International Surgery Journal
Panigrahi SK et al. Int Surg J. 2018 Jan;5(1):209-215
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20175897

Original Research Article

Stapled hemorrhoidopexy versus Milligan-Morgan haemorrhoidectomy: a paradigm shift in the management of 3rd and 4th degree hemorrhoids

Sudhir Kumar Panigrahi, Chinmaya Ranjan Behera*, Subrajit Mishra, Abinash Kanungo

Department of Surgery, Kalinga institute of Medical Sciences, Bhubaneswar, Odisha, India

Received: 07 November 2017
Accepted: 02 December 2017

***Correspondence:**
Dr. Chinmaya Ranjan Behera,
E-mail: chinmayarbehera@gmail.com

ABSTRACT

Background: Hemorrhoids being a common anorectal problem with its well known morbidity and complications is treated since long by conservative measures, injection sclerotherapy or rubber banding for 1st and 2nd degree and by open Miligan Morgan hemorrhoidectomy or closed Fergusson hemorrhoidectomy for 3rd and 4th degree. However, since 1998, the adoption of Stapled Hemorrhoidopexy has proved over time to be a better alternative in terms of lesser postoperative complication and an overall patient satisfaction.
Methods: A prospective study conducted on 114 patients at Department of General Surgery, Kalinga institute of Medical Sciences, Bhubaneswar, Odisha from May 2014 to December 2016.
Results: Our study showed stapled hemorrhoidopexy, significantly reduced the time taken for the operative procedure ($p < 0.001$), post operative pain ($p < 0.01$), hospital stay along with early return to work and a better patient satisfaction.
Conclusions: Stapled hemorrhoidopexy is an effective alternative to open Miligan-Morgan procedure in treating 3rd and 4th degree hemorrhoids, in terms of lesser time taken for the operative procedure, post operative pain, use of analgesics, hospital stay and early return to work, better post operative patient's satisfaction and reduced procedure related complication.

Keywords: Hemorrhoid surgery, Miligan-Morgan hemorrhoidectomy, Stapled hemorrhoidopexy

INTRODUCTION

Hemorrhoids are among the commonest benign anorectal problem throughout the world and have been reported since the earliest history of man.

Hemorrhoids consist of vascular cushions maintained in position by the suspensory ligaments and are intimately involved in the maintenance of continence and discrimination between flatus and feces. Symptomatic hemorrhoids result from disruption of these ligaments permitting downward prolapse of the cushions into and beyond the anal canal during defecation. This prolapse results in constriction of the hemorrhoids between the fecal bolus and the ring of the sphincter mechanism. As a consequence, swelling due to vascular engorgement with a sensation of fullness and traumatic mucosal and endothelial breach results in bleeding per anum. The patients suffering from hemorrhoids can present with bleeding, prolapse, pain, perianal soiling and pruritus.

Hemorrhoids are classified according to location and degree of prolapse. Based on location, internal hemorrhoids arise proximal to the dentate line from the superior hemorrhoidal plexus and are covered by mucosa. Conversely, external hemorrhoids are located distal to the

dentate line, arise from the inferior hemorrhoidal plexus, and are covered by squamous epithelium. Mixed hemorrhoids (internal-external) are present above and below the dentate line and arise from the superior and inferior hemorrhoidal plexus and their anastomotic communications. Based on the degree of prolapse hemorrhoids are classified as follows:[1-3]

- *1st degree:* Cushions located above the pectinate line that do not descend upon straining and usually associated with bleeding during defecation.
- *2nd degree:* Cushions that protrude below the pectinate line during straining but return spontaneously to within the anal canal once straining stops.
- *3rd degree:* Cushions that protrude out of the anal canal during straining or defecation and require manual reduction back into the anal canal.
- *4th degree:* Cushions that are irreducible and remain constantly prolapsed independent of straining or defecation.

Treatment

Non-operative management are applied to 1st and 2nd degree hemorrhoids and include regular bowel habits, avoidance of neglecting the first defecatory urge, a high fiber diet, intake of bulk forming agents. A large variety of topical agents of unproven efficacy, but give symptomatic relief to some extent are in use such as creams, lotions, suppositories, and local anesthetics.

