



A COMPARATIVE STUDY BETWEEN OPEN AND STAPLER HAEMORRHOIDECTOMY

General Surgery

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ABSTRACT

Background and Aim: The word 'piles' is derived from the Latin word pila, meaning ball. It has traditionally been the layman's term for hemorrhoids, the treatment of which dates back almost 4000 years. Although there are many well-recognized precipitating factors associated with hemorrhoids such as low fiber intake, prolonged straining and pregnancy, the precise etiology remains unclear, which is certainly reflected in the number of treatment options available.¹ **Methodology:** A prospective comparative randomized study was carried which included 110 patients undergoing surgery for Hemorrhoids in Department of General & Minimal access surgery in Jaipur Golden Hospital. Out of 110 patients included in the study, 55 patients underwent open hemorrhoidectomy and 55 patients underwent Stapled hemorrhoidopexy. **Results:** Out of 110 patients included in the study, 55 patients underwent open hemorrhoidectomy and 55 patients underwent Stapled hemorrhoidopexy. The mean age of presentation was 39.16 ± 8.66 years. The age range observed was between 21 years to 65 years. In our study, most of the patients in the study had grade 4 hemorrhoids (64, 58.18%) followed by grade 3 hemorrhoids (41.82%). The proportion of patients with duration of stay up to 2 days was significantly higher in stapled hemorrhoidopexy patients as compared to open hemorrhoidectomy group (46.36% vs 23.636%). Open hemorrhoidectomy patients had significantly higher pain score at 6 hours, 12 hours and 24 hours post operatively. There was no significant pain score difference at day 7 amongst the two groups which was different from a study which showed that post-operative pain was tolerable (nonpersistent) in 28 (93%) cases whereas 2 (7%) experienced mild pain requiring additional analgesia. Patients undergoing stapled hemorrhoidopexy returned to work significantly earlier compared to the open hemorrhoidectomy patients (9.22 days vs 17.32 days). **Conclusion:** Stapled hemorrhoidopexy is a novel technique and in the laparoscopic era with advance of insurance policy system in INDIA, stapled hemorrhoidopexy may emerged as alternative to classical (open) hemorrhoidectomy. Treatment of grade II and grade III hemorrhoids with Stapled hemorrhoidopexy offers a safe and effective surgical alternative. The procedure has few post-operative complications, similar hospital stay and minimal perianal pain when compared to open hemorrhoidectomy.

KEYWORDS

Hemorrhoid Surgery, Stapled Hemorrhoidectomy, Milligan-Morgan

INTRODUCTION:

Haemorrhoids are defined as cushions of submucosal vascular tissue located in the anal canal starting just proximal to the dentate line. Hemorrhoidal disease occurs when there are symptoms such as bleeding, prolapse, pain, thrombosis, mucus discharge, and pruritus.²

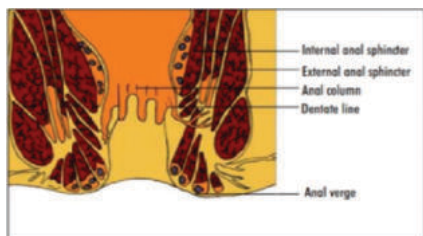


Figure 1: Anatomy of the Anal Canal

Figure 1 depicts the anatomical relationships of the components within the anal canal. The concept of anal cushions being the precursors of haemorrhoids was first introduced in 1975. Cushions were described in the classical 3, 7 and 11 o'clock positions.³

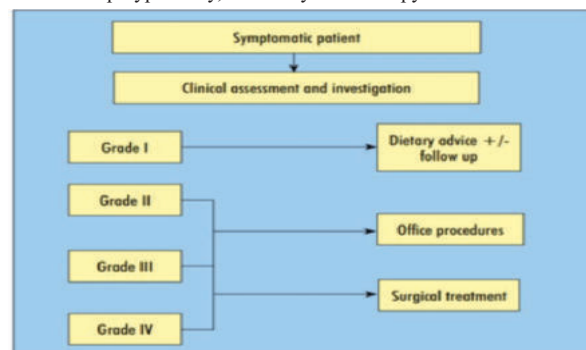
Hemorrhoids could be either external or internal. The former is congested aggregation of external vascular plexus of perianal area shielded by perianal skin. However, the later one is initiated from anal canal sub-epithelial plexus above dentate line.⁴

