Doppler Guided Haemorrhoidal Arterial Ligation with recto-anal-repair (RAR) for the treatment of advanced haemorrhoidal disease.

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Abstract

AIM: A modification of haemorrhoidal artery ligation (DGHAL) to include the addition of recto-anal repair is reported. Preliminary results of function and safety of third and fourth degree haemorrhoids are given. METHOD: Thirty patients underwent DGHAL combined with RAR. Each had rectal examination, anorectal manometry and Quality of Life assessment before and three months after the procedure.

RESULTS: Twenty-nine patients were included in the final analysis. There were three (10.34%) cases of intraoperative and one (3.45%) of postoperative bleeding. Three months after RAR (17.24%) cases with minor residual mucosal prolapse were detected, and three (10.34%) patients reported residual symptoms. There was no case of recurrent bleeding. Anal manometry at three months after RAR were significantly lower than before the procedure (p<0,05). One (3.45%) patient reported occasional soiling three months after RAR.

CONCLUSION: RAR is safe in treating third and fourth degree haemorrhoids with no major complications and low rate of residual disease.

Keywords

Recto-Anal Repair, haemorrhoids, haemorrhoidal disease, anorectal manometry, anal pressure, haemorrhoidal artery ligation

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Introduction

Haemorrhoids are supplied by six haemorrhoidal arteries, which are located most frequently in the 1, 3, 5, 7, 9 and 11 o’clock position [1, 2]. Morinaga et al. described a new method of treatment of haemorrhoidal disease based on haemorrhoidal artery ligation guided by a Doppler flowmeter [3]. The aim was to preserve the haemorrhoidal plexuses and overlay mucosa. The method has been popular for the treatment of second and third degree haemorrhoids and has been recommended for its simplicity and low risk of complications [4]. The recurrence rate for fourth degree haemorrhoids is significantly higher in patients treated with DGHAL than by haemorrhodectomy [5], and standard DGHAL does not address the issue of prolapsed mucosa, although the procedure rarely causes complications and can be repeated. Modification of DGHAL to deal with mucosal prolapse is an attractive possibility and might lead to a wider use of DGHAL for grade four haemorrhoids [4].

The most recent modification of selective haemorrhoidal artery ligation, Recto–Anal Repair, combines selective DGHAL with plication of the prolapsed rectal mucosa, using a specially designed proctoscope (A.M.I., Austria) (Fig. 1). Instead of excising the haemorrhoid, the procedure aims to reduce its size by ligation of the supplying arteries and to restore the anatomical position of prolapsed mucosa. This method has been used in our department since 2006, as a part of a multicenter clinical study. The study aimed to assess the new technique and report the preliminary results of function and safety.

Method

The study had been positively approved by the Bioethics Committee. Thirty patients, (19 male, 11 female, of average age of 53 years (29-73 years)), with symptomatic 3rd and 4th degree haemorrhoids were entered in the study. Each patient had a rectal examination, endoscopic and endorectal ultrasound, anorectal manometry and a Quality of Life assessment (GIQL, FIQL) by the inclusion criteria which were as follows: haemorrhoidal disease with prolapsing haemorrhoids of 3rd or 4th grade, no history of faecal incontinence, normal anal ultrasound, normal colonoscopy and the patient’s written consent to participate in the study. Besides prolapse, the chief complaints on admission were bleeding (86.67%), itching (70.00%) and pain on defecation (66.67%). The patient was operated in the Lloyd-Davis’ position. The first stage of the operation consisted of standard Doppler Guided Haemorrhoidal Artery Ligation (DGHAL) using an A.M.I. DGHAL-RAR proctoscope. The proctoscope consisted of a modified DGHAL probe and a specially designed proctoscope tube, with a 5cm longitudinal opening. The haemorrhoidal arteries were detected by the Doppler flowmeter device built into the proctoscope, and were ligated with an absorbable suture (polyglycan 2/0), using a figure-of-eight suture, as described by Scheyer et al. [5] (Fig.
2). After all detectable arteries had been ligated (no detectable arterial signal), the second part of the procedure was carried out. The proctoscope was placed in the anal canal with the longitudinal opening held in the “closed” position, with the probe window placed over the selected haemorrhoid. The longitudinal opening of the proctoscope was gradually opened, from proximal to distal to allow the placement of a continuous suture on the prolapsed mucosa (Fig. 3). The suture covered the mass of the haemorrhoid and was tied and then this lifted the haemorrhoid proximally into its anatomical position (Fig. 4). The procedure was repeated for each prolapsed haemorrhoid until no more prolapsed mucosa was visible outside the anal canal. After the operation patients were kept in the ward for 24 hours of observation and then discharged home. NSAIDs (ketoprofen) were given for pain on demand to a cumulative dose up to 300 mg daily. Pain intensity was measured on day one and day seven using a Visual-Analog-Scale, from 0 (no pain) to 10 (maximal pain). Three months after surgery each patient had a rectal examination, anorectal manometry and Quality of Life assessment by questionnaire.