The use of sitz baths and warm soaks to ameliorate symptomatic hemorrhoids, especially thrombosis, and application of ice packs to decrease swelling shortly after it becomes evident have also been recommended. Minor surgical procedures usually done in the OPD or as day-care include injection sclerotherapy for 1st degree hemorrhoid or rubber band ligation for 2nd degree hemorrhoids. Manual dilatation of the anal canal under anesthesia, described by Lord in 1968, is no more practiced for the possibility of anal incontinence in up to 52% of patients.[4]

Surgical hemorrhoidectomy

Surgical hemorrhoidectomy should be considered mostly for 3rd and 4th degree internal hemorrhoids, external hemorrhoids and in cases of failure of rubber band ligation to alleviate symptoms.[5] All the patients were given two phosphate enemas, one on the night before and the other on early morning of surgery. Inj. Cefotaxime 1gm and Metronidazole 500mg was given I.V. to all at induction of anesthesia. The closed technique (Fergusson hemorrhoidectomy) involves complete closure of the anal mucosa with a continuous absorbable suture after the excision of the hemorrhoidal tissue and thorough hemostasis.[6]

Open hemorrhoidectomy of Miligan and Morgan is an option when the wound cannot be completely closed, as in the presence of circumferential or gangrenous hemorrhoids. The procedure ends after ligation of the pedicle. The mucosa and perianal skin are left open. Postoperative pain is moderate to severe in both the closed and open hemorrhoidectomy mostly due to the incorporation of the sensitive anoderm below the dentate line.[7]

Stapled hemorrhoidopexy

Devised by Longo in 1998 is also known as circular anopexy and stapled anoplasty.[8] It is applied to 3rd and 4th degree hemorrhoids. The procedure done under spinal anesthesia begins by introducing a circular anal dilator held in place by two lateral sutures with the perianal skin and introducing a semicircular purse string anoscope through the dilator.

A purse string taken through mucosa and submucosa at the level of 4cm to 5cm above the dentate line using a 2-0 polypropylene suture on a 5/8th needle. Head of the stapler is passed through the purse string before it is tightened around the shaft and then closed on the anvil with the interposed redundant mucosal tissue within the head of the gun. The tails of the purse string thread are brought out through each side channels with the help of a suture threader. By gentle traction on the sutures, the redundant mucosa is drawn into the head of stapler gun which is then positioned by the 4cm mark at anal verge and in line with the axis of the anal canal. The stapler head is tightened followed by the purse string suture around the shaft of the stapler. The stapler gun is then fired and held for 30 seconds with the resultant excised circular ring of about 3 cm of mucosa and submucosa. Then stapler is fully opened and withdrawn while bleeding from the staple line is checked. In females, exclusion of vagina in the purse string suture is ensured just prior to stapler firing by placing a finger in the vagina and checking for any dimpling or pulling of tissues into the stapler head. Post hemorrhoidopexy, in the distal rectum, the haemorrhoidal cushions are lifted back into their anatomical position and thus, reduces or prevents the constriction of the hemorrhoids by the sphincter mechanism during defecation. There is probably also reduction in blood flow into the cushions. Finally, as the tissues around the scar mature, the staple lines become fixed and tend to prevent prolapse of tissue. Larger controlled trials demonstrated that, stapled hemorrhoidopexy diminished postoperative pain when compared with conventional hemorrhoidectomy.[9-12] More-over, stapled hemorrhoidopexy is also associated with a shorter hospital stay and a faster return to full activity.[13]

Complications

Mostly occur due to technical errors such as repeated firing of staplers as a result of incomplete mucosal donut or incorporation of the rectovaginal septum. It is strongly

recommended that, in the event of identifying a very incomplete donut after firing of the stapling device, the staple line be carefully inspected and any defects repaired. No further attempts should be made to repeat the procedure with a new purse string and stapler at that stage. This finding is, in fact, unusual and it appears that problems are associated with ill-judged attempts to place further purse string sutures and use further stapling devices. In the relatively uncommon event of a poor result, the procedure can be repeated at a later stage. Life-threatening sepsis may be heralded by severe pelvic and lower abdominal pain together with urinary difficulties. Early imaging by way of computed tomography is recommended and an aggressive surgical policy including defunctioning and radical debridement recommended, particularly if tissue necrosis has developed. Fear of pain is the most important reason why patients avoid open hemorrhoidectomy and is preventable to a great extent by adoption of stapled hemorrhoidopexy. Currently, post hemorrhoidectomy pain is managed with analgesics and non-steroidal anti-inflammatory agents, stool softeners, and fiber supplement. Urinary retention is the most frequently seen complication with an incidence varying from 10% to 32% and the factors implicated in its causation are use of spinal anesthesia, fluid overload, rectal packing, rectal pain and spasm, and bulky dressings.[1,14]