External hemorrhoids, third and fourth degree of internal hemorrhoids, and symptoms alleviation rubber band ligation failure should be treated with surgical hemorrhoidectomy.⁵ The Fergusson hemorrhoidectomy included anal mucosa complete closure with continuous absorbable suture through hemostasis and hemorrhoidal tissue.⁶ Milligan-Morgan open hemorrhoidectomy is utilized in cases where a completely closed wound is not required due to gangrenous hemorrhoids or ligation is the end of the procedure. Below the dentate line, the sensitive anoderm incorporates severe postoperative pains in both open and closed hemorrhoidectomy.⁷ Infrared photocoagulation, Milligan Morgan, Regularization of bowel function, Stapled hemorrhoidectomy, and Sclerotherapy are different treatment modalities for hemorrhoids. The most effective and commonly used surgical technique for hemorrhoids treatment is the Milligan Morgan.⁸

Diagnosis

The diagnosis of hemorrhoids is made after a careful clinical history, followed by anorectal examination. (Figure 2)

- Visual examination of the perianal skin will detect not only external but also prolapsed internal hemorrhoids.
- Digital examination of the rectum (DRE) and anal canal is mandatory, unless the patient has anal pain (which, in the absence of thrombosed hemorrhoids, is usually suggestive of anal fissure or perianal abscess).
- Rigid or flexible sigmoidoscopy and proctoscopy examination of the lower rectum and anal canal should be performed to exclude other significant disease, to confirm the diagnosis and to assess the hemorrhoids.
- Colonoscopy should be undertaken if the source of the bleeding is doubtful or if rectal and/or sigmoidoscopic examination suggests a higher lesion. Patients over 50 years of age with a family history of bowel cancer should undergo colonoscopy or flexible sigmoidoscopy, unless hemorrhoids can be unequivocally identified as the source of the bleeding.
- Barium enema is not as sensitive or specific as colonoscopy in the diagnosis of rectal bleeding, and lacks the therapeutic potential, such as polypectomy, offered by colonoscopy.



Patients with thrombosed hemorrhoids should have a digital and endoscopic examination of the rectum when the condition has resolved.

Important differential diagnoses are benign and malignant tumors, as well as anal fissure, perianal abscess or fistula, inflammatory bowel disease (IBD) (in particular, Crohn's disease) and rectal prolapse. The most important differential diagnosis is carcinoma of the rectum or anus. There is a strong temporal association between the diagnosis of benign anal conditions, such as hemorrhoids, and anal and colorectal cancer. This association is very unlikely to be causative and is almost certainly due to late diagnosis of malignant disease in patients with concurrent hemorrhoidal symptoms or to increased surveillance of patients with cancer. Actual cancer in a hemorrhoid is extremely rare.⁹

Figure 2 Stepwise management

Study Design: Prospective randomized comparative study.

Source of data:

110 patients undergoing surgery for Hemorrhoids in Department of General & Minimal access surgery in Jaipur Golden Hospital.

Inclusion criteria

The inclusion criteria for the study was -

1. Patients with either Grade 3 or grade 4 Haemorrhoids
2. Operated for haemorrhoids via Milligan Morgan haemorrhoidectomy or stapled hemorrhoidopexy
3. Age between 18 to 65 years

Exclusion criteria

Patients with pre-existing comorbidities like

1. Acute haemorrhoidal episodes with thrombosis
2. Prior haemorrhoidectomy
3. Intercurrent anal pathology (like fistula in ano and anal fissure) 4. Prolapse of single anal cushion
5. Anal stenosis

Aims and Objectives:

Aim and objectives

Aim

The main aim of the study was to assess and compare the short-term outcomes in patients undergoing Stapled hemorrhoidopexy with those in patients undergoing Milligan- Morgan hemorrhoidectomy.

Objectives

Primary objective –

The primary objective of the study was to compare Stapled hemorrhoidopexy with Milligan- Morgan hemorrhoidectomy in terms of post-operative pain and analgesia.

Secondary objective –

The primary objective of the study was to compare Stapled hemorrhoidopexy with Milligan- Morgan hemorrhoidectomy in terms of

1. Post-operative complications
2. Days taken for Return to Work
3. Anorectal physiological functions and recurrence
4. Patient satisfaction

METHODS:

Data would be collected using patient information sheets structured and validated for the study.

