



## Comparative Study of Stapled and Open Hemorrhoidectomy

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### ABSTRACT

**Background and Objectives:** *Stapled Hemorrhoidectomy has rapidly become established as the popular alternative to open Hemorrhoidectomy, it has a safety profile better than open procedure.*

#### Objectives:

*To compare the short term outcome of Stapled Hemorrhoidectomy, with Open haemorrhoidectomy (Milligan-Morgan) in terms of*

*Duration of surgery*

*Post operative pain and analgesia*

*Safety and efficacy of the procedure*

*Procedure time*

*Intra-op complication*

*Duration of hospital stay*

*Post operative complications*

*Days taken for Return to Work*

*Anorectal physiological functions and recurrence*

*Patient satisfaction*

**Methods:** *Prospective study from Oct 2014 to June 2016, involved 90 patients undergoing surgery for haemorrhoid at Krishna Institute of Medical Sciences, Karad who fulfilled the criteria were included in the study. Forty five underwent Milligan Morgan technique of open haemorrhoidectomy and forty five underwent Longo technique of Stapled hemorrhoidectomy.*

*Descriptive statistical analysis has been carried out in the present study. Significance is assessed at 5 % level of significance, Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale in parametric condition between two groups (Inter group analysis) and Mann Whitney U test (two tailed, dependent) has been used to find the significance of study parameters on continuous scale in non-parametric condition within each group. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two groups.*

**Results:** *stapled hemorrhoidectomy is associated with shorter duration of surgery, less postoperative pain and need for analgesia, shorter duration of hospital stay and a quicker recovery, earlier return to work and a high patient satisfaction as compared with Conventional hemorrhoidectomy (Milligan Morgan technique) of*

*Open Hemorrhoidectomy.*

**Conclusions:** *The findings of our study confirm that stapled hemorrhoidopexy is associated with shorter duration of surgery, less postoperative pain and need for analgesia, shorter duration of hospital stay and a quicker recovery, earlier return to work and a high patient satisfaction as compared with Conventional hemorrhoidectomy (Milligan Morgan technique) of Open Hemorrhoidectomy. The procedure is not associated with major post operative complications. There is no recurrence, residual prolapse or incontinence in the follow up period of six months.*

*We conclude that stapled hemorrhoidopexy is safe with many short-term benefits. It is a novel technique and has emerged as an alternative to open hemorrhoidectomy, long considered the "gold standard".*

## Introduction

Hemorrhoids are one of the most common benign anorectal problems worldwide.

The treatment of third and fourth degree hemorrhoids is surgical<sup>1</sup>. Hemorrhoidectomy is one of the most commonly performed anorectal operations<sup>2</sup>. Milligan- Morgan Hemorrhoidectomy as described in 1937 has remained the most popular among many surgical techniques proposed<sup>3</sup>. Surgical hemorrhoidectomy has a reputation for being a painful procedure for a fairly benign disease, causing postoperative pain needing about 2-3 days hospital stay with a convalescence of at least one month<sup>4,5</sup>. Stapled hemorrhoidopexy is an exciting modality that represents a paradigm change in the management of hemorrhoids<sup>6</sup>. However it has been met with a mixture of scepticism and interest<sup>7</sup>.

Stapled hemorrhoidectomy, later termed stapled hemorrhoidopexy (PPH), was first described in 1995<sup>8,9</sup>. It has been associated with improved short-term outcomes, including less postoperative pain, shorter operating times, earlier return to work, and greater patient satisfaction<sup>4,5,10,11,12</sup>.

The present study was designed to compare the short term results of stapled hemorrhoidopexy with Milligan- Morgan Hemorrhoidectomy.

## Materials and Methods

### Materials

#### Source of Data

Ninety patients undergoing surgery for haemorrhoids at Krishna Institute of Medical Sciences Hospital, Karad.

#### Period of study

1st October, 2014 to 31st June 2016

## Inclusion Criteria

- Grade 3 and grade 4 Haemorrhoids
- Age > 18 years
- Prolapsed haemorrhoids

## Exclusion Criteria

- Acute haemorrhoidal episodes with thrombosis
- Prior haemorrhoidectomy
- Asymptomatic first degree haemorrhoids
- Intercurrent anal pathology (like fistula in ano and anal fissure)
- Previous rectal surgery
- Prolapse of single anal cushion
- Systemic diseases like AIDS
- Colonic malignancy
- Anal stenosis

## Methodology

The present study was conducted in the Department of Surgery, Krishna Institute of Medical Sciences, Karad over a duration of two years. The study was a prospective study comparing Milligan Morgan haemorrhoidectomy and Stapled haemorrhoidopexy for the management of grade 3 and 4 haemorrhoids.

