

COMPARATIVE EVALUATION OF LASER VERSUS CONVENTIONAL SURGICAL
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ABSTRACT

Background: Hemorrhoids are specialized submucosal tissue cushions found in the anal canal. Typical symptoms include painless rectal bleeding, anal pain, itching, discharge, and hemorrhoidal tissue prolapse. Hemorrhoids are treated based on their severity; minor cases can be managed without surgery, while severe cases require surgery. Various treatment options include band ligation, stapled hemorrhoidopexy, sclerotherapy, Doppler-guided artery ligation, hemorrhoidal dearterialization, and surgical excision. **Objectives:** To compare the clinical outcomes between laser treatment and traditional surgical treatment of hemorrhoids. **Methods:** The study included 100 patients. Those with coagulopathy, inflammatory bowel disease, or previous anorectal surgery were excluded. The study patients were divided into two groups: laser hemorrhoidectomy (Group A) and open hemorrhoidectomy (Group B). The study questionnaire was divided into four parts. Part one for the sociodemographic information. Part two for the operative time. Part three for postoperative pain assessment according to the Visual Analogue Score (VAS) at 24 hours, hospital stay, time to return to normal activity, early postoperative complications such as bleeding, infection, failure of operation and urinary retention. And part four for follow up visit at 6-months for late postoperative complications such as stenosis, incontinence, and recurrence. **Results:** Group A showed significantly reduced postoperative pain, a faster recovery, and a shorter hospital stay compared to Group B. However, the rates of hemorrhoid recurrence were comparable in both groups. Consequently, the study concluded that laser hemorrhoid treatment provides a less painful and faster alternative to traditional surgery, although long-term results remain similar. **Conclusions:** Laser hemorrhoidoplasty is a safer, effective, and less painful alternative to conventional surgical hemorrhoidectomy. It dramatically decreases hospitalization time and enhances surgical recovery. However, both techniques are equally effective in preventing long-term complications.

KEYWORDS: Hemorrhoid, Iraq, Laser, Mosul, Open.

INTRODUCTION

Hemorrhoids are specialized submucosal tissue cushions found in the anal canal.^[1] Typical symptoms include painless rectal bleeding, anal pain, itching, discharge, and hemorrhoidal tissue prolapse.^[1-2] Hemorrhoids affect 3-30% of people worldwide.^[3] The most commonly affected age group is 45–65 years old, and after that, there is a decline.^[4] It affects males more than females.^[5-6] Depending on the extent of anal canal prolapse,

hemorrhoids can be classified as internal, external, or mixed.^[7]

Per rectum bleeding is the first sign of piles, while anal pain is less frequently noted.^[8] Hemorrhoids are classified into four degrees (grades). In first-degree hemorrhoids, patients only have per rectum bleeding, in second-degree hemorrhoids, patients have lumps that appear at the anal orifice during defecation and then

disappear, while in third-degree hemorrhoids, patients should do manual replacement for hemorrhoids disappearance, and in contrast to fourth-degree hemorrhoids which remain outside permanently.^[9] Hemorrhoids are treated based on their severity; minor cases can be managed without surgery, while severe cases require surgery. Various treatment options include band ligation, stapled hemorrhoidopexy, sclerotherapy, Doppler-guided artery ligation, hemorrhoidal dearterialization, and surgical excision.^[10] Conventional open hemorrhoidectomy, especially the Milligan-Morgan technique, is still commonly employed due to its efficacy in treating advanced-grade hemorrhoids. However, it is associated with high postoperative morbidity. With advancements in technology, laser hemorrhoidoplasty has evolved as a minimally invasive method that attempts to lessen tissue trauma, postoperative discomfort, and fast healing.^[11]

This study aims to critically evaluate and compare the clinical outcomes of laser and conventional surgical treatment of hemorrhoids.

MATERIALS AND METHODS

This is a prospective, comparative study. It was conducted between the 1st of April 2024 to the end of March 2025 at Mosul General Hospital and Al Mosul surgical daily private clinic. The study included 100 patients aged 18–65 with Grade II–III hemorrhoids. The study excluded patients with with coagulopathy, inflammatory bowel disease, or previous anorectal surgery.

The study patients divided into two groups according to the type of treatment they received. Group A: includes 50 patients underwent laser hemorrhoidoplasty using diode laser (1470 nm) matched with 50 patients underwent Milligan-Morgan open hemorrhoidectomy (Group B). All patients underwent a history and a general and local examination. The standard position was left lateral decubitus, however patients with difficult resting in such position might alternatively evaluated by lying supine. The laboratory investigations listed were; Complete blood count, Liver, and Kidney Function Tests. Blood sugar levels were randomly determined. Coagulation profile Tests include prothrombin time, partial thromboplastin time, and International normalized ratio. If necessary, cardiac tests was performed.