1. Baseline data was collected at the time of enrolment of the study which included age, gender, haemorrhoid grade, duration of study and the type of procedure that the patient has undergone along with duration of surgery and duration of hospital stay.
2. Post-operative pain was assessed using the visual analogue scale (VAS) with score of 0-10 (0 being no pain and maximum being the highest grade of pain experienced). Pain was assessed in the follow up period from 6 hours, 12 hours, 24 hours and day 7 along with time taken for complete resolution of the pain.
3. Patient follow up was done over the next month as a part of the routine visits and assessment of the time to return to work was done.
4. Patient satisfaction score on a scale of 0-5 was assessed (0 being not satisfactory at all and 5 being completely satisfied) at the follow up day 7.
5. Status of post-operative complications such as urinary retention, bleeding, supportive stitch, residual prolapse and post-operative pain at 1 month follow up was assessed.
6. Incontinence at 1st month and recurrence at 6th month was assessed at routine follow up visits for patients whose follow up

data was available.

7. A comparative analysis was done between the two groups for various parameters.

Age:

Age-related parameters comparison

The average of patients undergoing stapled hemorrhoidopexy was significantly higher than that of the patients undergoing open hemorrhoidectomy (41.06 vs 36.14, $P=0.0013$).

Table. Age related parameters of the study population

	Open hemorrhoidectomy	Stapled hemorrhoidopexy	Overall	P value
Total Number of patients	55	55	110	0.0013
Mean age in years	36.14	41.06	39.16	
Standard deviation	5.91	9.34	8.66	
Minimum	21	23	21	
Maximum	65	63	65	

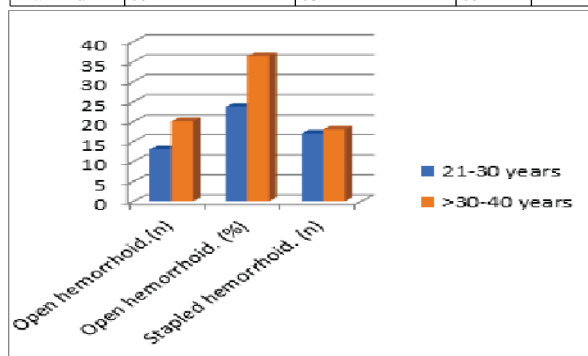


Figure. Age related parameter comparison of the study population

Age wise distribution of the study population was similar with no statistical difference between the two groups in any of the categories.

Table. Age wise distribution of the study population

Age wise distribution	Open hemorrhoid (n)	Open hemorrhoid (%)	Stapled hemorrhoid (n)	Stapled hemorrhoid (%)	P value
21-30 years	13	23.636	17	30.909	0.5281
>30-40 years	20	36.364	18	32.727	0.6894
>40-50 years	11	20	9	16.364	0.6222
>50-60 years	6	10.909	8	14.545	0.5685
More than 60 years	5	9.0909	3	5.4545	0.4643
Total	55	100	55	100	

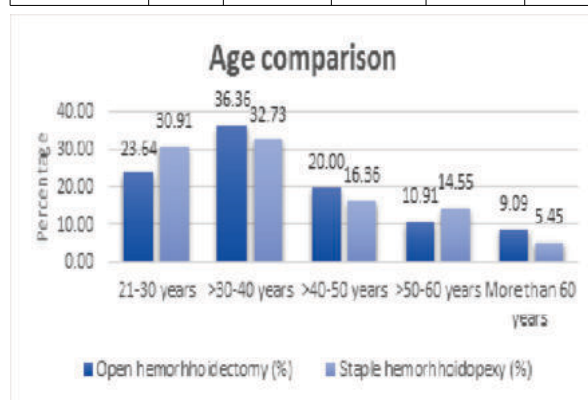


Figure. Age wise distribution of the study population

Grade of hemorrhoid distribution

The proportion of grade 4 hemorrhoids in open hemorrhoidectomy patients (61.81%) was slightly higher than that in the stapled

hemorrhoidopexy patients (54.54%). The distribution of grade of hemorrhoids across the two patient groups was not significantly different ($P=0.4417$).

Table. Grade of hemorrhoid-based distribution of the study population

Grade of hemorrhoid	Open (n)	Open (%)	Stapled (n)	Stapled (%)	P Value
Grade 3	21	38.182	25	45.455	0.4417
Grade 4	34	61.818	30	54.545	
Total	55	100	55	100	

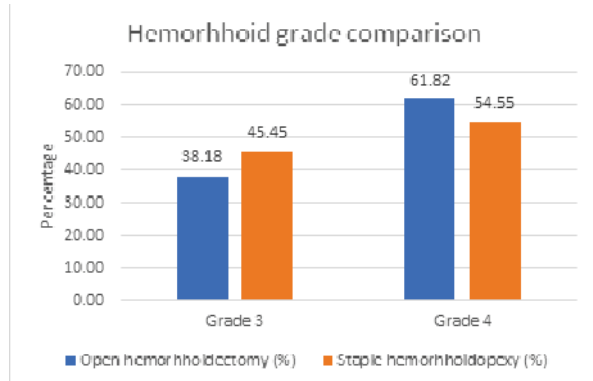


Figure. Grade of hemorrhoid-based distribution of the study population

Duration of surgery

The duration of surgery for stapled hemorrhoidopexy (45.39%) was higher than that for open hemorrhoidectomy patients (41.20%). This difference was not statistically significant ($p=0.1013$).