The study was approved by the institutional ethics committee and guidelines laid out by Indian Council of Medical Research (ICMR). Written informed consent was taken from the patients participating in the study.

Ninety patients undergoing surgery for haemorrhoids at Krishna Institute of Medical Sciences, Karad who fulfilled the criteria were included in the study. Forty five underwent Milligan Morgan technique of open

haemorrhoidectomy and forty five underwent Longo technique of Stapled hemorrhoidopexy.

Patients were subjected to clinical examination and routine laboratory investigations preoperatively. All patients were operated on an inpatient basis. Patients hospital stay for analysis was calculated starting from the day of surgery. Preoperatively patients were kept nil per oral overnight and received a phosphate enema in the morning of day of surgery. One dose of ciprofloxacin and metronidazole were given at the time of anaesthesia for surgery. All operations were performed in the lithotomy position under spinal anaesthesia. Patients were reexamined under anaesthesia to confirm the grade of haemorrhoids and to rule out associated anal pathologies like anal fissure and fistula in ano.

In the Milligan Morgan technique of open haemorrhoidectomy, a Hill- Ferguson retractor is placed into the anal canal to reveal the extent of haemorrhoids. Next a clamp is placed incorporating the vascular cushion to be excised along with any skin tag. Excision was accomplished with a scalpel, scissors or electrocautery. The incision should be carried beyond the anal verge and proximally into the anal canal to include the haemorrhoidal plexuses. The internal sphincter is carefully dropped away from the plane of dissection. After complete dissection and mobilization of the haemorrhoid pedicle, a suture ligature is placed using absorbable material and the haemorrhoid is excised. Haemostasis is achieved with electrocautery with the suture. A small dressing is applied following wound cleansing.

The stapled procedure was performed according to the technique described by Longo. A 33-mm circular stapling device part of PPH03 kit (proximate; Ethicon endosurgery, Cincinnati, Ohio, USA) was used. The PPH03 kit includes all of the required components of the procedure, except for a suture. The kit contains a stapling device, circular anoscope (with an obturator), a suturing anoscope, which facilitates the placement of the purse string, and a suture threader, which is a hook-shaped instrument used to pull the tail of

the purse string through the head of the stapling instrument.

The anal sphincter is progressively dilated to three fingers and the circular anoscope inserted without tearing any muscle fibers. The circular anoscope is translucent, which allows for visualization of the dentate line at all times. Some surgeons elect to suture the hub of the scope to the perianal skin with several nylon sutures, but this maneuver is entirely optional. Next, the purse string suture anoscope is inserted through the circular anoscope. This anoscope is a semicircular instrument that facilitates the placement of the purse string suture. A purse – string suture of 2/0 polypropylene was inserted at least 4cm above the dentate line, catching only the mucosa and submucosa. Once placed circumferentially, the purse string suture anoscope is removed from the circular anoscope. The stapler is inserted through the circular anoscope, with the head of the stapler maximally opened.

The head is then passed through the purse string suture. The purse-string suture was tied on the stapler shaft, and the head of the instrument was closed on the anvil incorporating the redundant mucosal tissue in the purse-string within the head of the gun. The suture threader is then passed through each of the side channels on the stapler head, and the tails of the purse string suture are brought out from either side of the head of the stapler. The staple line will lie 1 to 2 cm distal to the suture height. Once the tails of the suture are brought through the side channels of the stapler head, gentle traction is applied to the suture, thus drawing the redundant mucosa into the head of the stapler.

The stapler itself is advanced into the anal canal such that the 4 cm mark on the head of the stapler is at the level of the anal verge, and the stapler head is tightened. Care is taken to keep the stapler in the same axis as the long axis of the anal canal to avoid deforming the anal canal. The suture is then tightened and tied around the shaft of the stapler. When fully closed, the stapler is fired. A 1 to 3 cm circular band of mucosa/submucosa is excised.

The stapler was then fired and held closed for 30 seconds to aid haemostasis. The stapler is then fully opened and then gently withdrawn. The staple line was inserted for bleeding points. Hemostatic sutures were inserted if there were bleeding points. A small dressing is applied following wound cleansing.

