

Challenges and Prospects of Laser Haemorrhoidoplasty in a Low Resource Setting: The LUTH Experience

Abstract

Background: Haemorrhoids are the most common condition of the anal canal causing significant disability. Traditional excisional haemorrhoidectomy and its various modifications, while effective, may be attended by severe postoperative pain and other complications. Laser haemorrhoidoplasty is reported to be effective with fewer complications and shorter hospital stay. **Objectives:** The aim of this study was to report the outcome of intrahaemorrhoidal coagulation with 1470-nm diode laser at the Lagos University Teaching Hospital. **Patients and Methods:** The procedures were performed with a radially emitting laser fibre from Biolitec AG–CeramOptec (Bonn, Germany). The duration of symptoms, grade of the haemorrhoids, duration of the procedures, and postoperative complications were evaluated. **Results:** Eleven patients had laser haemorrhoidoplasty. There were seven males and four females. The age range was 23–71 years, with a median age of 47 years and an interquartile range (IQR) of 28–57 years. Duration of surgery ranged from 20 to 90 min, with a median of 33 min and IQR of 25–53 min. Postoperative pain was mild in eight patients and moderate in three. Ten patients were discharged as day cases and one 3 days later due to spinal anaesthesia-related headache and acute urinary retention. One patient later had an anal ulcer probably due to too much energy delivered during the procedure, this was managed conservatively. There was no postoperative wound infection, anal incontinence, anal stenosis, subcutaneous abscess, and fistula or recurrence. **Conclusion:** The advantages of laser haemorrhoidoplasty make it a readily acceptable form of treatment for haemorrhoids in our setting.

Keywords: Challenges, haemorrhoidoplasty, laser, prospects

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Introduction

Haemorrhoids are the most common condition of the anal canal, affecting millions of people worldwide, and causing significant disability.^[1-3] Common symptoms include rectal bleeding, prolapse, anal pain, itching, or irritation.^[1,4] Although several treatment options have been proposed for symptomatic haemorrhoids not responding to medical therapy, there are differing opinions on the ideal procedure.^[3-6]

While traditional excisional haemorrhoidectomy and its various modifications are an effective treatment option, severe postoperative pain and discomfort have remained major problems. Bleeding, incontinence, anal stenosis, urinary retention, wound infection, subcutaneous abscess, and fistula can occur, resulting in longer hospital stay and delayed return to normal activity.^[3,7] In our setting,

even moderately symptomatic patients usually decline surgical treatment because of the fear of these and other perceived complications.^[8,9]

The use of laser techniques in the treatment of haemorrhoids is reported to be effective with better pain relief and less bleeding postoperatively. This minimally invasive treatment is an outpatient procedure with a very short hospital stay and results in tissue shrinkage while preserving anatomy.^[1-4,10] The aim of this retrospective review was to report the outcome of intrahaemorrhoidal coagulation with 1470-nm diode laser at the Lagos University Teaching Hospital (a low resource setting), highlighting its prospects and initial challenges.

Patients and Methods

Preoperative

This is a retrospective single-institution review that was performed at the Lagos University Teaching Hospital, Lagos,

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from November 2016 to July 2021 and approved by the Institutional Review Committee. All consecutive patients with second-, third-, and fourth-degree haemorrhoids who were fit for anaesthesia and intervention were included. Patients who had haemorrhoids associated with complications (thrombosed, ulcerated, or strangulated) were excluded.

Written informed consent was obtained from all patients before the procedure. A detailed history was obtained from each patient preoperatively. Physical evaluation, routine blood tests, and proctoscopy were performed. The procedures were done under local or spinal anaesthesia as indicated. One-day mechanical bowel preparation was done with clear oral fluids and administration of two picolax sachets or using Epsom salts.

Intraoperative

The procedures were performed with a radially emitting laser fibre from Biolitec AG–CeramOptec (Bonn, Germany). This is a solid-state laser where the light is guided due to the total internal reflection in a single-mode optical fibre (a flexible, transparent fibre made by drawing plastic to small diameters, usually in millimetres) powered by a semiconductor (diode).^[11] With each patient placed in the lithotomy position, a disposable proctoscope with a diameter of 23 mm was inserted into the anal canal. Mucopexy was performed above the dentate line to lift the prolapsed haemorrhoids, usually at 3, 7, and 11 o'clock. This is by suturing the mucosa at each haemorrhoidal node, starting above the dentate line and proceeding proximally to hitch up the haemorrhoid, with Vicryl 2/0. After making a 1-mm opening at the external border of the haemorrhoid, the fibre was introduced into the haemorrhoidal node in the submucosa parallel to the axis of the anal canal.

Laser shots were delivered with a 1470-nm diode laser through a 600- μ m optic fibre in a pulsed pattern, to prevent damage to normal tissue, at a power of 10 W with a duration of 3 s per pulse and a pause of 0.5 s, thereby causing coagulation and shrinkage to a depth of approximately 2–3 mm. A total of 200–600 J or more of energy was delivered to each haemorrhoid, depending on its size. An ice finger was then applied to each treated haemorrhoidal node, intra-anally for 1–2 min to minimise the effect of the heat generated. Antibiotic prophylaxis with 1 g of intravenous ceftriaxone was routinely administered at the commencement of the procedure except in one patient who had 1.2 g of intravenous augmentin. All patients were to be discharged on the day of surgery and followed up, except if there was a complication necessitating further hospital stay.