Postoperative bleeding occurs in 2% to 4% cases and is frequently related to inadequate hemostasis or mass ligation of the hemorrhoid pedicle instead of suture ligature necessitating reoperation occasionally in about 0.8% to 1.3% cases.[14] Delayed hemorrhage (i. e. 7 to 14 days postoperatively) is probably a result of sepsis within the pedicle occurring in about 2% of hemorrhoidectomies and is usually not a preventable complication. The management of bleeding includes injection with epinephrine solution, direct pressure with or without topical epinephrine, and suture ligation. Other less frequent early complications include wound infection (<1%), fecal impaction, and external iliac vein thrombosis. Late complications can be found in up to 6% of hemorrhoidectomies. Anal fissure is the most common, accounting for 1% to 2.6%, followed by anal stenosis (1%).[14] Other concerns include incontinence (0.4%), anal fistula (0.5%), recurrent hemorrhoids (<1%), skin tags, ectropion, and mucosal prolapsed.[1,14]

METHODS

Study: This was a prospective study conducted at Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha. Duration of study was from May 2014 to December 2016.

Inclusion criteria

Patients presenting with 3rd and 4th degree hemorrhoids were subjected for open hemorrhoidectomy or stapled hemorrhoidopexy as per patient's preference.

Exclusion criteria

Acute hemorrhoidal episodes with thrombosis, prior hemorrhoidectomy and associated anal pathology (i.e. fistula and/or fissure).

Statistical analysis

Data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 10. Data are expressed in its frequency and percentage as well as mean and standard deviation. To elucidate the associations and comparisons between different parameters, Chi square (χ^2) test was used as nonparametric test and Student's t test was used to compare mean values between two groups. For all statistical evaluations, a two-tailed probability of value, <0.05 was considered significant.

RESULTS

The present study included the analysis of 114 cases, admitted in the surgical wards of Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha during the period from May 2014 to December 2016.

Table 1: Distribution of age in both the groups.

Age	Type of surgery	
	Stapled	Open
<30 yrs	5 (11.9%)	4 (8.3%)
30-39	12 (28.6%)	11 (22.9%)
40-49	12 (28.6%)	9 (18.8%)
50-59	8 (19%)	13 (27.1%)
60-69	2 (4.8%)	8 (16.7%)
≥70 yrs	3 (7.1%)	3 (6.3%)
Total	42	48

Table 2: Gender distribution in two groups.

Gender	Type of surgery	
	Stapled	Open
Male	28 (66.7%)	37 (77.1%)
Female	14 (33.3%)	11 (22.9%)
Total	42	48

Table 3: Duration of surgery in two groups.

Duration of surgery	Type of surgery	
	Stapled	Open
<20 min	4 (9.5%)	Nil
20-29	16 (38.1%)	Nil
30-39	22 (52.4%)	40 (83.3%)
≥40 mts	Nil	8 (16.7%)
Total	42	48

Chi square = 32.972; P <0.001

Out of these 114 cases, 16 had associated anal pathology and 8 cases had history of prior hemorrhoidectomy.

Hence these 24 cases were excluded from the study. A detailed history taking and a through clinical examination, which includes digital rectal examination and proctoscopy was carried out after admission.

Table 4: Pain score at 6 hrs in two groups.

Pain score at 6 Hrs	Type of surgery	
	Stapled	Open
Mild	8 (19%)	0
Moderate	32 (76.2%)	12 (25%)
Severe	2 (4.8%)	36 (75%)
Total	42	48

Chi square = 47.322; P <0.001

Table 5: Pain score at 24 hrs in two groups.

Pain score at 24 Hrs	Type of surgery	
	Stapled	Open
Mild	32 (76.2%)	4 (8.3%)
Moderate	10 (23.8%)	24 (50%)
Severe	0	20 (41.7%)
Total	42	48

Chi square = 47.353; P <0.001

Table 6: Pain score at 48 hrs in two groups.