In women, a finger is inserted into the vagina as the purse string is being placed, when it is tightened around the shaft of the stapler, and when the stapler is closed but not yet fired. Examining the vagina for dimpling or pulling of tissue into the stapler head at these three steps should prevent inadvertent inclusion of the vagina into the staple line.

Post operative management consisted of standard nursing care and analgesia.

Patient was started on a soft oral diet within 4 hours postoperatively. Dressing is removed on the morning after surgery and a local external visual examination is done. Post operative pain was managed according to the guidelines of French Anaesthesia Society. Pain was assessed using a visual analog scale (VAS) where 0 represented no pain and 10 represented the worst pain ever. The pain score was recorded every 6 hr during the first postoperative day, at the time of first motion and daily until the end of the first week. The aim was to keep the VAS score below 5 with adequate analgesia. Prescribed analgesics were classified using the world health organisation (WHO). Analgesics were administered on the basis of the VAS score in <3, class I analgesic (paracetamol); between 3 and 5, class II analgesic (codeine, dextropropoxyphene-paracetamol) or VAS>5, class III analgesic (with paracetamol). If a given analgesic was having a partial effect, an analgesic of the next class was prescribed.

In addition to analgesics, patients are advised Antibiotics (in tablet form) Ciprofloxacin 500mg twice daily, Metronidazole 400 mg thrice daily and Syrup Lactulose 20 ml at bedtime for two weeks. Patients undergoing openhemorrhoidectomy are also advised Sitz bath twice daily for two weeks. Patients were discharged when pain control and home circumstances permitted. An

outpatient appointment for review was given one week after surgery. Patients were advised to report immediately in cases of emergency. Patients were reviewed at 1 week and 3 weeks postoperatively and between 6-10 weeks postoperatively. On follow up patients were asked to rate the control of their symptoms, degree of continence to flatus and faeces, duration to return to normal activities and any other problems they had. A physical examination was also carried out at each follow up. The outcome measures were postoperative pain, analgesia requirement, operative time, hospital stay, time to return to normal activity, continence, patient satisfaction and complications. MIPH Patient Data Collection Sheet was used for data collection.

### Statistical Methods

Descriptive statistical analysis has been carried out in the present study. Significance is assessed at 5 % level of significance, Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale in parametric condition between two groups (Inter group analysis) and Mann Whitney U test (two tailed, dependent) has been used to find the significance of study parameters on continuous scale in non-parametric condition with in each group. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two groups.

### Results

**Study Design:** A Comparative study consisting of 90 patients divided in two groups, 45 into Stapled Hemorrhoidectomy and 45 in Open hemorrhoidectomy is undertaken to study the short term results.

**Table 1:** Comparison of Age Distribution of Patients Studied

Age in years	STAPLED		OPEN		TOTAL	
	No	%	No	%	No	%
21-30	11	24.4	14	31.1	25	27.8
31-40	14	31.1	11	24.4	25	27.8
41-50	15	33.3	13	28.9	28	31.0
51-60	5	11.1	5	11.1	10	11.1
>60	0	0.0	2	4.4	2	2.1
Total	45	100.0	45	100.0	90	100.0
Mean ±SD	39.69±9.49		39.02±11.03		39.36±10.22	

Samples are age matched with P=0.759

**Table 2:** Comparison of Gender Distribution of Patients Studied

Gender	STAPLED		OPEN		TOTAL	
	No	%	No	%	No	%
Male	24	53.3	33	73.3	57	63.3
Female	21	46.7	12	26.7	33	36.7
Total	45	100.0	45	100.0	90	100.0

Samples are not gender matched with P=0.049\*

**Table 3:** Comparison of Grade of Patients Studied

Grade	STAPLED		OPEN		TOTAL	
	No	%	No	%	No	%
Grade 3	22	48.9	21	46.7	43	47.8
Grade 4	23	51.1	24	53.3	47	52.2
Total	45	100.0	45	100.0	90	100.0

Samples are matched based on grade with P=0.833

**Table 4:** Comparison of Duration of Surgeries

Duration Of surgeries(minutes)	STAPLED		OPEN	
	No	%	No	%
20-30	17	37.8	4	8.9
31-40	22	48.9	13	28.9
41-50	5	11.1	16	35.6
>50	1	2.2	12	26.7
Total	45	100.0	45	100.0
Mean ±SD	35.22±7.23		45.67±11.94	

