A prospective randomized comparative study between Stapler hemorrhoidopexy and laser hemorrhoidoplasty in the management of third-degree piles

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Background
Hemorrhoidectomies are considered one of the most commonly performed procedures worldwide. Advances in techniques and technology have emerged new modalities in the management of piles with different grades.
Aim
The aim of this study is to weigh the advantages and disadvantages of laser hemorrhoidoplasty (LH) versus Stapler hemorrhoidopexy (SH).
Methods
A prospective randomized trial with 120 patients with symptomatic third degree hemorrhoidal disease who presented with pain and bleeding was undertaken in March 2020 and followed patients for two years in Ain Shams University Hospitals until March 2022. The remaining 60 patients (group B) had SH, while the first 60 patients (group A) got LH. The following factors were evaluated: preoperative complaints (bleeding Per rectum, rectal/perianal pain, mass coming out of anus), operative and postoperative outcomes, operative time, postoperative pain, bleeding, urinary retention, fecal/flatus incontinence, thrombosis of external haemorrhoids, anal/rectal stenosis, wound issues, and recurrence. The visual analog scale (VAS), which is based on a numeric pain rating scale with 0 denoting no pain and 10 denoting severe pain, was used to record postoperative discomfort.
Results
Operative time and blood loss were significantly better in LH than SH with Operative time 23.04±3.42 min in LH compared with SH 33.72±4.48 min ($P < 0.001$) and Operative blood loss in LH 5.61±1.06 ml compared with SH 11.67±1.92 ml ($P < 0.001$). There was less postoperative hospital stay in LH group.
Postoperative pain was significantly higher in SH verses LH in the first 12 h (5.83 ±0.86 in stapler vs 5.02±0.6 in laser in the first 12 h) ($P < 0.001$). Postoperative VAS score at 24 h and 1 week the VAS score was higher for LH in comparison with SH (3.86±0.48 in laser vs 3.39±0.56 in SH at 24 h), (1.59±0.37 in laser vs 1.01±0.43 at 1 week).
As regard Returning to activities SH was significantly better than LH.
Regarding early postoperative complications like early Postoperative bleeding and urinary retention we found no statistically significant difference between SH and LH in our study. As regard Late Postoperative complications SH was significantly better regarding recurrence after 2 years with only one case of recorded recurrence verses 7 cases in LH group Also, SH was significantly better regarding postoperative flatus incontinence and late anal stenosis with only one patient of Flatus incontinence and late anal stenosis in SH group verses 6 patients of Flatus incontinence and 4 patients of anal stenosis in LH group. While other late postoperative complications were better in SH Group but were not statistically Significant.
Conclusions
Both SH and LH are probably equally valuable techniques in modern haemorrhoid surgery. However, SH has an advantage because of lower pain after 24 h better, faster recovery and Return to activities and less postoperative complications so SH is a better technique with overall better outcomes. Results of LH showed be revised, liberal use of LH in third degree hemorrhoidal disease according to patient preference should be regulated. LH should be evaluated in depth in a large-volume studies.

Keywords:
circular stapler, haemorrhoidectomy, haemorrhoids, laser, stapler hemorrhoidopexy, third degree hemorrhoidal disease

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Introduction

Hemorrhoidal illness is one of the most often diagnosed conditions at outpatient clinics, with an estimated prevalence of 2.9 to 27.9% globally, more than 4% of which are symptomatic [1].

With aging till reaching 50 years old, around half the population has some level of affection. In the USA, the population over 40 is thought to have a prevalence of 58% [2]. It is unknown exactly what prevalence exists in undeveloped nations. However the prevalence is more in males than females [3].

Haemorrhoids can now be surgically removed using simpler treatments that enable patients to return to their regular activities sooner than in the past when they required laborious ligation procedures. Improvement in anatomical, physiological and pathophysiological knowledge aided in developing newer techniques with better outcomes regarding postoperative pain, returning to activities and work and even early and late complications. The most effective therapy for haemorrhoids is surgery, which is especially advised in cases with prolapsing piles during defecation that may be manually reduced (grade III) and irreducible haemorrhoids (grade IV). Other reasons for surgery include treatment, non-operative patient preference failure, and concomitant problems (such fissure or fistula) that call for surgery [4].

These methods are based on the idea that haemorrhoids are brought on by arteriovenous network hyperplasia in the anorectal submucosa. Haemorrhoids are often surgically managed by traditional surgery, either with closure of the excision raw area (Ferguson's method; 1952) or without closure (Milligan-Morgan operation; 1937). Although the conventional method is efficient, the highly innervated perianal skin suffers from significant postoperative discomfort due to wide raw area at surgical excision site.