Postoperative

Postoperative pain was assessed with a 10-point verbal rating scale, in which 0 represents no pain and 10 represents the worst pain imaginable.^[12] The duration of the intervention was recorded in minutes.

Data collected included the duration of symptoms, grade of the haemorrhoids, duration of the procedures, scale of postoperative pain, whether there were postoperative complications such as bleeding, urinary retention, wound infection, subcutaneous abscess, fistula, faecal incontinence, anal stenosis, resolution or persistence of the haemorrhoids, and recurrence of condition. The data were inputted into and analysed with STATA version 13.0 (Stata Corporation, College Station, Texas). Continuous data were presented as median and range, whereas categorical data were presented as proportions.

Results

Eleven patients had laser haemorrhoidoplasty during the study period. There were seven males and four females. The age range was 23–71 years, with a median age of 47 years and an interquartile range (IQR) of 28–57 years. Nine patients had bleeding, duration ranging from 2 weeks to 260 weeks, with an IQR of 5–172 weeks [Table 1], and pack cell volume ranging from 27.5% to 44% [Table 2]. There was no syncope from bleeding, but one patient was anaemic from clinical and laboratory evaluations [Table 2].

Most of the patients presented with second-degree or third-degree haemorrhoids; two had fourth degree [Table 2].

Four patients had constipation, pain was present in one patient, and anal discharge in one. There was no other complication apart from anaemia in two patients. Five patients had comorbidities, four of which were hypertensive, including one who had hypertension and dyspepsia and one with dyspepsia as the only comorbidity. None was diabetic, on immunosuppressant, or a sickle cell patient.

The patients were managed together by two certified surgeons. At surgery, six patients were noted to have third-degree haemorrhoids, whereas one had second degree and four had fourth degree [Table 3].

Duration of surgery ranged from 20 to 90 min, with a median of 33 min and IQR of 25–53 min. Postoperative pain was mild in eight patients and moderate in three. Blood loss was minimal ranging from insignificant to 80 mL, median 20 mL, IQR 10–50 mL.

Perioperatively, one patient had pain, headache, and acute urinary retention, which all resolved by increasing the analgesia and passing a urinary catheter; another had headache again, which resolved with analgesia. The other nine patients did not have any perioperative complications. Ten patients were discharged as day cases and one 3 days later due to spinal anaesthesia-related headache and acute urinary retention. One patient later had an anal ulcer probably due to too much energy delivered during the procedure, this was managed conservatively. There was no postoperative wound infection, anal incontinence, anal stenosis, subcutaneous abscess, fistula, or recurrence [Table 4].

Table 1: Symptoms (n = 11)

Parameter	No. of patients	%
Bleeding (number)	9	81.8
Bleeding duration (median, IQR) weeks	52 (5–172)	
2nd–4th degree	10	90.9
Duration (median, IQR) weeks	52 (22–1300)	
First degree	0	0.0
Second degree	4	36.4
Third degree	5	45.4
Fourth degree	2	18.2
Pain		
Absent	7	63.6
Present	4	36.4
Anal discharge or leakage		
Absent	10	90.9
Present	1	9.1
Pruritus Ani		
Absent	10	90.9
Present	1	9.1
Constipation		
Absent	6	54.5
Present	5	45.5

Table 2: Signs (n = 11)

Parameter	No. of patients	%
Anaemia (PCV < 30)	1	9.1
Proctosigmoidoscopic findings		
First degree	0	0.0
Second degree	2	18.2
Third degree	7	63.6
Fourth degree	2	18.2
Comorbidities		
Hypertension	3	27.3
Hypertension, dyspepsia	1	9.1
Dyspepsia	1	9.1
None	6	54.5
Packed cell volume (median, IQR)	40.7 (38–43)	
PCV, packed cell volume		

Table 3: Surgery

Parameter	No. of patients	%
Degree of haemorrhoids		
First degree	0	0.0
Second degree	1	9.1
Third degree	6	54.5
Fourth degree	4	36.4
Duration of procedure (median, IQR)	33 (25–53) min	
Estimated blood loss (median, IQR)	20 (10–50) mL	

Discussion

Although laser was launched in 1951, medical use was first reported by Goldman in 1962 to remove a tattoo and has since become an important aspect of current surgical practice.^[13] Laser ablation has created new frontiers for

Table 4: Postoperative pain and outcome of the procedures

Parameter	No. of patients	%
Postoperative pain		
None	1	9.1
Mild	7	63.6
Moderate	3	27.3
Post discharge analgesia		
Paracetamol	1	9.1
Cocodamol (paracetamol/codeine)	5	45.5
Paracetamol/tramadol	4	36.4
Tramadol	1	9.1
Number of days post op admission		
Day case	10	90.9
3 days	1	9.1
Perioperative complications		
None	9	81.8
Pain, headache and urinary retention	1	9.1
Spinal headache	1	9.1
Late complication		
None	10	90.9
Anal ulcer	1	9.1

the minimally invasive therapy of haemorrhoids. Carbon dioxide, neodymium-doped yttrium aluminum Garnet, and argon lasers are commonly used lasers in surgery; however, diode lasers are now an integral part of lasers in surgery with high flexibility.^[3] The laser energy generated results in tissue degeneration and shrinkage of variable degree and depths dependent on the amount of energy delivered.^[3]