Duration of surgery is significantly low In STAPLED group with t=5.018;P<0.001\*\*

**Table 5:** Complete or Incomplete Circumferential Donut in STAPLED group of patients

	Number	%
Complete	42	93.3
Incomplete	3	6.7
Total	45	100.0

**Table 6:** Post-surgeries Findings

Post-surgeries findings	STAPLED (n=45)		OPEN (n=45)		P value
	No	%	No	%	
Bleeding	6	13.3	10	22.2	0.270
Supportive stitch	5	11.1	9	20.0	0.245
Residual Prolapse	0	0.0	23	51.1	<0.001**

**Table 7:** Comparison of Duration of Hospital Stay in Days

Duration of hospital in stay days	STAPLED		OPEN	
	No	%	No	%
Up to 2	36	80.0	1	2.2
2-4	9	20.0	35	77.8
>4	0	0.0	9	20.0
Total	45	100.0	45	100.0
Mean ± SD	1.96 ± 0.55		3.51 ± 0.72	

Duration of hospital stay is significantly low in STAPLED group with t=11.462;P<0.001\*\*

**Table 8:** Comparison of Pain Scores in Two Groups of Patients

Pain scores(VAS)	STAPLED	OPEN	P value
6 hours	1.78 ± 0.77	2.89 ± 0.86	<0.001**
12 hours	1.82 ± 0.61	2.13 ± 0.82	0.047*
24 hours	1.42 ± 0.62	1.89 ± 0.80	0.003**

P values are obtained based on Mann Whitney U test

**Table 9:** Complications

Complications	STAPLED (n=45)		OPEN (n=45)		P value
	No	%	No	%	
Retention	7	15.6	14	31.1	0.081+
Bleeding	5	11.1	9	20.0	0.245
Pain	13	28.9	26	57.8	0.006**
Incontinence	0	0.0	2	4.4	0.494

**Table 10:** Comparison of Return to Work in Days in Two Groups of Patients

Return to work in days	STAPLED		OPEN	
	No	%	No	%
<7 days	22	48.9	0	0.0
7-14 days	22	48.0	17	37.8
>14 days	1	2.2	28	62.2
Total	45	100.0	45	100.0
Mean ± SD	8.36 ± 3.35		16.80 ± 4.19	

Return to work is significantly early in days in STAPLED group with t=10.571;P<0.001\*\*

**Table 11:** Comparison of Patient Satisfaction Score

Patient satisfaction score	STAPLED		OPEN	
	No	%	No	%
1	0	0.0	0	0.0
2	3	6.7	5	11.1
3	2	4.4	18	40.0
4	33	73.3	16	35.6
5	7	15.6	6	13.3
Total	45	100.0	45	100.0
Mean ± SD	3.98 ± 0.69		3.51 ± 0.87	

Significantly higher satisfaction score in patients with STAPLED with P=0.003\*\* by Mann Whitney U test

**Table 12:** Follow up status

Follow up status	STAPLED (n=45)		OPEN (n=45)		P value
	No	%	No	%	
Incontinence At 1 <sup>st</sup> month	0	0.0	3	6.7	0.242
Incontinence at 3 <sup>rd</sup> month	0	0.0	0	0.0	-
Recurrence at 6 <sup>th</sup> month	1	2.2	4	8.9	0.361

**Table 13:** Comparison of oral medicine & IV injections in two groups of patients

	STAPLED	OPEN	P value
Oral medicine	5.89 ± 2.86	11.04 ± 2.27	<0.001**
IV Injection	1.02 ± 0.87	2.89 ± 0.71	<0.001**

**Statistical Methods**

Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance, Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale in parametric condition between two groups (Inter group analysis) and Mann Whitney U test (two tailed, dependent) has been used to find the significance of study parameters on continuous scale in non-parametric condition within each group. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two groups