Pain following a hemorrhoidectomy is the most frequent issue related to surgical methods. Urinary retention, secondary or reactive bleeding, and subcutaneous abscess are some of the additional early concerns. Anal fissure, anal stenosis, incontinence, fistula, and recurrence of haemorrhoids are some of the long-term side effects. A major concern is considerable pain following haemorrhoidectomies [5].

Stapler hemorrhoidopexy, proposed by Longo, has gained wide acceptance because of less postoperative pain and faster return to normal activities. Hemorrhoidal prolapse is resolved by repositioning the hemorrhoidal masses into the anal canal and by reducing the venous engorgement with transection of the feeding arteries and redundant mucosa. This technique results in a stapled mucosa anatomized in the rectum, at least 3 cm above the dentate line, where sensitive receptors are few. Reduced postoperative bleeding and an earlier return to work with a shorter hospital stay are the main benefits. Incontinence scores, earlier recovery of bowel function, analgesic necessity, wound healing, discomfort, bleeding, anal discharge, return to normal activities, and tenderness at rectal inspection were additional results in favour of the stapler [6].

Stapler hemorrhoidopexy has been compared with traditional hemorrhoidectomy in terms of total late complications, however [7]. In addition to being attributable to an arteriolar bleed along the staple line, bleeding during stapler hemorrhoidopexy can also be caused by inflammation and infection [8].

Rectal perforation, rectal blockage, and other severe consequences specifically associated with stapler procedures include rectovaginal fistula. Fortunately, the frequency of these issues has reduced as learning curves have improved. It is highlighted that compared with more traditional procedures, stapler hemorrhoidectomy was linked to a greater prevalence of recurring illness. A 'donut' of mucosa that is not completely formed may be the cause of localized persistent prolapse. To guarantee an adequate 'donut' and that the staple line rests at the proper height, the depth and height of the purse-string suture appear to be crucial. Fecal urgency and discomfort during defecation are symptoms brought on by the incorporation of some muscle into the 'donut' [9].

Due to the quick recovery period, minimal postoperative discomfort, and short operating time, stapler hemorrhoidopexy was advised. However, a substantial frequency of recurrence following stapler hemorrhoidopexy was documented in recent literature [10].

The Hemorrhoidal LASER Procedure (HeLP) procedure, which needs photocoagulation of artery branches using a LASER diode fiber, was reported as a minimally invasive technique in 2009 [11]. Hemorrhoids may now be treated with a minimum of invasiveness thanks to laser ablation. This has been done using some lasers, including carbon dioxide, argon, and nd: yag lasers. Depending on the laser

strength (irradiance) and application time, the laser beam induces tissue shrinkage and degeneration at various depths [12].

Recent evidence has supported this modality of treatment for symptomatic hemorrhoids. It can be used alone or in combination with other modalities. However, long-term results and its comparison with other methods are lacking in the literature [13].

The variety of third degree hemorrhoidal disease management options has made it difficult to determine which management strategy is optimal for each grade. Despite the majority of the currently used procedures having undergone randomized examination, the issue of the best treatment method is still up for debate. Unfortunately, patient preference and dishonest, misleading advertising across all social media platforms play a significant influence in the decision to select specific modalities over other conventional ways, which isn't the appropriate way to think.

The present study aims to describe and compare outcomes in 2 novel techniques Stapler Hemorrhoidopexy (SH) and Laser Hemorrhoidoplasty (LH). Postoperative evaluation and follow-up shall be carried out, analyzing clinical and functional aspects of patients, evaluating the improvement of symptoms, characteristics of the studied population, description of the technique used and overall symptomatic relief and complication incidence.

Data management and analysis

The collected data was revised, coded, tabulated and introduced to a PC using Statistical package for Social Science (SPSS 25). Data was presented and suitable analysis was done according to the type of data obtained for each parameter.

Descriptive statistics

(1) Mean, Standard deviation (±SD) and range for parametric numerical data, while Median and Interquartile range (IQR) for non-parametric numerical data.
(2) Frequency and percentage of nonnumerical data.