Table. Duration of surgery for the study population

	Open	Stapled	Overall	P value
Total Number of patients	55	55	110	0.1013
Mean duration of surgery (in minutes)	41.2	45.39	43.66	
Standard deviation	10.87	15.34	11.08	
Minimum	30	25	25	
Maximum	60	70	70	

Table. Hospital stay overall

	Open hemorrhoidectomy	Stapled hemorrhoidopexy	Overall	P value
Total Number of patients	55	55	110	0.0175
Mean duration of hospital stay (in days)	3.2	2.65	2.95	
Standard deviation	1.22	1.17	1.45	
Minimum	2	1	1	
Maximum	5	4	5	

The proportion of patients with duration of stay up to 2 days was significantly higher in stapled hemorrhoidopexy patients (46.36% vs 23.636%, $P=0.0271$).

Table. Hospital stay wise distribution of the study population

Duration of stay	Open (n)	Open (%)	Stapled (n)	Stapled (%)	P Value
Up to 2 days	13	23.636	24	43.636	0.0271
3-4 days	34	61.818	26	47.273	0.1273
More than 4 days	8	14.545	5	9.0909	0.3781
Total	55	100	55	100	

Post-operative pain (based on mean VAS)

Open hemorrhoidectomy patients had significantly higher pain score (3.33 vs 2.42) at 6 hours ($P<0.0001$), 12 hours ($P=0.0039$) and 24 hours ($P=0.0016$) post operatively. There was no significant pain score difference at day 7 amongst the two groups ($P=0.2112$).

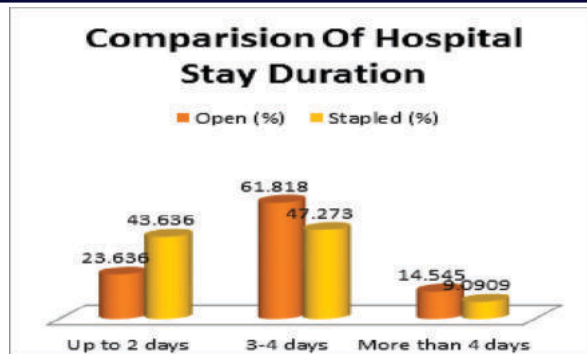


Figure. Hospital stay wise distribution of the study population

Table. Post-operative pain assessment in the study population

Post-operative pain (based on mean VAS)	Open hemorrhoidectomy	Stapled hemorrhoidopexy	Overall	P value
6 hours	3.331	2.42	2.91	<0.0001
12 hours	2.19	1.58	1.93	0.0039
24 hours	1.93	1.26	1.77	0.0016
7 days	1.11	0.98	1.01	0.2112

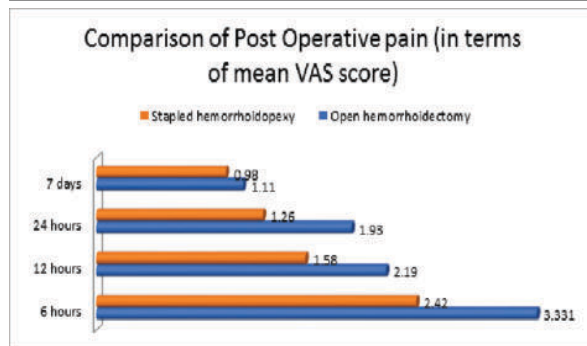


Figure. Post-operative pain assessment in the study population

Duration to return to work

Patients undergoing stapled hemorrhoidopexy returned to work significantly earlier compared to the open hemorrhoidectomy patients (9.22 days vs 17.32 days, $P<0.0001$).