Pain Score at 48 Hrs	Type of surgery	
	Stapled	Open
Mild	31 (23.8%)	20 (41.7%)
Moderate	11 (50%)	20 (41.7%)
Severe	0	8 (16.7%)
Total	42	48

Chi square = 12.642; P <0.01

Apart from routine preoperative investigations sigmoidoscopy or colonoscopy were carried out whenever indicated. Informed consent was taken prior to surgery and the cases were divided into two groups as per the operation: SH (stapled hemorrhoidopexy) group included 42 cases and MM (Miligan Morgan) group included 48 cases.

Table 7: Analgesic administration for stapled hemorrhoidectomy.

Analgesic administration for staple	Duration after surgery		
	6 Hrs	24 Hrs	48 Hrs
Step I	0	32 (76.2%)	42 (100%)
Step II	36 (85.7%)	10 (23.8%)	0
Step III	6 (14.3%)	0	0

Chi square = 96.071; P <0.001

All patients underwent operation under spinal anesthesia. The operative timing and any intra-operative complication was noted. The patients were followed up in the post operative period and up to 3 months after discharge from the hospital. Post operative pain was managed according to the guidelines of the French Anaesthesiology Society.

Table 8: Analgesic administration for open hemorrhoidectomy.

Analgesic administration for open	Duration after surgery		
	6 Hrs	24 Hrs	48 Hrs
Step I	0	6 (12.5%)	16 (33.3%)
Step II	18 (37.5%)	32 (66.7%)	24 (50%)
Step III	30 (62.5%)	10 (20.8%)	8 (16.7%)

Chi square = 40.318; P <0.001

Table 9: Urinary retention in two groups.

Urinary Retention	Type of surgery	
	Stapled	Open
Present	28 (66.7%)	32 (66.7%)
Absent	14 (33.3%)	16 (33.3%)
Total	42	48

Chi square = 0.051; P >0.05

Table 10: Comparative analysis of postoperative bleeding in both groups.

Bleeding	Type of surgery	
	Stapled	Open
Absent	41 (97.6%)	46 (95.8%)
Present	1 (2.4%)	2 (4.2%)
Total	42	48

Chi square = 0.038; P >0.05

Table 11: Comparative analysis of pain in two groups and association of pain with type of surgery in follow up period.

Pain	Type of surgery	
	Stapled	Open
Mild	28 (66.7%)	10 (20.8%)
Moderate	14 (33.3%)	32 (66.7%)
Severe	0	6 (12.5%)
Total	42	48
Chi square = 21.264; P <0.001		

Pain was assessed using a visual analogue scale (VAS) in which 0 corresponds to “no pain” and 10 to “maximum pain”. The aim was to keep the pain down to a VAS score of less than 3 at all times. Other parameters evaluated were length of hospital stay, post-operative complications and whether there were recurrences.

Gender distribution in Table 2 shows a male: female ratio of 2:1 for the SH group and 3.4:1 for the MM group respectively.

DISCUSSION

Stapled hemorrhoidopexy as developed by Lonogo A with use of a circular stapler, has emerged as a possible alternative to open hemorrhoidectomy.[15] The indications, contraindications and operative technique have been defined. Numerous controlled studies have already demonstrated that this technique is associated with less postoperative pain, quicker recovery and an early return to work. Most of these studies were conducted in highly specialised centres. Present objectives were to find out if the results of the stapled hemorrhoidopexy are the same as those reported in the available literature and earlier studies.

Table 12: The mean values are significantly lower in the SH group than that of the MM group for all the parameters like duration of surgery, duration of hospital stay, pain score at 6, 24 and 48 hours of surgery.

Parameters	Type of Surgery	Mean	+ SD	t value	p value
Age (Years)	Stapled	44.62	13.00	- 1.409	>0.05
	Open	48.79	14.84		
Duration of surgery (minutes)	Stapled	28.07	5.30	-6.310	<0.001
	Open	34.25	3.96		
Duration of hospital stay (days)	Stapled	2.08	0.71	-12.740	<0.001
	Open	4.29	0.93		
Pain Score at 6 Hrs	Stapled	4.14	0.85	-8.148	<0.001
	Open	7.52	0.94		
Pain Score at 24 Hrs	Stapled	3.42	0.76	-3.321	<0.01
	Open	5.53	0.83		
Pain Score at 48 Hrs	Stapled	2.22	0.42	2.973	<0.01
	Open	4.45	0.59		