Analytical statistics

(1) Student T Test was used to assess the statistical significance of the difference between the two-study group means.
(2) Mann Whitney Test (*U* test) was used to assess the statistical significance of the difference of a non-parametric variable between two study groups.
(3) A Repeated measure ANOVA test was used to assess the statistical significance of the difference between more than two study group means.
(4) Post Hoc Test is used for comparisons of all possible pairs of group means.
(5) χ^2test was used to examine the relationship between two qualitative variables.
(6) Fisher's exact test was used to examine the relationship between two qualitative variables when the expected count is less than 5 in more than 20% of cells.

P value: level of significance

(1) *P* greater than 0.05: Nonsignificant (NS).
(2) *P* less than 0.05: Significant (S).

Descriptive analysis

Method

A prospective randomized trial with 120 patients with symptomatic third degree hemorrhoidal disease who presented with pain and bleeding was undertaken in March 2020 and followed patients for two years in Ain Shams University Hospitals until March 2022. Randomly assigned as a closed envelope, 60 patients (group a) had LH, while the other 60 patients (group B) got SH. Every patient underwent the same preoperative evaluation and postoperative follow-up. The choice of type of anthethia was according to patient preference and anesthetist's advice 81 patient (67.5%) preferred general anesthesia 39 patient (32.5%) preferred regional anesthesia. Patients were advised to evacuate rectum 6 h before surgery either with an enema or by using suppository with last meal 16 hour before surgery and clear fluid intake till 4 h before surgery. All patients were operated in lithotomy position.

Total lost follow-up was 12 patients, 4 patients in LH and the other 8 patients in SH.

Exclusion criteria: Third degree piles in chronic liver disease patients and patients on regular anticoagulant.

Preoperative assessment: general and local examination, digital rectal examination DRE, preoperative laboratory tests complete blood count (CBC), PT, PTT, INR, ALT creatinine bilirubin HBSAG, HCV AB, HIV AB, pelviabdominal ultrasound, and colonoscopy if the patient presented with recurrent anal bleeding.

Steps of stapler hemorrhoidopexy

On 60 patients in the SH group, the PPH03 circular stapler with a fixed anvil measures 33 mm in diameter. Before and after the stapler shoot, which also serves as a temponade and a hemostasis, 30 seconds of time was allowed. The operating time started when the anal dilator was turned on. A description of how to apply end anal dressing. Prolene 2/0 on a 38 mm round body needle was used to apply the purse string suture, which was tested for tightness with a finger before being tightened. The stapler totally opened up, enviel was placed proximal to purse string and tightened. Staple line was checked for any bleeding homeostasis for stapler line is adequately done by vicryl 2/0 on 38 mm round body needle and also by electro cautery, Donut was sent for histopathology routinely.

Laser hemorrhoidoplasty

Using Biolitec, the laser operation was carried out. A disposable proctoscope with a diameter of 23 mm was introduced into the anal canal while the patient was in the lithotomy position. To lessen unintended degeneration of periarterial normal tissue, laser pulses were pulsedly transmitted through a 1000 nm optic fiber using a 980-diode laser. The strength and duration of the laser beam can be adjusted to control the degree of shrinking. Five laser pulses with a total power of 13 W, lasting 1.2 seconds each, and a delay of 0.6 seconds caused tissues to contract to a depth of about 5 mm via a 1000 micron optical fiber. No bowel prep was necessary. If possible, two enemas were given 2 h before to the intervention.

The patients were followed for Operative data and Postoperative sequence with following complications for 1 year postoperative. Postoperative pain was recorded by using a 10-point visual analog scale (VAS) on which 0 represents no pain and 10 represents the worst pain imaginable. VAS protocol was followed up after 12 h, 24 h and 1 week. The duration of intervention, blood loss by millimeter, hospital stay, return to activities and postoperative complications were recorded in minutes. The data were analyzed with statistical tests and presented with respective tables and graphics.

Results

The total number of patients was 120 patients 60 patients underwent SH and the other 60 patients underwent LH according to patient preference and clinical assessment. 61 of our patients were males and the other 59 patients were females. The total lost follow-up was 12 patients (8 in SH group and 4 in LH group).

The LH procedure was performed on 60 consecutive patients who had symptomatic third degree hemorrhoidal disease and a medical history of rare episodes of prolapse manual reduction, with mean age 39.75±12.03 years.

The SH procedure was performed on 60 patients which had symptomatic third degree hemorrhoidal disease and with medical history of frequent history of prolapse and reduction, with mean age 40±12.3 years. (Tables 1–3).

Regarding operative time and blood loss LH was significantly better than SH with lower Operative time and blood loss in comparison with SH while Hospital stay was not statistically significant between the 2 groups.

