Laser Hemorrhoidoplasty: Experience at Aga Khan University Hospital

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Summary

Background: Haemorrhoidal disease is the commonest benign anal condition diagnosed in the outpatient set-up. Interventional treatment options range widely from office-based procedures to haemorrhoidectomy. There is increasing use of laser technology in the field of proctology. We present our index clinical outcomes following laser haemorrhoidoplasty (LHP). Methodology: Retrospective cross-sectional study of 21 consecutive patients who underwent LHP between the year 2015 and 2018 under a single surgeon. Their outcomes were compared to a group of patients who underwent the standard open haemorrhoidectomy over the same period of time. Results: Post operatively, 85.7% of patients post laser haemorrhoidoplasty had a better pain scores (mild) compared to 66.7% in the open haemorrhoidectomy group. The mean operative time in minutes was shorter for LHP, 29.67±17.50 versus 39.20±20.77 in the open group. Duration of hospital stay in days between the two groups were similar; LHP group median=1(1-3), open group median =1 (1-3).

Conclusion: Laser haemorrhoidoplasty is associated with reduced pain scores and shorter operative time when compared to the open haemorrhoidectomy group. Duration of hospital stay were however similar in both groups. The rates of complications were observed to be high in the study group.

Key words: Laser haemorrhoidoplasty, Pain score, Complications, Open haemorrhoidectomy

Introduction

Haemorrhoidal disease is a common presentation at surgical outpatient clinics with an estimated worldwide prevalence of between 2.9 to 27.9% (1). Its management is associated with significant healthcare related costs (2). They can be classified as internal or external depending on their site of origin in relation to the dentate line. Internal haemorrhoids are further sub-classified from grade 1 to 4 depending on degree of prolapse and ease of reduction (3, 4).

Laser energy is a novel technique that has found increasing use in benign anal conditions (5). Probes are used to produce short high energy pulses of light that is transformed into heat energy when absorbed by nearby tissues. Its utility in haemorrhoidal disease management involves photocoagulating arterial feeding vessel to allow for shrinkage of the haemorrhoidal columns. Clinically, de-arterialization may be done with or without mucopexy or by use of Doppler assistance.

When compared to laser hemorrhoidoplasty and other treatment modalities, conventional haemorrhoidectomy is associated with increased operative time, post–operative pain and duration of hospital stay (6, 7). There is a paucity of data on outcomes and complications following laser use in management of symptomatic hemorrhoids in Africa. We present our early experiences with LHP at a teaching hospital and compare its outcomes with the standard of care.

Materials and Methods

This is a retrospective single centre observational study of 21 consecutive patients who underwent laser haemorrhoidoplasty under one surgeon from the year 2015 to 2018. We compared their outcomes with 15 patients who underwent open haemorrhoidectomy over the same period. Patients were evaluated at the clinic and booked for surgery if symptoms were refractory to conservative treatment. Both surgical options were offered pre-operatively and informed consent obtained. Intra-operatively, they were put in lithotomy position and examination under anaesthesia done to confirm columns involved and degree of severity based on Goligher’s classification.

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Patients undergoing laser hemorrhoidoplasty had a mucosal incision made at the distal end of the haemorrhoid and a size 980nm laser scope inserted into the submucosal space and advanced to the base of the haemorrhoid. Pulsed boluses of energy at 15 watts were released with confirmation of blanching of the haemorrhoidal tissue, up-to a total of 1200 watts. Where indicated, a mucopexy was done. The patients received a pudendal nerve block after the procedure. In the open hemorrhoidectomy technique, after examination under anaesthesia involved columns were noted and hemorrhoidal tissue grasped and retracted with tissue clamps to facilitate trans-fixation of the base of the pedicle. An elliptical incision was made over the perianal skin and further dissection done by scissors in the plane between hemorrhoidal tissue and fibres of the sphincter muscles. Hemorrhoidectomy was done upon reaching the vascular pedicle and the base of the wound inspected for any bleeding and hemostasis achieved.

Both procedures were done by a single surgeon with training in both techniques. Post operatively, patients followed a protocol that entailed pain control using pudendal block and regular standard non-opioid painkillers, laxatives and ice packs for those who underwent LHP or sit baths for those who were post open hemorrhoidectomy.