The investigators did the operative by themselves. For laser hemorrhoidoplasty, all patients were given spinal anesthesia. After positioning the patient for a lithotomy, betadine is administered to sterilize the area. A digital rectal examination was performed to assess any mass or tone in the anal sphincter. A modified proctoscope was then inserted into the anal canal to identify the superior hemorrhoid arteries' terminal branches, which were approximately 3 cm above the dentate line. The laser optic cable was implanted in the core of the hemorrhoid

using 3 mm stab incisions and probed directly into the submucosa. The hemorrhoidal arteries were sealed using a pulsed laser at a wavelength of 980 nm. To avoid harm or burn to nearby structures, utilizing 5 pulses of 13 w each lasting 1.2 seconds with a 0.6 second interval. The laser fiber was kept parallel to the anal canal. The proctoscope was rotate clockwise and repeat for each hemorrhoidal artery. After a laser operation finishes, ice is utilized to reduce heat. Hemostasis was performed by simple pressure (no sutures required). On the other hand, for open hemorrhoidectomy, all patients had spinal anesthesia. To examine pile position and rule out other anal disease, the patient was put in the lithotomy position. The hemorrhoidal cushion is secured with an Allis clamp distally and an artery forceps proximally. The hemorrhoidal cushion is separated between the mucocutaneous junction and the hemorrhoidal pedicle, whereas the anal sphincter remains in the pedicle. The pile pedicle is sealed twice for better hemostasis and less post-operative hemorrhage. The procedure was repeated for the second and third hemorrhoids, using skin bridges and an anal pack if necessary.

The study questionnaire was divided into four parts. Part one for the sociodemographic information. Part two for the operative time. Part three for postoperative pain assessment according to the Visual Analogue Score (VAS) at 24 hours, hospital stay, time to return to normal activity, early postoperative complications such as bleeding, infection, failure of operation and urinary retention. And part four for follow up visit at 6-months for late postoperative complications such as stenosis, incontinence, and recurrence.

Statistical analysis was conducted using SPSS version 30.0 (SPSS Inc., Chicago, USA). Quantitative data were presented as mean $\pm$ standard deviation. Qualitative data were presented as frequency and percentages. Student's t-test or was used to compare numerical variables. Chi squared test was used to compare categorical variables. A p value of <0.05 was considered statistically significant for all statistical tests.

RESULTS AND DISCUSSION

The study included 100 patients, the mean age $\pm$ standard deviation of the study participants was 38.32 ± 9.71 years. Of them 69 (69%) were males and 31 (31%) were females with male to female ratio of 2.22:1. As shown in figure 1.

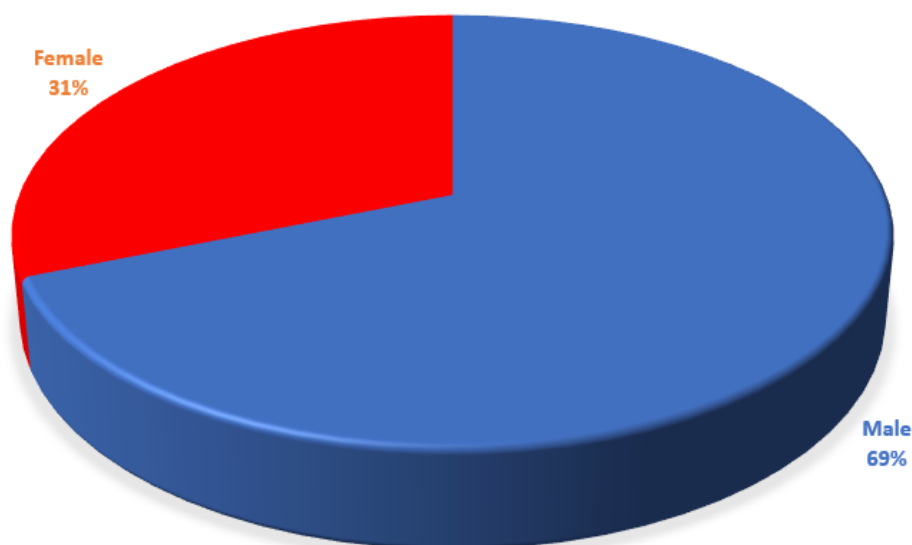


Figure 1: Distribution of the study patients according to their gender.