Bleeding in the postoperative period

Out of 42 cases in SH group, 1 case i.e. 2.4% had post-operative bleeding and was due to small defect in the staple line, which was controlled by two or three absorbable hemostatic sutures. In MM group 2 cases (4.2%) had post-operative bleeding at the ligated pedicles that was controlled by resuturing (p >0.05). This complication is well in comparison with other studies.[16,17]

Duration of surgery

Stapled hemorrhoidopexy was significantly faster than the Milligan-Morgan technique (28 minutes versus 34 minutes; p<0.001). This is found similar to the results of other studies.[12,18-20]

Pain score

Significant level of pain score, were seen at all times in MM group versus SH group (i.e. p value at 6hrs <0.001, at 24hrs <0.01 and at 48hrs <0.05). First postoperative day pain is significantly less in several studies conducted previously.[10,14,21] Even the analgesic requirement in the MM group was high as compared to SH group and it well correlates with earlier observers.[22] However, a purse string suture placed too close to the Dentate line or a low placed staple line can be the cause for persistent postoperative pain in the SH group.[23,24]

Length of hospital stay. Length of hospital stay was significantly shorter in SH group (2.08 days versus 4.29 days. This supports earlier study by Chalkoo and other observers.[10,13,25]

Complications

Complications following surgical haemorrhoidectomy are frequently related to surgical technique and issues of postoperative management. In the present study patients were followed up postoperatively till 3 months.14 Urinary retention was the most frequently seen complication in 66.70% of patients in both group and the reasons could be spinal anesthesia, fluid overload, rectal packing, rectal pain and spasm and bulky dressings. Similar results were obtained by Baliga et al, though to a lesser frequency of 20%.[16]

Two cases of MM group had postoperative bleeding i.e., delayed haemorrhage probably as a result of sepsis within the pedicle and was managed with readmission, direct pressure, and suture ligation. One case of SH group had mild persistent bleeding during follow up, that revealed granulomas with few residual staples and resolved after staple removal. One case in SH group had persistent sensation of urgency and tenesmus lasting for one month which responded well to oral nifedipine. Other observers are of the similar opinion of a reduced postoperative complications in the SH group.[14,26]

Two cases in MM group had anal fissure which was treated conservatively. None of the patients in the present study had fecaloma, fecal incontinence, anal stenosis, recurrent haemorrhoids or mucosal prolapse during 3 months of follow up. No mortality was observed in our study.

From the above findings in our study, stapled hemorrhoidopexy can thus be considered as a safe, reliable and better surgical procedure as compared to open Miligan Morgan technique in treating 3rd and 4th degree haemorrhoids.[27]

Many of present results are influenced by the socioeconomic status of the study population, poor health awareness and inadequacies of the health care system. However, most of the results obtained were comparable with the currently available literature.