Pain scores were assessed every six hours by nursing staff and the mean pain score taken over the duration of patient stay. These were rated in degree of severity from 0 to 10. Mild score was assigned if score was between 0-2, moderate if 3-5 and severe if 6-10. Operative time was recorded in minutes and duration of hospital stay in days. Post-operative complications including recurrence, urinary outflow symptoms, infection and stool or flatus incontinence were described as rates. Recurrence was defined as presence of prolapsed tissue or persistence of post-operative bleeding with demonstrable haemorrhoids on anoscopy. Data was analysed by use of SPSS version 20.

**Results**

LHP was done on 21 consecutive patients of whom 10 were female and 11 were male with a mean age (years) of presentation at 39.29±8.730. The most common haemorrhoidal grade was 3 (66.7%) followed by 4(19%) then 2 (14.3%).

The open procedure had 15 patients of whom 6 were female and 9 were male. The mean age at presentation was 42.20±15.853. 9 patients (60%) had grade 4 haemorrhoids, 4(26.7%) had grade 3 while 2(13.3%) had grade 2 haemorrhoids (table 1).

<table>
<thead>
<tr>
<th>Table 1: Baseline characteristics</th>
<th>Laser hemorrhoidoplasty (n = 21)</th>
<th>Open hemorrhoidectomy (n = 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at presentation (mean± SD)</td>
<td>39.29 ± 8.730</td>
<td>42.20 ±15.853</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>10 (47.62 %)</td>
<td>6 (40.0%)</td>
</tr>
<tr>
<td>Male</td>
<td>11 (52.38%)</td>
<td>9 (60.0%)</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 2</td>
<td>3 (14.29%)</td>
<td>2 (13.33%)</td>
</tr>
<tr>
<td>Grade 3</td>
<td>14 (66.67%)</td>
<td>4 (26.67%)</td>
</tr>
<tr>
<td>Grade 4</td>
<td>4 (19.04%)</td>
<td>9 (60.0%)</td>
</tr>
</tbody>
</table>

After LHP the majority, 18 patients (85.7%) had mild pain scores, 1(4.8%) patient was classified as having moderate pain score and two (9.5%) had severe pain scores. The comparative open surgery group had 10(66.7%), 3 (20%) and 2(13.3%) with mild, moderate and severe pain scores respectively. Whereas the laser group had a lower mean pain score during their admission compared to the open group, this was not statistically significant (1.05 vs 2.00, mean difference -0.952, CI -2.704 - 0.799, p= 0.277).

The mean operative times were shorter in the LHP group (29.67 +17.50 vs 39.20+20.77 minutes). The median number of days admitted to the ward were similar in both groups, LHP 1 day (1-3), open group 1 day (1-3). In the LHP group, there was a strong positive correlation between recorded pain scores and duration of hospital stay r=0.761 N=21 p<0.005 and operative time and duration of hospital stay r=0.761 N=21 p<0.005

Complications were observed more frequently in the laser group 33.3% versus 20.0%. In the laser group, a higher proportion of patients had recurrence of symptoms compared to the open group (9.5% vs 6.7%, OR= 2.33, 95% CI 0.218-24.923, p= 0.483). The same trend was also seen in proportion of patients with urinary outflow complications (9.5%, vs 6.7%, OR= 1.474, 95% CI 0.121-17.913, p= .761) and those who complicated with infection (4.8% versus 0%). Both groups had no reported cases of stool or flatus incontinence.

On further analysis, multilinear regression showed no relationship between grade of haemorrhoid(p=0.571), type of surgical intervention(p=0.796) and development of any complication (F (2,20) =0.180, p=0.837) R² = 0.018 (table 2).
Table 2: Outcomes in laser hemorrhoidoplasty and open hemorrhoidectomy groups

<table>
<thead>
<tr>
<th></th>
<th>Laser (n=21)</th>
<th>Open (n=15)</th>
<th>OR</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain score categories</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>18 (85.7%)</td>
<td>10 (66.67%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Moderate</td>
<td>1 (4.8%)</td>
<td>3 (20.00%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>2 (9.5%)</td>
<td>2 (13.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean pain score</td>
<td>1.05</td>
<td>2.00</td>
<td>-</td>
<td>0.277</td>
</tr>
<tr>
<td>Mean operative time</td>
<td>29.67±17.50</td>
<td>39.20±20.77</td>
<td>-0.146</td>
<td></td>
</tr>
<tr>
<td>Median duration of hospital stay</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rate of infection</td>
<td>4.8%</td>
<td>0%</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Rate of recurrence</td>
<td>9.5%</td>
<td>6.7%</td>
<td>2.33</td>
<td>0.483</td>
</tr>
<tr>
<td>Rate of urinary complications</td>
<td>9.5%</td>
<td>6.7%</td>
<td>1.474</td>
<td>0.761</td>
</tr>
</tbody>
</table>

