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ORIGINAL RESEARCH

Laser Haemorrhoidoplasty versus Conventional Haemorrhoidectomy for grade II/III Haemorrhoids

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ABSTRACT

Aim: This study is Aimed to compare these procedures Conventional Haemorrhoidectomy and Laser Hamorrhoidoplasty in Grade II/III Haemorrhoids .

Study Design: Methodology Collect the data of 50 patients with grade II-III Haemorrhoids were allocated to two groups: Conventional Haemorrhoidectomy (CH) and Laser haemorrhoidoplasty (LH) with 25 patients in each group. Results were compared and patients were followed up for minimum period of 3 months.

Results The mean operative time was 30 min (LH) and 40 min (CH) (P =.124). The average blood loss was 6.32 ml (LH) and 12.64 ml (CH) (P 8, requiring longer hospital stay, 2 (6%) had bleeding on the same day, 1 (4%) had bleeding on follow up and 1 (4%) had recurrence.

Conclusion In terms of early postoperative pain and complications, LH offers better results as compared to CH. It was associated with a shorter hospital stay and early return to work. No significant complications were noted in LH compared to CH. LH is an extremely viable alternative to the popular CH for grade II-III haemorrhoids.

Keywords Laser haemorrhoidoplasty (LH) , Conventional Haemorrhoidectomy (CH) , Grade II/III Haemorrhoids , Haemorrhoids , Stapler Haemorrhoidectomy .

Introduction

Hemorrhoidal disease is ranked first amongst diseases of the rectum and large intestine, and the estimated worldwide prevalence ranges from 2.9% to 27.9%, of which more than 4% are symptomatic . Approximately, one third of these patients seek physicians for advice. Age distribution demonstrates a Gaussian distribution with a peak incidence between 45 and 65 years with subsequent decline after 65 years . Around half of the population has some degree of affection by the age of 50 years. Men are more frequently affected than women .[1]Haemorrhoids are defined as the symptomatic enlargement and distal displacement of the normal anal cushions. Multiple factors have been claimed to be the etiologies of hemorrhoidal development, including constipation and prolonged straining. The most common symptom of Haemorrhoids is rectal bleeding associated with bowel movement. The abnormal dilatation and distortion of the vascular channel, together with destructive changes in the supporting connective tissue within the anal cushion, is a paramount finding of Haemorrhoids. It appears that the

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dysregulation of the vascular tone and vascular hyperplasia might play an important role in hemorrhoidal development, and could be a potential target for medical treatment. In most instances, Haemorrhoids are treated conservatively, using many methods such as lifestyle modification, fibre supplement, suppository-delivered anti-inflammatory drugs, and administration of venotonic drugs.[2] Non-operative approaches include sclerotherapy and, preferably, rubber band ligation. An operation is indicated when non-operative approaches have failed or complications have occurred. This article firstly reviewed the pathophysiology and other clinical backgrounds of hemorrhoidal disease, followed by the current approaches to non-operative and operative management. Excisional Haemorrhoidectomy is the most effective treatment for Haemorrhoids with the lowest rate of recurrence compared to other modalities. It can be performed using scissors, diathermy, or vascular-sealing device such as Ligature (Covidien, United States) and Harmonic scalpel (Ethicon Endosurgery, United States).[3]Excisional Haemorrhoidectomy can be performed safely under perianal anaesthetic infiltration as an ambulatory surgery. Indications for Haemorrhoidectomy include failure of non-operative management, acute complicated Haemorrhoids such as strangulation or thrombosis, patient preference, and concomitant anorectal conditions such as anal fissure or fistula-in-ano which require surgery. In clinical practice, the third-degree or fourth-degree internal Haemorrhoids are the main indication for Haemorrhoidectomy.[4] Several surgical approaches for treating Haemorrhoids have been introduced including Haemorrhoidectomy and stapled haemorrhoidopexy, but postoperative pain is invariable. Some of the surgical treatments potentially cause appreciable morbidity such as anal stricture and incontinence. Surgery is the most effective treatment for Haemorrhoids and is particularly recommended in prolapsing piles during defecation that may be reduced manually (Grade III) and irreducible Haemorrhoids (Grade IV) . Other indications to surgery are failure of non-operative management, patient preference and concomitant conditions (such as fissure or fistula) that require surgery . [5]The rationale of these procedures is based on the theory that Haemorrhoids are caused by vascular hyperplasia of the arteriovenous network within the anorecta ligation of the bleeding vessel solves the problem. Late bleeding, 7 to 10 days after surgery, occurs when the necrotic mucosa overlying the vascular pedicle sloughs. Some patients can be managed observantly, while some will require examination under anaesthesia and ligation of bleeding vessel.[6] A major drawback of Haemorrhoidectomy is bleeding, warranted inspection of the wound and if required return to the theatre. postoperative pain. There has been evidence that Ligature Haemorrhoidectomy results in less postoperative pain, shorter hospitalization, faster wound healing and convalescence compared to scissors or diathermy Haemorrhoidectomy Other postoperative complications include acute urinary retention (2%-36%), postoperative bleeding (0.03%-6%), bacteraemia and septic complications (0.5%-5.5%), wound breakdown, unhealed wound, loss of anal sensation, mucosa prolapse, anal stricture (0%-6%), and even faecal incontinence (2%-12%). Recent evidence has suggested that hemorrhoidal specimens can be exempt from pathological examination if no malignancy is suspected.[7,8]