Postoperative pain was measured 12 h a day using a VAS based on a numeric pain rating scale, with 0 denoting no pain and 10 denoting extreme pain. The VAS score for LH was higher than SHs at 24 h and 1 week. (Table 5).

Discussion

Hemorrhoidectomies are considered one of the most frequently performed procedures worldwide. Advances

Table 1 Details of patients under study demographic data

	Number (% / SD)
Group	
Laser	56 (51.9%)
Stapler	52 (48.1%)
Sex	
Male	61 (56.5%)
Female	47 (43.5%)

*Student *t*-test of significance (t).

Table 2 Number and percentage of patient's symptoms

	Group		Test of significance		
	Laser	Stapler			
	N (%) Mean±SD	*N* (%) Mean±SD	Value	*P*-Value	Sig.
Sex					
Male	28 (50%)	33 (63.46%)	χ^2=1.988	0.159	NS
Female	28 (50%)	19 (36.54%)			

*Chi-Square test of significance (χ^{22}).

Table 3 Types of symptoms and presentation for each group

Symptoms type	Laser	Stapler
Rectal and perianal Pain	31 (55.3%)	14 (26.9)
Prolapse with manual reduction	15 (26.7)	29 (55.7)
Recurrent bleeding	10 (17.8%)	9 (17.3)
Symptoms duration		
< 1 year	33 (58.9%)	23 (44.2%)
1–2 years	15 (26.7%)	14 (26.9%)
>2 years	8 (14.2%)	15 (28.8%)

Table 4 Intraoperative data between two study groups

	Laser	Stapler	*P*- value (significance)
Operative time/min	23.04±3.42	33.72±4.48	<0.001 (S)
Blood loss/ml	5.61±1.06	11.67±1.92	<0.001 (S)
Hospital stay/hour	19.4 +-4.6	23.8+-3.8	<0.001(s)

*Chi-Square test of significance (χ^2). *Student *t*-test of significance (t).

in techniques and technology have emerged new techniques and methods in the management of piles with different grades and presentations.

While no 100% satisfaction is present after any anal procedure especially in the early postoperative course Choice of technique which is the best choice for each grade according to clinical examination and careful history even after colonoscopy if needed is a very important step in the management.

Patient preference plays an important role in the choice of the procedure.

For third degree hemorrhoidal disease, surgical excision was considered the standard of treatment. With the advent of the stapler hemorrhoidal procedure, the ease, availability of stapler devices, increasing expertise in this technique Stapler haemorrhoidectomy has been established as a standard technique at an increasing rate. However, a lot of postoperative complication has been seen following stapler hemorrhoidopexy. Postoperative pain has always been a fear-factor in patients prone to surgical anal Procedure. Pain is the major concern, which makes patients reluctant to undergo surgical procedure.

Sutherland and colleagues [14] conducted a meta-analysis on stapler hemorrhoidopexy and included several randomized control trials. Postoperative pain scores collected at various stages after recovery show pain scores of 0.6 VAS at 1 week after surgery in stapler hemorrhoidopexy.

When compared with conventional hemorrhoidectomy, pain scores are 2-5 at 1 week. In a study performed at Colon and Rectal Clinic Orlando, early complications in stapler hemorrhoidopexy were bleeding (2.5%), urine retention (7.5%), significant pain (12.5%). Delayed complications (after 2 weeks) were bleeding (2.5%), excessive pain (2.5%) and abscess in 2.5%. The results are comparable to those found in our study Kim and colleagues [15].

Laser is an emerging technique in the management of second and third degree hemorrhoidal disease in the last decade and some patients consider it as a magical choice in the management of piles with no pain postoperative as thought by the patients.

In our study we compared two different techniques LH and SH in the management of third degree hemorrhoidal disease along 2 years of follow-up.

Operative time and blood loss were significantly better in LH than SH with Operative time 23.04±3.42 min in LH compared with SH 33.72±4.48 min ($P < 0.001$) and Operative blood loss in LH 5.61±1.06 ml compared with SH 11.67±11.92 ml ($P < 0.001$). The mean hospital stay in our study was 19.4 +-4.6 h in LH group verses 23.8+-3.8 h in SH with a significant difference and less postoperative hospital stay in LH group (Table 4).