Table. Duration of return to work

	Open hemorrhoidectomy	Stapled hemorrhoidopexy	Overall	P value
Total Number of patients	55	55	110	<0.0001
Mean duration to return to work (in days)	17.32	9.22	14.22	
Standard deviation	2.55	1.62	1.923	
Minimum	11	6	6	
Maximum	20	12	20	

Proportion of patients in stapled hemorrhoidopexy group who returned to work by 14th day was significantly higher compared to that for open hemorrhoidectomy patients (20% vs 0% for up to 7 days, $P=0.0005$, 65.45% vs 29.09% for 8-14 days, $P=0.0002$). Proportion of open hemorrhoidectomy patients returning to work after 14 days was 70.90% ($P<0.0001$).

Table. Distribution of study population as per duration of return to work

Duration to return to work	Open (n)	Open (%)	Stapled hemorrhoidopexy (n)	Stapled hemorrhoidopexy (%)	P value
Up to 7 days	0	0	11	20	0.0005
8-14 days	16	29.091	36	65.455	0.0002
>14 days	39	70.909	8	14.545	<0.0001
Total	55	100	55	100	

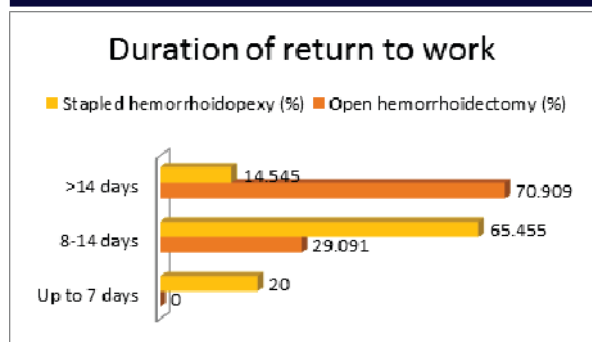


Figure. Distribution of study population as per duration of return to work

Patient satisfaction

The average patient satisfaction score was significantly higher for stapled hemorrhoidopexy patients (4.12 vs 2.97, $P < 0.0001$).

Table. Patient satisfaction assessment overall in the post-operative period

	Open	Stapled	Overall	P value
Total Number of patients	55	55	110	<0.0001
Mean patient satisfaction score	2.97	4.12	3.22	
Standard deviation	0.72	1.13	1.16	
Minimum	1	2	1	
Maximum	4	5	5	

The number of patients with satisfaction score 1 was significantly higher in the open hemorrhoidectomy group (34.54%) compared to stapled hemorrhoidopexy (5.45%) ($P < 0.0001$).

Table. Distribution of study population as per patient satisfaction score

Patient satisfaction score	Open (n)	Open (%)	Stapled (n)	Stapled (%)	P value
One	19	34.545	3	5.4545	0.0001
Two	24	43.636	29	52.727	0.5067
Three	6	10.909	14	25.455	0.0490
Four	3	5.4545	5	9.0909	0.4643
Five	3	5.4545	4	7.2727	0.6970
Total	55	100	55	100	

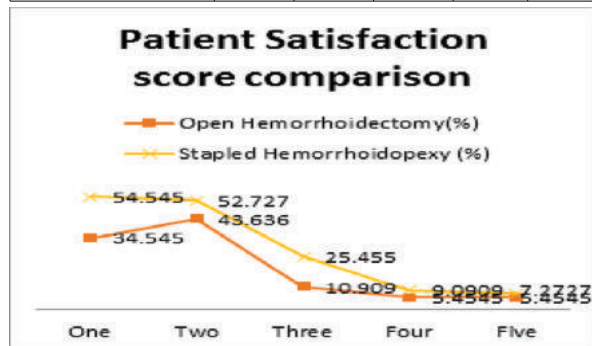


Figure. Distribution of study population as per patient satisfaction score

Post-operative findings/Complications

The proportion of patients with postoperative complications in stapled hemorrhoidopexy was lower for all complications compared to open hemorrhoidectomy. Only 2 cases of fecal incontinence were seen in the study, both occurring in the patients undergoing open hemorrhoidectomy. This difference was not statistically significant (0.1558).