MATERIALS AND METHODS

It is a prospective comparative study in which patients getting operated for Haemorrhoids either using Stapler Haemorrhoidectomy or Laser Haemorrhoidoplasty technique.

Inclusion criteria:

- Symptomatic Grade II and III Haemorrhoids
- Age 18 years to 75 years.

Exclusion criteria:

- Grade I and IV Haemorrhoids
- Acutely thrombosed Haemorrhoids
- Concurrent acute anorectal diseases
- Previously operated cases

Methodology

The study was conducted for Comparison of qualitative parameters between the two groups was done using chi-square test with 95% considered significant. Comparison of qualitative parameters between the two groups was done using chi-square test with 95% confidence interval (CI) and P values less than 0.05 were considered significant. Pearson's correlation table was used to identify the variables which significantly affect the outcome in the haemorrhoid surgeries.

Stapler Haemorrhoidectomy

Stapler Haemorrhoidopexy was performed by using a specifically-designed 3 rows circular stapling device, The operation was performed in the standard extended lithotomy position.

Laser Hemorrhoidoplasty Laser Haemorrhoidoplasty was performed using a Diode Laser with bare Optical Fibre emitting 1470-nm LASER, delivering pulses at a fixed interval. The procedure was repeated at all the Haemorrhoids in the other two positions. In both the above groups, any external Haemorrhoids or redundant prolapsing tissue was excised using closed technique. Postoperative analgesia. Any persistent pain or

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RESULTS

There were 50 patients enrolled in this study. They were allocated to two groups, 25 each in LH (Laser Haemorrhoidoplasty) group and SH (Stapler Haemorrhoidopexy) group. The mean age of patients was 50 years with minimum age 28 years and maximum age 62 years. There were 40 males (80%) and 10 females (20%). Most common presenting symptom was tissue prolapse per rectum in 40 (80%) patients. The other symptoms were bleeding per rectum in 32 (65%), constipation in 24 (45%), pain during defecation in 18 (33%) patients. internal Haemorrhoids while 9 patients (16%) had grade II internal Haemorrhoids. 10 patients (20%) had some degree of external Haemorrhoids and 7 (14%) had skin tag. Examination during surgery revealed active bleeding in 9 patients (21%) and mucosal prolapse in 18(40%). Spinal anaesthesia was preferred and 48 patients underwent procedures under spinal anaesthesia while 2 patients were operated under general anaesthesia due to medical conditions. On examination, majority of them, 42 patients (84%) had grade III .

	Mean±SD (standard deviation)							
	Age (years)					51.08±15.105		
				n			**n%**	
	Male			40			80	
	Female			10			20	
	Symptoms							
	Pain			18			33	
	Bleeding			32			65	
	Constipation			24			45	
	Prolapse			40			18	
	Co-Morborbidities			15			33	
	Examination							
	Skin Tags			6			13	
	Ext Piles			9			21	
	Grade Of Piles							
	II			8			16	
	III			42			84	
	Active Bleeding			10			20	
	Mucosal Prolapese			23			44	

Table 1: Demographics

Comparing Surgical Groups

Demographics The two groups: LH (laser hemorrhoidoplasty) and SH (stapler hemorrhoidopexy) were compared using independent t-test for quantitative parameters and chi-square test for qualitative parameters. They were compared to see if there was significant difference between their demographics. There was no significant age difference between the groups. However, LH group had 95% males and 4% females, while the SH group had 64% males and 36% females, the difference was statistically significant. Both the surgical groups were fairly comparable in their presenting symptoms and the examination findings.