These findings are in agreement with other studies' findings^[12-14] and with another study conducted in Sudan^[15] and it indicates that most patients were in their

late 20s to late 40s, and males represent a larger proportion of the patient population with anal hemorrhoid.

Table 1: Comparison between the study groups according to their sociodemographic information. (number =100).

Variable	Laser hemorrhoidoplasty = 50	Open hemorrhoidectomy = 50	P-Value
Sex:			
- Male	33 (66%)	36 (72%)	0.420
- Female	17 (34%)	14 (28%)	
Age (years), mean ± standard deviation	39.21 ± 9.89	37.87 ± 9.64	0.636

The study patients were matched according to their age and as much as possible according to their sex, as a result no significant difference found between them regarding

these variables. The same thing for pile grades, no statistically significant difference found between the two groups, which runs with other study finding.^[16]

Table 2: Comparison between the study groups according to their pile grades. (number =100).

Pile grade	Laser hemorrhoidoplasty = 50	Open hemorrhoidectomy = 50	P-Value
Grade II	35 (70%)	33 (66%)	0.668
Grade III	15 (30%)	17 (34%)	

Laser hemorrhoidoplasty found in the current study to have superior results over open hemorrhoidectomy in the terms of operative time, hospital stay and return to normal activity, leading to better patient satisfaction and better overall quality of life compared to traditional open hemorrhoidectomy. Several studies showed comparable results.^[17-19] The reduced tissue damage from laser

results in less pain and faster healing. The higher cost of laser treatment remains a consideration, though it is offset by the reduced hospital stay and earlier return to work.

Table 3: Comparison between the study groups according to operative time, hospital stay and time of return to normal activity. (number =100).

Variable	Laser hemorrhoidoplasty = 50	Open hemorrhoidectomy = 50	P-Value
Operative time (minute), mean $\pm$ standard deviation	25.23 $\pm$ 5.11	35.58 $\pm$ 6.79	<0.001
Hospital stays (days), mean $\pm$ standard deviation	1.29 $\pm$ 0.41	3.53 $\pm$ 1.17	<0.001
Time of return to normal activity (days), mean $\pm$ standard deviation	4.12 $\pm$ 1.59	9.18 $\pm$ 2.52	<0.001

Regarding to early postoperative complications, laser hemorrhoidoplasty found in this study to have better postoperative pain and less postoperative bleeding than open hemorrhoidectomy, which similar to other study findings.^[17-21] On the other hand, no statistically significant difference between the two groups regarding urinary retention which goes with other study finding.^[15] Anyhow, laser hemorrhoidoplasty found in the current

study to have statistically significant higher failure rate than open hemorrhoidectomy, although this is similar to other studies finding^[15-16], meta-analysis showed no significant difference.^[22] This means that the decision should be made on a case-by-case basis, considering that some studies indicate a potential for higher long-term recurrence compared to open hemorrhoidectomy.

Table 4: Comparison between the study groups according to their early postoperative complications. (number =100).

Variable	Laser hemorrhoidoplasty = 50	Open hemorrhoidectomy = 50	P-Value
Postoperative Pain (visual analogue score at 24 hours)	3.22 $\pm$ 1.18	6.81 $\pm$ 1.39	<0.001
Bleeding, number (%)	4 (8%)	16 (32%)	<0.001
Urinary retention	1 (2%)	3 (6%)	0.212
Operation failure	4 (8%)	0 (0%)	0.029

Regarding the late postoperative complications (at 6 months after operation), the study shows no statistically significant difference between the two groups with

regard to stenosis, incontinence and recurrence of hemorrhoid, which agrees with other study findings.^[23]

Table 5: Comparison between the study groups according to their late postoperative complications. (number =100).

Variable	Laser hemorrhoidoplasty = 50	Open hemorrhoidectomy = 50	P-Value
Stenosis	1 (2%)	1 (2%)	1
Incontinence	0 (0%)	0 (0%)	1
Recurrence	2 (4%)	1 (2%)	0.343

The study's limitations include small sample size, single-center design and lack of comparison regarding the cost-effective outcomes between the two operations.

5- CONCLUSION

Laser hemorrhoidoplasty is a safer, effective, and less painful alternative to conventional surgical hemorrhoidectomy. It dramatically decreases hospitalization time and enhances surgical recovery. However, both techniques are equally effective in preventing long-term complications. Further large-scale,

multicenter studies are required to verify these findings and determine cost-effectiveness.

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