ACKNOWLEDGEMENTS

Authors would like to thank Prof. (Dr.) Viyatprajna Acharya for providing comments and her statistical assistance that greatly helped the manuscript.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Corman ML. Hemorrhoids. In: Corman ML, editor. Colon and rectal surgery. 4th edition. Philadelphia: Lippincott-Raven; 1998:147-205.
2. Nivatvongs S. Hemorrhoids. In: Gordon PH, Nivatvongs S, editors. Principles and practice of surgery for the colon, rectum, and anus. 2nd edition. St. Louis: Quality Medical Publishing Inc.; 1999:193-215.
3. Standards Task Force. American Society of Colon and Rectal Surgeons. Practice parameters for the treatment of hemorrhoids. Dis Colon Rectum. 1993;36:1118.
4. Konsten J, Beaten CGMI. Hemorrhoidectomy vs. Lord's method: 17-year, follow-up of a prospective, randomized trial. Dis Colon Rectum. 2000;43:503.
5. Cintron JR, Abcarian H. Benign anorectal: Hemorrhoids. The ASCRS textbook of colon and rectal surgery. Springer; 2007:156-177.
6. Hayssen TK, Luchtefeld MA, Senagore AJ. Limited hemorrhoidectomy: results and long-term follow up. Dis Colon Rectum. 1999;42:909-15.
7. MEllabban G.Stapled Hemorrhoidectomy versus traditional hemorrhoidectomy for the treatment of hemorrhoids. World J Colorect Surg. 2010;2(1).
8. Longo A. Treatment of hemorrhoidal disease by reduction of mucosa and hemorrhoidal prolapse with circular suturing device: a new procedure. In: Mundozzi, editor. 6th World Congress of Endoscopic Surgery. Rome; 1998:777-784.
9. Ho YH, Cheong WK, Tsang C, Ho J, Eu KW, Tang CL et al. Stapled hemorrhoidectomy - cost and effectiveness. Randomized, controlled trial including incontinence scoring, anorectal manometry, and endoanal ultrasound assessments at up to three months. Dis Colon Rectum. 2000;43:1666-75.
10. Shalaby R, Desoky A. Randomized clinical trial of stapled versus Milligan-Morgan haemorrhoidectomy. Br J Surg. 2001;88:1049-53.
11. Boccasanta P, Capretti PG, Venturi M, Cioffi U, De Simone M, Salamina G, et al. Randomised controlled trial between stapled circumferential mucosectomy and conventional circular hemorrhoidectomy in advanced hemorrhoids with external mucosal prolapse. Am J Surg. 2001;182(l):64-8.
12. Ganio E, Altomare DF, Gabrielli F, Milito G, Canuti S. Prospective randomized multicentre trial comparing stapled with open haemorrhoidectomy. Br J Surg. 2001;88:669-74.
13. Molloy RG, Kingsmore D. Life threatening pelvic sepsis after stapled hemorrhoidectomy. Lancet. 2000;355:810.
14. Beck DE. Hemorrhoidal disease. In: Beck DE, Wexner SD, editors. Fundamentals of anorectal surgery. 2nd editon. London: W.B. Saunders Co.; 1998:237-53.
15. Kohlstadt CM, Weber J, Prohm P. Stapler hemorrhoidectomy. A new alternative to conventional methods. Zentralbl Chir. 1999;124:238-43.
16. Baliga K, Chetty DV. Stapler hemorrhoidectomy versus open hemorrhoidectomy. Int Surg J. 2016 Nov;3(4):1001-905.
17. Ashwani K, Manisha A, Lal RS, Tarun K, Sunita GOpen (Miligan Morgan) hemorrhoidectomy versus stapled hemorrhoidopexy: A comparative study. Br J Med Med Res. 2017;21(12):1-7.
18. Ng KH, Ho KS, Ooi BS, Tang CL, Eu KW. Experience of 3711 stapled Haemorrhoidectomy operations. Br J Surg. 2006;93:226-230.
19. Khalil KH, O'Bichere A, Sellu D. Randomized clinical trial of sutured Versus stapled closed haemorrhoidectomy. Br J Surg. 2000;87:1352-5.
20. Lan P, Wu X, Zhou X, Wang J, Zhang L. The safety and efficacy of stapled hemorrhoidectomy in the treatment of hemorrhoids: A systemic review and meta analysis of ten randomized control trials. Int J Colorectal Dis. 2006;21:172-8.
21. Kirsch JJ, Staude G, Herold A. The Longo and Milligan-Morgan hemorrhoidectomy. A prospective comparative study of 300 patients. Chirurg. 2001;72:180-5.
22. Carapeti EA, Kamm MA, McDonald PJ, Phillips RK. Double-blind randomized controlled trial of effect of metronidazole on pain after day-case haemorrhoidectomy. Lancet. 1998; 351:169-72.

23. Seow-Choen F. Stapled hemorrhoidectomy; pain or gain. Br J Surg. 2001;88:1-3.
24. Cheetham MJ, Mortensen NJM, Nystom PO, Kamm MA, Phillips RKS. Persistent pain and faecal urgency after stapled haemorrhoidectomy. Lancet. 2000;356:730-3.
25. Chalkoo, M, Ahangar S, Awan N, Dogra V, Mushtaq U, Makhdoomi H. An early experience of stapled hemorrhoidectomy in a medical college setting. Surgic Sci. 2015;6:214-20.
26. Chalkoo M, Okumura K, Otieno ES. Open (Miligan Morgan) haemorrhoidectomy versus stapled haemorrhoidepexy: a comparative study. Br J Medic Med Res. 2017;21(12):1-7.
27. Atomizing Hemorrhoids. Available at: www.proctology.us/atomizing.php. Accessed on 10th July 2010.

Cite this article as: Panigrahi SK, Behera CR, Mishra S, Kanungo A. Stapled hemorrhoidopexy versus Milligan-Morgan haemorrhoidectomy: a paradigm shift in the management of 3rd and 4th degree hemorrhoids. Int Surg J 2018;5:209-15.