Majumder KR and colleagues displayed comparable with a comparative study performed at Bangabandhu Sheikh Mujib Medical University (BSMMU), Anower Khan Modern Medical College and Hospital and Care Medical College and Hospital, Dhaka, Bangladesh from August 2019 to July 2020. A total of 84 patients with grade III-IV haemorrhoids were allocated into two groups: LH and (SH with 42 patients in each group prospectively. Follow-up periods were 4 months. The study mean operative time was 28.6 min (LH) and 36.2 min (SH) (P=0.0006). The average blood loss was 6.42 ml (LH) and 12.6 ml (SH) ($P < 0.05$). The mean hospital stay was 18.36 h (LH) and 28.40 h (SH) ($P < 0.05$) [16].

A prospective comparison research was undertaken by Anshuman Kaushal and colleagues. In two groups of 25 patients, SH and LH were used on 50 patients with second and third degree hemorrhoidal disease. The outcomes were not significantly different from our trial when data were compared and patients were monitored for at least three months. The mean operating times were 24.6 and 28.6 min, respectively ($P = 0.122$). The

Table 5 Postoperative VAS follow-up for the study group

	Group		Student *t*-test		
	Laser	Stapler			
	Mean±D	Mean±SD	*t*	*P*-Value	Significance
Postoperative pain at 12 h VAS score	5.02±0.6	5.83±0.86	−5.627	<0.001	S
Postoperative pain at 24 h VAS score	3.86±0.48	3.39±0.56	4.634	<0.001	S
Postoperative pain at 1 week VAS score	1.59±0.37	1.01±0.43	7.349	<0.001	S
Repeated measure ANOVA					
P-Value	<0.001	<0.001			
Sig.	S	S			

mean hospital stay was 21.44 h (LH) and 32.64 h (SH) (P.05), and the average blood loss was 8.32 ml (LH) and 11.64 ml (SH) on average [17].

Postoperative pain was significantly higher in SH verses LH in the first 12 h (5.83±0.86 in stapler vs 5.02±0.6 in laser in the first 12 h) ($P < 0.001$). Postoperative VAS score at 24 h and 1 week the VAS score was higher for LH in comparison with SH (3.86±0.48 in laser vs 3.39±0.56 in SH at 24 h), (1.59±0.37 in laser vs 1.01±0.43 at 1 week) (Table 5).

Majumder KR and colleagues Mean postoperative pain score VAS at 24 h was 2.6 (LH) and 4.6 (SH) ($P < 0.05$), at 1 week was 0.46 (LH) and 0.88 (SH) ($P = 0.05$) [16].

Anshuman Kaushal and colleagues showed different results with better pain tolerance in laser in comparison with stapler hemorrhoidectomy. Mean postoperative pain score VAS at 12 h was 2.64 (LH) and 4.76 (SH) ($P < 0.05$), at 24 h was 1.88 (LH) and 3.6 (SH) ($P < 0.05$), at 1 week was 0.36 (LH) and 0.88 (SH) ($P = 0.054$) [17].

As regard Returning to activities SH was significantly better than LH with mean recorded time 9.3±2.1 days in SH verses 13.2±2.4 in LH (Table 6).

Table 6 Returning to activities

Returning to activities	Stapler	Laser	−3.37	<0.001	S
	9.3±2.1	13.2±2.4			

In contrary to our study Majumder KR and colleagues [16] conducted a study said that haemorrhoids treated with LH had a better outcome than SH in terms of early postoperative pain as well as complications and was associated with early return to work. LH was the most effective and alternative to the popular SH for third degree hemorrhoidal disease. While both studies showed shorter hospital stay in LH group verses SH group.

Regarding early postoperative complications like early Postoperative bleeding and urinary retention we found no statistically significant difference between SH and LH in our study with only 1 patient in each group needed Intraoperative homeostasis for early postoperative bleeding, and only 5 patients with Urinary retention verses 4 patients in SH group which was statistically nonsignificant. Also readmission was not statistically significant in both groups (Table 7).

One patient in LH (4%) had a postoperative hemorrhage on the fourth postoperative day,

Table 7 Early postoperative complications

	Group		Test of significance		
	Laser	Stapler			
	N (%)	*N* (%)	Test value	*P*-Value	Significance
Re admission	4 (7.14%)	2 (3.85%)	Fisher exact test	0.680	NS
Immediate Post-operative bleeding	5 (8.93%)	7 (13.46%)			
	4 patient Conservative treat	6 Conservative treat	χ^2=0.561	0.454	NS
	1 patient needed Intra-operative homeostasis	1 patient needed Intra-operative homeostasis			
Urinary retention	5 (8.93%)	4 (7.69%)	Fisher exact	1	NS