1. Mann Whitney U test

$$Z = \frac{T_{obs} - \mu_T}{\sigma_T}$$

Where  $T_{obs}$  Sum of ranks in  $n_a$  Group A and  $n_b$  Group B

$\mu_T$  Expected values is equal to or  $T_A$  and

$$\frac{na(N+1)}{2} \quad \frac{nb(N+1)}{2}$$

For TB

**1. Chi-Square Test**

$$\chi^2 = \frac{\sum(O_i - E_i)^2}{E_i}$$

Where  $O_i$  is Observed frequency and  $E_i$  is Expected frequency

**2. Fisher Exact Test**

	Class1	Class2	Total
Sample1	a	b	a+b
Sample2	c	d	c+d
Total	a+c	b+d	n

2. Fisher Exact Test statistic=

$$\sum P = \frac{(a+b)!(c+d)!(a+c)!(b+d)!}{n! \cdot a! b! c! d!} \quad 1$$

3. Student t test (Two tailed, independent)

$$t = \frac{(x_1 - x_2) - (\mu_1 - \mu_2)}{\sqrt{S^2 (1/n_1 + 1/n_2)}}$$

Where  $s^2 =$

$$\frac{(n_1 + 1) \cdot \sum_{i=1}^{n_1} (x_1 - \bar{x}_1)^2 + (n_2 + 1) \cdot \sum_{i=1}^{n_2} (x_2 - \bar{x}_2)^2}{n_1 + n_2 - 2}$$

4. Significant figures

- + Suggestive significance (P value: 0.05 < P < 0.10)
- \* Moderately significant (P value: 0.01 < P ≤ 0.05)
- \*\* Strongly significant (P value : P ≤ 0.01)

**Statistical software**

The Statistical software namely SPSS 15.0, Stata 8.0, MedCalc 9.0.1 and Systat 11.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc. (70,71,72)

**Discussion**

Hemorrhoidectomy is the accepted method for the treatment of large symptomatic piles. Open 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.

Stapled hemorrhoidopexy was introduced in 1995 by Longo. 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 already demonstrated that this technique is associated with less postoperative pain and a quicker recovery. Right from the earliest study, there is a high patient satisfaction rate.

However, most of these studies were conducted in highly specialized centers. The present study was designed to compare the short term results of stapled hemorrhoidopexy with Milligan- Morgan Hemorrhoidectomy. Our goals were to find out if the results of the stapled hemorrhoidopexy are the same as those reported in the literature when the operation is performed at independent centers.

Ninety patients undergoing surgery for hemorrhoids at Krishna Institute of Medical Sciences, Karad fulfilled the criteria and were included in our study. Forty five underwent Longo technique of Stapled hemorrhoidopexy and forty five underwent Milligan Morgan technique of openhemorrhoidectomy. 48.9% patients had Grade 3 in stapled and 46.75% in open, and 51.1% had grade 4 in stapled and 53.3% in open.

The mean (s.d) age was 39.36(10.22). In open haemorrhoidectomy group 73.3% were males and 26.7% were females. And in stapled haemorrhoidopexy 53.3% were males and 46.7% were females. Samples are matched based on grade with  $P=0.833$ .

The duration of surgery (minutes) was compared in the two groups . In the stapled group 37.8% underwent within 20 – 30 min. The mean duration of surgery was 35 min, ranging from 25 to 55 minutes. In the open group mean of 46 minutes, ranging from 25 to 55 minutes. Duration of surgery is significantly low in stapled group with  $t=5.018; P<0.001^{**}$ .

This is similar to the observation of other studies. However, the duration is 5 to 10 minutes longer than observed by many others (Rowell M, et al ,2000; Mehigan BJ,2000,Khalil KH, 2000; Bikhchandani J,2005).<sup>5,6,14,13</sup>

Tjandra JJ, Chan MK., (2007) published systematic review on stapled hemorrhoidopexy of all randomized, controlled trials until August 2006 (74). Stapled hemorrhoidopexy was associated with less operating time (weighted mean difference, -11.35 minutes;  $P = 0.006$ ). In our study the mean difference was comparable (11 min).

Stolfi,et al (2008) in a study involving one hundred seventy one patients comparing stapled hemorrhoidopexy and milliganmorgan technique, mean surgical time was 28min.<sup>75</sup>

Franc H. Hetzer, et all (2002) also observed a mean of 30 minutes. Dilatation of the anal sphincter before stapler introduction was routinely performed. The authors suggested this as a possible cause for the prolonged operating time .<sup>15</sup>



The largest trial describing experience with 3,711 stapled hemorrhoidopexies was published recently by Ng KH, et al (2006).<sup>16</sup> The median duration of operation was 15 minutes (range 5 to 45 minutes), much lower than most studies.

In our study, post operative pain was managed according to the guidelines of French Anaesthesia Society. Pain was assessed using a visual analog scale (VAS). The aim was to keep the VAS score below 3 with adequate analgesia classified using the world health organisation (WHO). Analgesics were administered on the basis of the VAS score.