Table. Post-operative findings in the study population

Post-surgery findings/Complications	Open (n)	Open (%)	Stapled (n)	Stapled (%)	P value
Urinary retention	12	21.818	4	7.2727	0.0313

Postoperative bleeding	14	25.455	6	10.909	0.0489
Supportive stitch	9	16.364	2	3.6364	0.0267
Residual Prolapse	26	47.273	11	20	0.0026
Post-Operative pain	41	74.545	23	41.818	0.0005
Fecal Incontinence	2	3.6364	0	0	0.1558

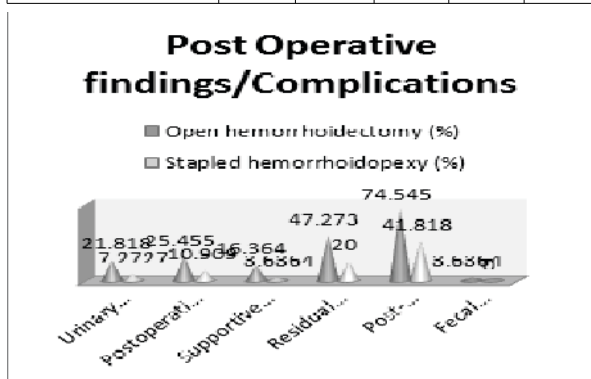


Figure. Post-operative findings in the study population

Follow up status

Incontinence at 1st month (9.9% vs 1.81%) and recurrence at 6th month (10.90% vs 1.81%) were higher in open hemorrhoidectomy group compared to stapled hemorrhoidopexy patients. The differences were not significant statistically ($P = 0.0941$, $P = 0.0518$).

Table. Follow up status evaluation

Follow up status	Open (n)	Open (%)	Stapled (n)	Stapled (%)	P value
Incontinence at 1st month	5	9.0909	1	1.8182	0.0941
Incontinence at 6th month	0	0	0	0	
Recurrence after 6th month	6	10.909	1	1.8182	0.0518

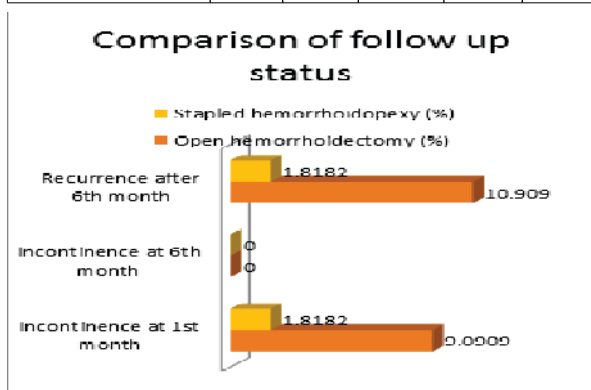


Figure. Follow up status evaluation

DISCUSSION

Hemorrhoids are a leading cause of lower gastrointestinal bleeding with a high impact on quality of life. The pathophysiology is multifactorial including: sliding anal cushion; hyper perfusion of hemorrhoid plexus; vascular abnormality; tissue inflammation; and internal rectal prolapse (rectal redundancy). The predisposing conditions to increased incidence of symptomatic hemorrhoids include state of elevated intra-abdominal pressure such as pregnancy and straining. Others known to contribute are weakening of the supporting connective tissue, smooth muscle, and vasculature from advancing age and activities such as strenuous lifting, straining with defecation, and prolonged sitting.¹⁰

Hemorrhoids are classified as internal or external based on the location from the dentate line. External hemorrhoids are located below, develop from ectoderm embryonically and are supplied by somatic nerves thus producing pain in strangulated and thrombosed piles. The Goligher system classifies hemorrhoids into four grades or degrees of prolapse; Grade 1 hemorrhoids do not prolapse outside the anal canal. In Grade

2, there is prolapse upon bearing down at defecation, but this retracts spontaneously; Grade 3 hemorrhoids prolapse on bearing down at defecation but require manual reduction. Finally, in Grade 4, there is a persistent non-reducible prolapsed hemorrhoid.

CONCLUSION

Our experience confirms the validity of both Open hemorrhoidectomy and Stapled hemorrhoidopexy. Open hemorrhoidectomy procedure is more invasive and slightly more painful in immediate postoperative period than Stapled hemorrhoidopexy. The procedure of Stapled hemorrhoidopexy is associated with less postoperative pain and early recovery in terms of post-operative wound healing with high patient satisfaction as compare to Open hemorrhoidectomy (Milligan-Morgan procedure). Moreover, patients undergoing staple hemorrhoidopexy returned to work significantly earlier compared to the open hemorrhoidectomy patients.

Complications in terms of urinary incontinence and postoperative rectal bleeding are less in staple hemorrhoidopexy and also if surgical technique is perfect with constant practice. To the safe side staple hemorrhoidopexy can be the gold standard for grade II & III hemorrhoids.

Staple hemorrhoidopexy is a novel technique and in the laparoscopic era with advance of insurance policy system in INDIA, staple hemorrhoidopexy may emerged as alternative to classical hemorrhoidectomy.

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