Discussion

The exact pathophysiology of haemorrhoidal disease is yet to be clarified could be multi factorial in etiology (8). Several theories exist these include disintegration of the anchoring supporting tissue of anal cushion (9), increased inflammatory activity in prolapsed tissue (10), increased calibre and flow of terminal branches of superior rectal artery (11) or Increased neo-vascularisation from endoglin and CD 34 expression (12).

It is with this understanding that led to development of management strategies to treat symptomatic haemorrhoidal disease. Goals of operative treatment include decreasing vascular inflow and reducing redundant tissue by excision or by fixing haemorrhoidal tissue to the rectal wall. Conventional hemorrhoidectomy remains the standard of care with respect to long term patient outcomes (13, 14).

However, compared to the less invasive methods of treatment, its use is associated with high post-operative pain scores and slower return to work (14, 15)

Laser hemorrhoidoplasty as described by Dal Monte et al has an efficacy of up to 92% in symptomatic grade two to four haemorrhoids. (16). Its use is associated with short hospital stay and mild post-operative pain (17). This was consistent with our findings when we noted a median hospital stay of one day and a majority of patients (85.7%) having mild pain scores post-operatively. 9.5 % of patients who underwent laser hemorrhoidoplasty had severe pain scores as compared to 13.3%. One patient had thrombosed external haemorrhoids that required re-operation two weeks later and the other had an ineffective caudal block. We subsequently changed our protocol to intervene only in patients with internal haemorrhoids and we adopted pudendal blocks as a modality of post-operative analgesia.

Operative time was short as compared to those who underwent open hemorrhoidectomy. This finding was consistent with the findings by Simillis et al and Alisy et al. Both noted decreased operative time when comparing laser hemorrhoidoplasty to open hemorrhoidectomy; this could be explained by the increased operative bleeding observed in the latter group (14, 18). In our study, however we did not look at intra-operative blood loss and its correlation to operative time between the two groups.

Duration of hospital stay was similar in both laser and the comparative group. This was at variance to shorter hospital stay when comparing laser to conventional hemorrhoidectomy in grade 3 (19), or grades 3 and 4 hemorrhoids (14). This finding can be explained by the skewed data in patients who underwent LHP without pudendal blocks subsequently developed higher pain scores post-operatively necessitating longer hospital stays. Longer operative times associated with the learning curve of a new procedure also explained the unexpected longer hospital stay.

This was in keeping with a strong positive correlation between intra-operative time and pain scores with duration of hospital stay observed in the LHP group. These correlations were not seen in the open haemorrhoidectomy group.

Complication rates were observed to be higher in the laser group. In the LHP group we noted high recurrence rates compared to the open group. Giordano et al, in his systematic review of Doppler assisted trans-anal haemorrhoidal de-arteralization showed an overall recurrence rate of 9% (17). This value approximated our recurrence rate of 9.5%. One patient had wound discharge that was treated conservatively and resolved within a week. There were no patients with wound infections in the comparative group. Grade of haemorrhoid and type of surgical intervention did not predict development of any complication on further analysis.

Limitations in our study include small number of reviewed cases that could have influenced results obtained from statistical testing. Further studies are needed to explore the emerging themes and compare laser hemorrhoidoplasty and other less invasive methods in our set-up.

Our experience is that LHP use is associated with less proportion of patients with severe pain scores and shorter operative time. Duration of hospital stay was similar between the two groups however; recurrence rates and wound complications are higher when compared to conventional hemorrhoidectomy.

Conclusion

Laser hemorrhoidoplasty is associated with less pain scores and shorter operative times however patients have to be counselled on possibility of higher complication rates as compared to conventional hemorrhoidectomy. We propose...
routine use of pudendal nerve block to provide post-operative analgesia.

References