There are multiple treatment modalities for haemorrhoidal disease and although different techniques have been

Table 5: Summary of patients

Patient	Sex	Age (years)	Clinical presentation	Findings at surgery	Duration of procedure (min)	Scale of postoperative pain	Duration of hospital stay event/ (days)	Perioperative complication	Later complication
1	Male	60	3rd-degree haemorrhoids	3rd-degree haemorrhoids	45	Mild	Day case	No	No
2	Male	23	Bleeding, 2nd-degree haemorrhoids, anal discharge, pain	2nd-degree haemorrhoids	25	Mild	Day case	Headache	No
3	Male	57	Bleeding, 2nd-degree haemorrhoids, anal discharge, pain	3rd-degree haemorrhoids	20	Mild	Day case	No	No
4	Male	44	Bleeding, 3rd-degree haemorrhoids, anaemia	3rd-degree haemorrhoids	35	Moderate	Day case	No	Anal ulcer
5	Male	27	Bleeding, 3rd-degree haemorrhoids, constipation	3rd-degree haemorrhoids	25	Mild	Day case	No	No
6	Male	37	Bleeding, 3rd-degree haemorrhoids	3rd-degree haemorrhoids	25	Moderate	3days	Headache, pain and acute urinary retention	No
7	Female	28	Bleeding, 3rd-degree haemorrhoids, constipation	3rd-degree haemorrhoids		Mild	Day case	No	No
8	Male	47	Bleeding, 3rd-degree haemorrhoids, constipation	4th-degree haemorrhoids	33	Moderate	Day case	No	No
9	Female	51	Bleeding, 3rd-degree haemorrhoids, constipation	3rd-degree haemorrhoids	90	None	Day case	No	No
10	Female	71	4th-degree haemorrhoids	4th-degree haemorrhoids	60	Mild	Day case	No	No
11	Female	47	4th-degree haemorrhoids	4th-degree haemorrhoids		Mild	Day case	No	No

evaluated, there is no consensus on the optimal treatment till date. Damage to the tissues around the anal region with its rich network of nerve endings makes open haemorrhoidectomy, an extremely painful procedure.^[14] One of the most commonly reported advantages of laser haemorrhoidoplasty is reduced postoperative pain.^[2,14-17] Others include reduced operating time and bleeding, shorter duration of healing, bactericidal effect, preservation of adjacent structures, and reduced incidence of stenosis.^[2,16]

While for several years, patients with haemorrhoids have been treated using laser, there are limited reports on its use in low-resource settings. Abdulkarim *et al.*^[18] reported

reduced postoperative pain scores and shorter operative time for laser haemorrhoidoplasty in Pakistan. This was similar to our findings with 73% of patients reporting mild postoperative pain scores and the rest having moderate pain scores, despite not administering narcotic parenteral analgesic as we do for traditional haemorrhoidectomy, and a median operating time of 33 min. An Egyptian study by Alsisy *et al.*^[16] comparing intrahaemorrhoidal diode laser treatment and Milligan–Morgan haemorrhoidectomy showed that laser coagulation was associated with reduced intraoperative bleeding, postoperative pain, and postoperative urinary retention, whereas Milligan–Morgan haemorrhoidectomy had a higher risk of anal stenosis.^[19]

Jahanshahi *et al.*^[20] also reported similar findings. The findings are similar in our study with minimal median estimated blood loss, reduced postoperative pain, and only one patient had urinary retention [Table 5]. Although a systematic review and network meta-analysis reported that transhaemorrhoidal dearterialization resulted in a shorter length of hospital stay than laser procedure,^[15] in our study, all procedures were done as day case except in one patient who was admitted postoperatively due to urinary retention and headache.

In our environment where patients with moderate symptoms decline surgery because of the fear of known and perceived complications, laser haemorrhoidoplasty with its documented benefits of fewer postoperative complications such as haemorrhage, pain, wound infection, anal stenosis, fistula, or recurrence may be more readily acceptable among patients with this condition.^[8,9] One major constraint to the widespread use of this method of treatment is additional cost of treatment when compared with the conventional open method. This is currently about \$30 for the laser fibre. In a country where over 90% of the population pay out of pocket for healthcare expenditure, with a high risk of catastrophic and impoverishing expenditure from healthcare, this is not cheap.^[21]

Conclusion

The advantages of laser haemorrhoidoplasty such as lesser postoperative pain, minimal bleeding, and shorter hospital stay as also revealed in our study make it a readily acceptable form of treatment for haemorrhoids in our setting. It is recommended that it should be further studied in our subregion.

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Conflicts of interest

There are no conflicts of interest.

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