Comparison of Pain scores in two groups of patients was carried out. The pain scores were maintained below 3 in all patients. The pain scores were significantly higher in the open group at 6 hours, 12 hours, 24 hours and at first defecation.

Comparison of oral medicine & IV injections in two groups of patients was carried out. Oral medication need was double in the open group as compared to stapled group (5.89 /11.04) and the need for Iv injections was nearly thrice (1.02/ 2.89).

Tjandra JJ, et al (2007) report less pain after stapled hemorrhoidopexy, as evidenced by lower pain scores at rest and on defecation and 37.6 percent reduction in analgesic requirement. Stolfi, et al (2008) reported postoperative pain on first two postoperativedays was similar. Cheetham et al (Lancet, 2000) a controversial study that reported significantly more pain in stapled group.<sup>17</sup> The pain was probably due to low staple line.

In our study the mean duration of hospital stay (in days) was 2 days in the stapled group as compared to 3.5 days in the open group. 80 % were discharged within 2 days in the stapled group, whereas only 2 % in the open group. 80% were discharged at the end of 4 days in the open group. Duration of hospital stay is significantly low in Stapled group with  $t=11.462$ ;  $P<0.001^{**}$ .

Our study supports the earlier findings of shorter hospital stay in patients undergoing stapled hemorrhoidopexy as reported by Tjandra JJ, et al (2007) (weighted mean difference, -1.07 days;  $P = 0.0004$ ).

When comparing time taken for return to work in days in two groups of patients, a mean of 8 days in stapled group and 16 in open group was noted. About 50 % of stapled group had returned to work at the end of one week and the rest by two weeks. Only one patient took 16 days to return to work.

Franc , et al (2002) patients returned to work at an average of 6.7 days (range, 2-14 days) in the stapler group and 20.7 days (range, 7-45 days) in the excision group ( $P = .001$ ). The stapled hemorrhoidopexy allowed a faster functional recovery with shorter time off work (weighted mean difference, -8.45 days;  $P < 0.00001$ ).

Comparison of Patient satisfaction score was done in the two groups (stapled  $=3.98 \pm 0.69$ , open  $=3.51 \pm 0.87$ ). Significantly higher satisfaction score were noted in patients in Stapled group with  $P=0.003^{**}$  by Mann Whitney U test. There is a high patient satisfaction rate reported with stapled hemorrhoidopexy even from the earliest studies.

No Major post operative complications were reported in our study.

Complete Circumferential Doughnut of the stapler line at the end of procedure was 93% in our patients. Supportive stitch was required in five patients. Post surgery six patients had bleeding as compared to 10 in the open group (13%, 22%). Urinary retention was also found to be higher in the open group. None in the stapled group had a residual prolapse. There was no incontinence in any group at 3 months. At 1 month , three patients in the open group reported incontinence to flatus and faeces. No report of incontinence in stapled group.

Jayaraman S, et al Cochrane Database Syst Rev. in 2006<sup>18</sup> on Stapled versus conventional surgery for hemorrhoids noted that though associated with comparable short term results, stapled hemorrhoido-pexy is associated with a higher long-term risk of hemorrhoid recurrence and the symptom of prolapse. The authors concluded that conventional excisional surgery remains the “gold standard” in the surgical treatment of internal hemorrhoids, if hemorrhoid recurrence and prolapse are the most important clinical outcomes.

However Tjandra JJ, Chan MK., (2007) systematic review stated that although there was increase in the recurrence of hemorrhoids at one year or more after stapled procedure the overall need of surgical and nonsurgical reintervention after the two procedures was similar. The conclusion was stapled hemorrhoidopexy is safe with many short-term benefits and the long-term results are similar to conventional procedure.

### Conclusion

The findings of our study confirm that stapled hemorrhoidopexy is associated with shorter duration of surgery, less postoperative pain and need for analgesia, shorter duration of hospital stay and a quicker recovery, earlier return to work and a high patient satisfaction as compared with Milligan Morganopen hemorrhoidectomy. The procedure is not associated with major post operative complications. There is no recurrence, residual prolapse or incontinence in the follow up period of six months.

We conclude that stapled hemorrhoidopexy is safe with many short-term benefits. It is a novel technique and has emerged as an alternative to open hemorrhoidectomy , long considered the “gold standard”.

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