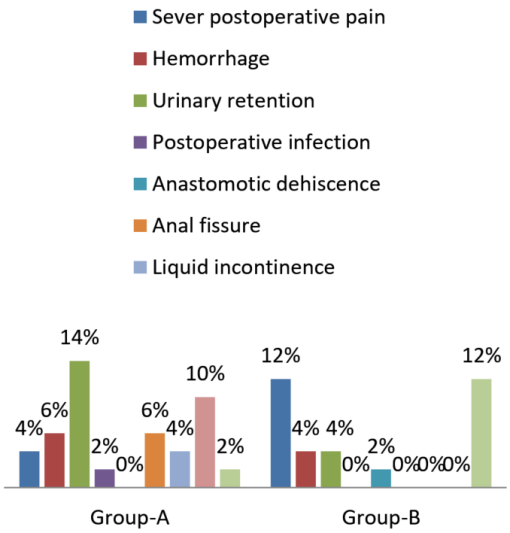

Figure-6: Complications of the study groups

Misshaped after stapled hemorrhoidectomy were postoperative hemorrhage occurred due to bleeding from suture lines & treated by additional stitches with 3/0 vicryl. Anastomotic dehiscence was treated with colorectal consultation & recurrence was solved by open hemorrhoidectomy.

In both cases excessive pain were managed by IM pethidine 8 hourly for 2-3 days. Most of the urinary retention managed by trial of micturition or catheterization.

Final outcome of the study was end up with 84.0% exhibited satisfactory outcome in Group-A & 86.0% exhibited satisfactory outcome in Group-B, which were almost similar.

In our study period, most of the patient came to follow up regularly for first few months, but subsequently those who had problem only they were visited & remaining patients were not in contact. So in our perspective those who did not come according to our follow up schedule we think they had no problem. Most patients returned to work within 7 days after Longo procedure & after one month in Milligan Morgan operation.

Table-IV: Distribution of the study subjects by final outcome

Group	Final Outcome		p value
	Satisfactory	Unsatisfactory	
Group-A	42 (84.0)	08 (16.0)	0.779
Group-B	43 (86.0)	07 (14.0)	

The final outcome was measured as satisfactory or unsatisfactory. Of the total 50 patients in each group, 84.0% exhibited satisfactory outcome in Group-A & 86.0% exhibited satisfactory outcome in Group-B in terms of no anastomotic dehiscence, liquid incontinence, anal stenosis or recurrence. Patients with anastomotic dehiscence, liquid incontinence, anal stenosis & recurrence required further surgical intervention & separate settings of hospital admission to recover. Hence, the summations of those complications which lengthen the patients' recovery are termed as unsatisfactory results. Chi-square test demonstrates that observed proportion is not statistically significant (p = 0.779). According to the outcome it can be concluded that both stapled technique and open procedure are similar.

Discussion:

This study was carried out with the aim of comparing the patients of two groups with their operative morbidity to find out a technique for surgical treatment of hemorrhoid which will be relatively more convenient for the patient.

During the study period we have selected 50 patients in each group who were suffering form hemorrhoidal disease and where operative treatment were indicated and Group-A recieved open

hemorrhoidectomy & Group-B received stapled hemorrhoidectomy.

Common mode of presentation were something coming down during defecation, bleeding per rectum & itching; which were 58%, 27%, 30% in open technique and 62%, 24%, 54% for stapling procedure respectively in this study. Gravie *et al.* found in their same type of study lump in the anus, P/R bleeding, itching, discharge & pain were 90%, 47%, 35%, 31% & 15% respectively[12]. Common symptoms described by Jonathan *et al.* were bleeding, irritation, fullness, prolapse, difficult hygiene and seepage[13].

Final diagnosis of the both study group were end up with 2nd, 3rd, 4th degree hemorrhoids in different position (3, 7, 11 o'clock). In terms of degree of hemorrhoids which were 18%, 52%, 30% in Group-A & 26%, 64%, 10% in Group-B respectively and in terms of position 60%, 98%, 88% were in 3, 7, 11 o'clock position in Group-A & 56%, 96%, 78% in Group-B respectively. Lumb KJ *et al.* told a number of clinical grading scales are in use. The most widely accepted system is Grade-1: Never prolapse, Grade-2: Prolapse on dedaecation, spontaneously reduce, Grade-3: Prolapse on dedaecation, require manual reduction, Grade-4: Permanent prolapse[14]. Hemorrhoids are characteristically lie in the 3, 7 & 11 o'clock positions with the patient in the lithotomy position[3].

Here complications of open hemorrhoidectomy were postoperative excessive pain 4%, hemorrhage 6%, urinary retention 14%, infection 2%, anastomotic dehiscence 0%, anal fissure 6%, liquid incontinence 4%, anal stenosis 10% & recurrence 2% & complications of stapled hemorrhoidectomy were postoperative excessive pain 12%, hemorrhage 4%, urinary retention 4%, infection 0%, anastomotic dehiscence 2% & anal fissure 0%, liquid incontinence 0%, anal stenosis 0% & recurrence 12%.

Kashani *et al.* showed in their series the complications of open hemorrhoidectomy were postoperative excessive pain 5%, recurrence 5%, transient incontinence 2%, perianal abscess 2%, urinary retention 2% and anal stenosis & permanent incontinence was 0%[15]. Bouchard *et al.* found three recurrence of hemorrhoid out of 633 patients undergone open techniquue[16].

Ravo *et al.* described that complications of stapled hemorrhoidectomy were severe pain 5%, bleeding 4%, thrombosis 2%, urinary retention 1%, submucosal abscess 1%, anal stenosis 1%, recurrence 2%, fecal urgency 1%, skin tag 0.5%, staples problem 1%, gas flatus & liquid incontinence 2%, anastomotic dehiscence 0.5%, anal fissure 1%, anal stenosis 1%[17].

To treat anal stenosis we used anal dilatation & anoplasty. Lee mentioned it was easily treated by manual dilatation[18]. Stenosis can also be reduced by avoiding circumferential procedures on all sides of the anal canal & excessive use of cautery. Adequate bridges of skin and mucosa must be left intact between the excisions to prevent stenosis developing during healing[19].

So, at the end of our study complications like postoperative excessive pain, hemorrhage, urinary retention, infection, anal fissure were treated with minimal effort & all the patients responded well with good recovery. They are included with satisfactory outcome. Thus, 14% exhibited unsatisfactory outcome in Group-A & 16% exhibited unsatisfactory outcome in Group-B and from this point of view the significant difference between study group is minimum but stapled technique had better outcome. Giordano P *et al.* told outcome of hemorrhoidectomy on the basis of prolapse recurrence rate is significantly higher in stapled technique[20]. Kashani *et al.* showed in their result where full recovery was achieved in 92.5% of the cases in stapled hemorrhoidectomy and 95% of the cases in open hemorrhoidectomy which was also not significant either[15]. By this study we proved that post operative final outcome of open & stapled technique is similar.

Conclusion:

Longo operation has some benefit over the open procedure in terms of shorter hospital stay, early return to work but it is still costly to our patients. So, early functional and symptomatic outcomes have been slightly higher with stapled hemorrhoidectomy between two randomly assigned groups of fifty patients each for the two procedures of Open versus Stapled method. So by this study in term of better outcome we will recommend the Milligan-Morgan and Longo operation has similar outcome for the patients with hemorrhoidal disease who required surgery.

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