			L Group			**SH Group**				
	Age (Years)		**Mean**	**SD**		**Mean**	**SD**		**P Value**	
			46.4	14.2		52.7	12.7		0.6	
	Symptoms		n	%		n	%			
	Male		25	95		15	65		0.5	
	Female		1	5		10	35			

Table 2: Comparing surgical groups: Demographics

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				LH Group			SH Group		P Value	
				n	%		n	%		
	Symptoms									
	Pain			8	32		9	36	0.76	
	Bleeding			12	48		21	84	0.7	
	Constipation			13	52		10	40	0.39	
	Prolapse			18	72		22	88	0.15	
	Co-Morborbidities			9	36		7	28	0.54	
	Examination									
	Skin Tags			3	12		4	16	0.68	
	Ext Piles			6	24		4	16	0.48	
	Active Bleeding			3	12		7	28	0.15	
	Mucosal Prolapese			12	48		10	4	0.56	

Table 3. **Comparing surgical groups: Demographics**

Only one parameter was significantly different, the bleeding per rectum as a symptom. However, on examination, the active bleeding was present in both the groups and had no significant difference. The mean operative duration in LH was 24.6 min and in SH was 28.6 min, which was not statistically different. The blood loss was 8.32 ml in LH and 11.64 ml in SH, which was significantly more in the SH group (P =.011). The mean hospital stay was 21.44 hours in LH and 32.64 hours in SH, which was significantly better in LH group (P =.007). 4 patients in the LH group were discharged the same evening (stay of 8 hours) while the others were discharged the next day. In the SH group, six patients had more than 1 day of hospital stay. The maximum stay was for The maximum stay was for 4 days in a 35 years old gentleman who had severe post operative pain (VAS score 10) and required consultation of Pain Management Team. He was managed conservatively with centrally acting analgesic, gabapentin. One patient had three days stay due to severe postoperative pain (VAS score 9) requiring intravenous analgesics. Four other patients had two days of stay due to postoperative pain (VAS>7) requiring intravenous analgesics and one of them had urine retention postoperatively requiring catheter for longer time (5 weeks). All these patients belonged to the stapler group. Postoperative pain was a significant clinical outcome. The mean pain score VAS at 12 hours and 24 hours postoperatively was 2.64 and 1.88 in LH group and 4.76 and 3.6 in SH group. The LH group had significantly better outcome in terms of less pain score VAS in the first 24 hours. The mean pain score VAS at 1 week and 3 months was 0.36 and 0.04 in LH and 0.88 and 0.12 in SH. Even though at 1 week, the LH group had less pain score, no significant difference was noted in the 1 week or 3 months pain scores in both the groups. Complications within first week were seen in 6 patients (12%). One patient in the LH group, came on the fourth postoperative day with bleeding and was readmitted. He was managed with laxatives and observation. In the SH group, two patients had severe pain which required consultation from Pain Management Team and were managed with gabapentin, as described above. Three patients (6%) had postoperative. bleeding, two of them had bleeding on the same evening, required re-exploration. No active bleeding was seen and clots were evacuated. Complications were noted on follow up in 3 patients (6%). One patient from the stapler group, came after 11 months with bleeding per rectum and recurrent grade I piles on colonoscopy. One patient from the stapler group came at 6 months with bleeding per rectum and was managed conservatively. One patient who had urine retention, as described above, from the stapler group came on follow up at 1 month with pain during defecation. The catheter was removed and he was managed conservatively with laxatives and sitz bath. Within the first week, only one patient in the LH group (4%) had complication. He presented with bleeding on the 4th postoperative day, as described above. Whereas, in the SH group, 7 patients (28%) had some postoperative event. On follow up, there were 3 complications and all in the SH group (12%). Statistically, the LH group fared significantly better than the SH group in terms of complications within 1 week and even on longer follow up. As seen in the above table, sex affected the VAS score at 24 hours, however the correlation coefficient is weak, only 35%. Bleeding during the surgery also affected the VAS score at 24 hours and the chances of complications within 1 week, but with weaker coefficients, 29.5% and 31.3% respectively. The grade of piles affected the blood loss to an extent of 32%. Significant correlation was seen between operative time and blood loss (51.3%); also seen between operative time and hospital stay, 12 hour

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VAS and 24 hour VAS but the coefficients were weaker. Five patients underwent mucopexy in the LH group and 20 patients did not. The 12 hour VAS was slightly more in the mucopexy patients; however no significant difference was noted between them. It is likely that the sample size in mucopexy group is very small and both the groups are not exactly comparable which invalidates the statistics.