Table 8 Late Post-operative complications and complaints

	Group		Test of significance		
	Laser (56)	Stapler (52)			
	N (%)	*N* (%)	Test value	*P*-Value	Significance
Persistence of pain after 1 month	11 (19.64%)	6 (11.54%)	χ^2=1.335	0.248	NS
Thrombosed external piles	10 (17.86%)	4 (7.69%)	χ^2=2.469	0.116	NS
Infection secondary hemorrhage	4 (7.14%)	2 (3.85%)	Fisher exact test	0.680	NS
Sub mucus abscess	2 (3.57%)	0	Fisher exact test	0.496	NS
Persistent external skin tags	14 (25%)	8 (15.38%)	χ^2=1.537	0.215	NS
External piles removed surgically	4 (7.14%)	2 (3.85%)	Fisher exact test	0.680	NS
Recurrence after 2 years of follow up	7 (12.5%)	1 (1.92%)	Fisher exact test	0.001	S
Urgency in the first 6 months	3 (5.35%)	5 (9.61%)	Fisher exact test	0.229	NS
Recurrent bleeding	6 (10.71%)	2 (3.85%)	Fisher exact test	0.273	NS
Anal burning, irritation, itching and moisture	9 (16.07%)	2 (3.85%)	χ^2=4.405	0.036	S
Flatus incontinence	6 (10.71%)	1 (1.92%)	Fisher exact test	0.035	S
Late-Anal / Rectal stenosis after 1 year	4 (7.14%)	1 (1.92%)	Fisher exact test	0.365	NS

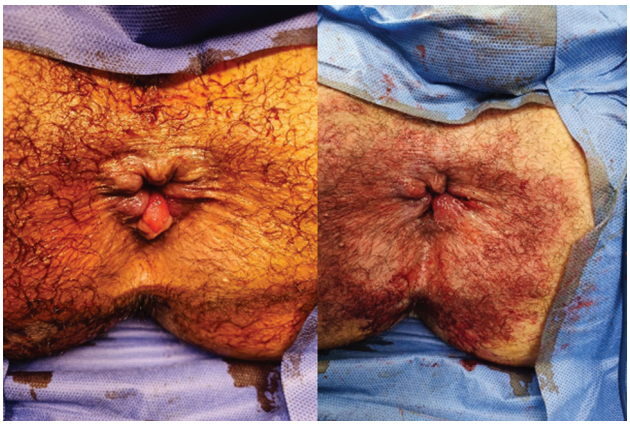
Figure 1

Showing used stapler, port insertion, firing of the stapler and post firing donuts.

according to research by Anshuman Kaushal and colleagues. In the SH group, 2 (8%), bleeding on the same day, 1 (4%) bleeding on follow-up, and 1 (4%) recurrence were all associated with significant postoperative pain with VAS greater than 8, necessitating a prolonged hospital stay. They concluded that LH performs better than SH in terms of early postoperative discomfort and complications. A shorter hospital stay and an earlier return to work were linked to it. With contrast to SH, there were no substantial difficulties with LH for second and third degree hemorrhoidal disease. LH is a very feasible alternative to the commonly used SH Kaushal and colleagues [17].

As regard late Postoperative complications SH was significantly better regarding recurrence after 2 years with only 1 case of recorded recurrence verses 7 cases in LH group. Also SH was significantly better regarding