DISCUSSION

Currently, several therapeutic modalities are available for the treatment of haemorrhoids. It largely depends on the severity and location of the haemorrhoids. Low grade (grade II) haemorrhoids are usually managed by non invasive methods like Rubber-Band Ligation (RBL). The RBL procedure can be performed in an outpatient setting (may require several sittings), is considered safe, preferred by patients and yields a success rate of 70-97% . Doppler technology to identify and ligate 3-6 hemorrhoidal vessels has shown to result in lower recurrence rates than RBL, yet its association to increased postoperative pain and being an invasive procedure it is not practiced widely. For grade III prolapsing haemorrhoids, excision has been considered the standard of treatment. With the advent of stapler hemorrhoidal procedure, the ease of availability of stapler devices, the variety of options available and increasing expertise in the technique, the current era has seen the stapler procedure being performed at an increasing rate in the last decade. [9,10]However, even the stapler procedure is not free from complications. Postoperative pain has always been a fear-factor in patients with haemorrhoids. Pain is the major concern, which makes patients reluctant to undergo surgical procedure novel procedure, which has improved the immediate postoperative outcomes when compared to conventional haemorrhoidectomy.[11,12] The long term results of stapler are still far from satisfactory and the search of the ideal treatment procedure continues. Hemorrhoidal Laser Procedure (HeLP) as a novel doppler-guided procedure using a special laser device to shrink terminal branches of the superior hemorrhoidal artery. The procedure has been described for the treatment of second and third degree haemorrhoids. It is intended to accelerate postoperative downstaging of the haemorrhoids. Spontaneous resolution is noted after several days.[13] The procedures with operation duration mean 20.8 minutes. Postoperative pain was noted to be VAS 0 in 80.6% patients at the first defecation, VAS 0 in 82.3% patients at 1 week and VAS 0 in 95.2% at 1 month. Other complications noted were bleeding (2.4–6%), abscess (0-5%) and urine retention in 20.1%. Long term complications include fissure (1-2.6%), anal stenosis (1%), incontinence (0.4%), fistula (0.5%). Present study showed similar results. Mean postoperative VAS score was 1.88 at 1 day, 0.36 at 1 week and 0.04 at 3 months. There was only 1 event of bleeding within first week (4%). Laser dearterialization has the advantage of preservation of the anatomy and physiology of the anal canal, when compared to other forms of treatment. Thus, it minimizes the risk of postoperative impaired anal function. As the technique spares the sensitive region below the dentate line, the pain in the postoperative period is very less when compared to other methods. Incidence of postoperative bleeding is also lesser compared to other methods. It may not require anaesthesia for the procedure; however, regional anaesthesia is preferred to allay the patient. hemorrhoidal tissue submucosally and thus downgrades the disease. The entry to the hemorrhoidal pedicle is achieved via 2 mm small nick at mucocutaneous junction wherein the pointed laser probe is inserted submucosally until it has reached the area underneath the distal anal mucosa.[14] After application of laser pulses, the tissue's response can be seen as slight reduction, but the better contraction response is seen later on follow-up. For patients with symptomatic or significant mucosal prolapse, a short distance mucopexy can be added, above the dentate line. However, the comparative results and complications related to mucopexy need to be studied. In our comparative analysis, we found that both stapler haemorrhoidectomy and laser haemorrhoidoplasty are safe and effective procedures for haemorrhoids.[15] However, significant difference was noted in the operative blood loss and outcome parameters like hospital stay, immediate postoperative VAS and complications. The operative bleeding was lesser in laser than in stapler procedures. More importantly, there was only one patient with postoperative bleeding in laser group compared to significant number of patients in stapler who needed re-entry to the operating room to re-explore for postoperative bleeding. [16,17]The complication rate is higher in stapler group, however further future studies with larger sample size need to be conducted to verify the results. Cost-effectiveness is an important factor for the surgeons and the patients when deciding which technique to opt for. In India, Laser apparatus is not affordable and accessible to all because of its price and availability. The awareness regarding the laser procedure is not widespread due to the novelty of the procedure. [18,19]However, with the present study and the further research in the subject, it may gain popularity as a procedure of choice by many surgeons as well as patients. In our current study, we were able to match the equipment cost between stapler device and laser probe. It may not be possible to procure laser set-up at equivalent cost as stapling devices. However, in regard to significantly reduced hospital stay, reduced incidence of postoperative re-exploration and complications, the overall cost-effectiveness of laser surgery may be better than the stapler procedure. [20]

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CONCLUSION

In conclusion, laser hemorrhoidoplasty offers a safer alternative to stapler haemorrhoidectomy in terms of significantly better pain-control results need to be studied in terms of long-term outcome and recurrence rate compared to Stapler Haemorrhoidectomy. perioperative bleeding episodes, hospital stay and complications profile. There are no similar studies available in the literature, comparing these two procedures. Further studies with larger sample size are required to elucidate and confirm these results in long term period. Laser Haemorrhoidoplasty surgery is better than Stapler Haemorrhoidectomy surgery in terms of favourable immediate postoperative pain outcome, hospital stay and short-term complications. This technique has potential as the most effective and affordable treatment option for patients with grade II and III haemorrhoids. However, further results need to be studied in terms of long-term outcome and recurrence rate compared to Stapler Haemorrhoidectomy in grade II and Grade III patient .

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