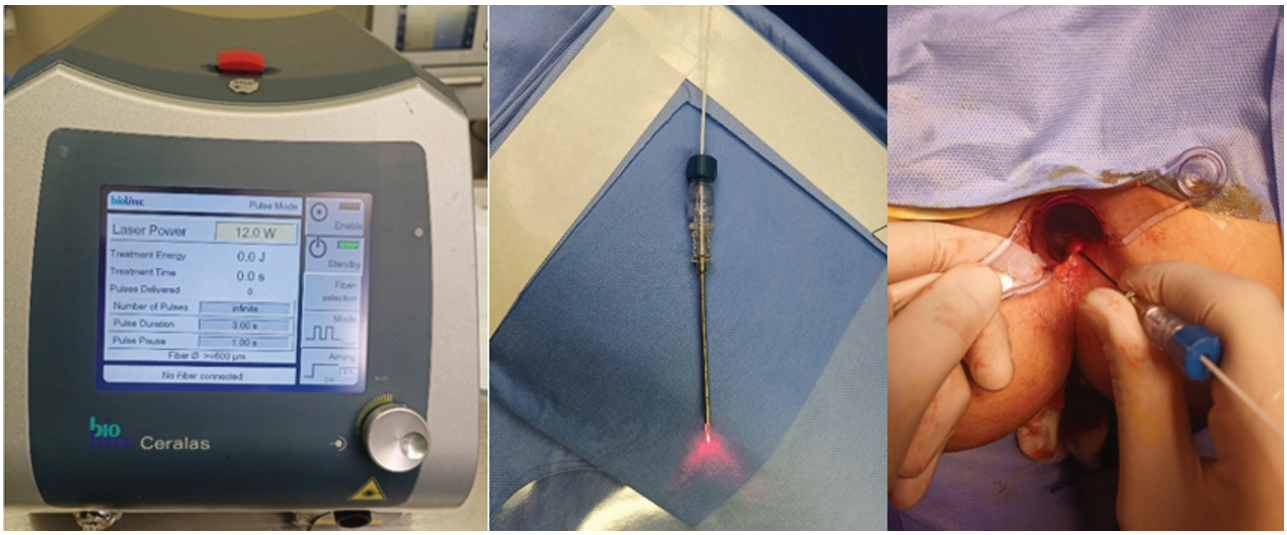
Figure 2



Showing anal canal before and after stapled Hemorrhoidectomy.

postoperative flatus incontinence and late anal stenosis with only one patient of Flatus incontinence and late anal stenosis in SH group verses 6 patients of Flatus

Figure 3

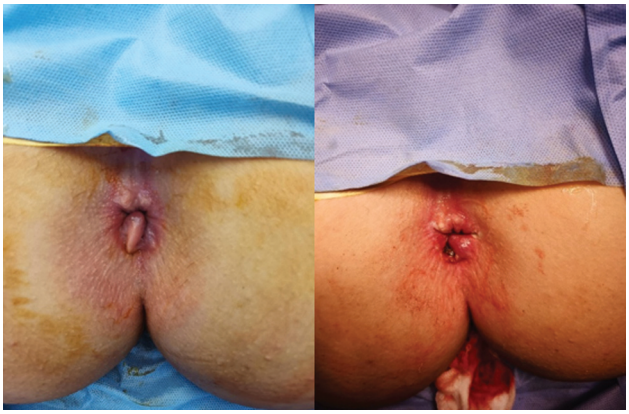


Showing used laser apparatus and probe and technique of cannulation and ablation.

incontinence and 4 patients of anal stenosis in LH group. While other late postoperative complications were better in SH group but were not statistically significant as shown in Table 8.

As regard Cost-effectiveness both procedures are effective but according to our study SH has a better outcome regarding better VAS pain score at 24 h and 1 week earlier Returning to activities and less recurrence. While operative time, operative blood loss, and Hospital stay was significantly better in LH group. Also financially both groups cost around near the same cost (1400 +- 50 $ for SH and 1350 +- 60$ in LH).

Figure 4

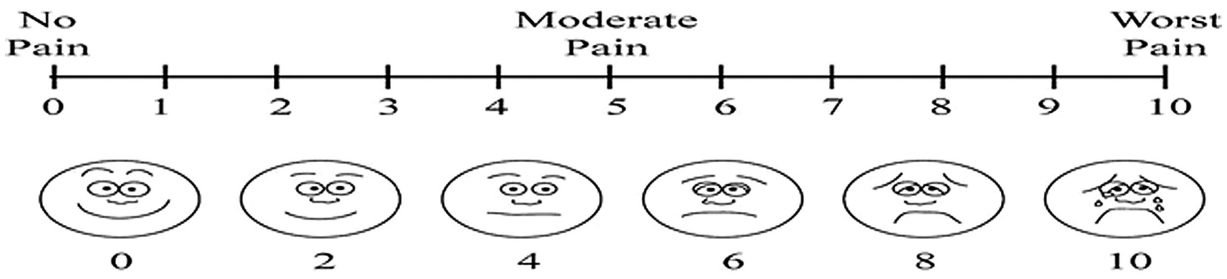


Showing anal canal before and after Laser hemorrhoidoplasty.

Conclusions

Both SH and LH are probably equally valuable techniques in modern hemorrhoid surgery. However, SH has an advantage because of lower pain after 24 h better, faster recovery and return to activities and fewer postoperative complications so SH is a better technique with overall better outcomes. Results of LH showed be revised, liberal use of LH in third degree hemorrhoidal disease according to patient preference should be regulated. LH should be evaluated in depth in large volume studies Figs. 1–5.

Figure 5



VAS score for postoperative pain assessment.

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Conflicts of interest

Competing interests: 0 did not declare

References

1 Johanson JF, Sonnenberg A. The prevalence of hemorrhoids and chronic constipation. An epidemiologic study. Gastroenterology 1990; 98:380–6.

2 Cohen Z. Symposium on outpatient anorectal procedures. Alternatives to surgical hemorrhoidectomy. Can J Surg J Can Chir 1985; 28:230–1.

3 Bartolo DCC. Surgery of the anus, rectum and colon. Vols 1 and 2. M. R. B. Keighley and N. S. Williams. 282×205mm. Pp. 2448. Illustrated. 1993. London: W. B Saunders. £280. BJS Br J Surg 1994; 81:1085–1085.

4 Rivadeneira DE, Steele SR, Ternent C, Chalasani S, Buie WD, Rafferty JL, *et al.* Practice parameters for the management of hemorrhoids (revised 2010). Dis Colon Rectum 2011; 54:1059–64.

5 Picchio M, Greco E, Di Filippo A, Marino G, Stipa F, Spaziani E. Clinical Outcome Following Hemorrhoid Surgery: a Narrative Review. Indian J Surg 2015; 77(S3):13017.

6 Sutherland LM, Burchard AK, Matsuda K, Sweeney JL, Bokey EL, Childs PA, *et al.* Stapled Hemorrhoidope: The Argument for Usage. Clin Colon Rectal Surg 2004;17:131–42. A Systematic Review of stapled hemorrhoidectomy. Arch Surg 2002;137(12):1395406

7 Touzin E, Hegge S, McKinley C. Early experience of stapled hemorrhoidectomy in a community hospital setting. Can J Surg 2006; 49:316–20.

8 Oughriss M, Yver R, Faucheron J-L. Complications of stapled hemorrhoidectomy: A French multicentric study. Gastroenterol Clin Biol 2005; 29:429–33.

9 Cheetham MJ, Mortensen NJ, Nystrom PO, Kamm MA, Phillips RK. Persistent pain and faecal urgency after stapled haemorrhoidectomy. Lancet Lond Engl 2000; 356:730–3.

10 Nyström P-O., Qvist N, Raahave D, Lindsey I, Mortensen N. Randomized clinical trial of symptom control after stapled anopexy or diathermy excision for haemorrhoid prolapse. BJS Br J Surg 2010; 97:167–76.

11 Brusciano L, Gambardella C, Terracciano G, Gualtieri G, Schiano di Visconte M, Tolone S, *et al.* Postoperative discomfort and pain in the management of hemorrhoidal disease: Laser hemorrhoidoplasty, a minimal invasive treatment of symptomatic hemorrhoids. Updat Surg 2019; 72:851–857.

12 Danys D, Pacevicius J, Makunaite G, Palubeckas R, Mainelis A, Markevicius N, *et al.* Tissue Coagulation in Laser Hemorrhoidoplasty – An Experimental Study. Open Med Wars Pol 2020; 15:1859.

13 Maloku H, Gashi Z, Lazovic R, Islami H, Juniku-Shkololli A. Laser Hemorrhoidoplasty Procedure vs Open Surgical Hemorrhoidectomy: A Trial Comparing 2 Treatments for Hemorrhoids of Third and Fourth Degree. Acta Inform Medica AIM J Soc Med Inform Bosnia Herzeg Cas Drustva Za Med Inform BiH 2014; 22:365–7.

14 Sutherland LM, Burchard AK, Matsuda K, Sweeney JL, Bokey EL, Childs PA, *et al.* A Systematic Review of stapled hemorrhoi-dectomy. Arch Surg 2002; 137:1395–406.

15 Kim R, Ferrara A, Soliman M, Stevens R, DeJesus S, Williamson P, *et al.* Comparison of Results and Complicationsof Stapled Hemorrhoidopexy PerformedWith the Ethicon and Covidien Staplers –SAGES. [cited 2019 Dec 19]

16 Majumder KR, Alam TA, Rassell M. LASER Haemorrhoidoplasty versus Stapler Haemorrhoidopexy: A Prospective Comparative Study. Mymensingh Med J 2021; 30:780–788.

17 Kaushal A, Aggarwal A, Khanna A, *et al.* A Prospective Comparative Study: Stapler Hemorrhoidopexy vs Laser Hemorr hoidoplasty in the treatment of Hemorrhoids. Journal of Advances in Medicine and Medical Research 2020; 32:10–23.