Wilcoxon Matched Paired test, and the Kruskal-Wallis ANOVA tests were used for the statistical analysis of data.

Results

Twenty-nine patients were included in the final analysis, as one patient, a 75 year old male, was lost to follow up. The RAR procedure itself took an average of 35 (25-75) minutes. The mean number of arteries ligated was 5.45 (4-9). An average of 2.41 (1-4) longitudinal sutures were used. There were three (10.34%) cases of intraoperative bleeding requiring additional haemostatic sutures. Postoperative bleeding of approximately 60 ml of blood was reported in one (3.45%) patient day one. There were no other postoperative complications requiring surgical intervention. Postoperative pain was easily managed by NSAIDs. On day one the mean VAS pain score was 5.4. After the first five procedures the postoperative pain control was revised. This was followed by improved pain control (VAS 1-3). The pain score on day seven was 1.4.

At the follow-up examination three months after RAR there were five (17.24%) cases of minor residual haemorrhoidal prolapse and only three (10.34%) patients reported residual symptoms such as pain on defecation and itching. These three patients were among the first 10 patients treated by recto-anal repair. There were no cases of persistent bleeding within the first three months postoperatively.

Anal pressure levels recorded three months after RAR (Table 1) were significantly lower than before the procedure (average fall of 11.97%, SAP 6.22%, p<0.05). These results were not correlated with age or gender or degree of haemorrhoid (p>0.05).

Based on the responses to the Quality of Life questionnaires (GIQL, FIQL), most of the patients (96%) were satisfied with the treatment, reporting better overall wellbeing and self-confidence, even if mucosal
prolapse had not completely resolved in a few cases. One (3.45%) patient 73 year old male, reported occasional continence at three months which started about one month after surgery. A change of diet and simethicone administration three times a day were sufficient to relieve the symptoms.

**Discussion**

There is a constant search for new methods of treating haemorrhoids which would offer not only high effectiveness and low morbidity but also short recovery with little pain. Rubber band ligation used for stage II and III haemorrhoids is followed by bleeding in up to 5% of cases[6]. Its efficacy is around 75% in stage II, 66% in stage III, and less then 20% in IV degree haemorrhoids. The rubber band ligature is placed under limited vision, near the dentate line leaving haemorrhoidal arteries unlitigated, resulting in a high probability of recurrence[7]. With DGHAL-RAR all sutures are placed under direct vision. Moderately invasive methods such as the PPH are followed by complications, which occasionally are severe complications such as perforation, rectal obstruction, retroperitoneal hematoma, and Fournier’s gangrene[8-13]. Additionally, a mucosal ring is removed, while in DGHAL-RAR there is no such risk. Milligan Morgan or Ferguson haemorrhoidectomy and their modifications is the most effective treatment for haemorrhoids. However, these methods are followed by complications including sphincter dysfunction, recto-anal coordination impairment due to partial resection of the anal mucosa, postoperative bleeding or infection [12]. Recovery can last several weeks. Taking all this into consideration, new methods of treatment such as DGHAL and RAR, besides improving effectiveness, aim to preserve the structure of the anorectal region.

The clinical results of the recto-anal repair procedure are very promising. Most of the patients in the present study were satisfied with the outcome, although the follow-up period of three months is too short to draw firm conclusions. The results of stapling techniques show lower recurrence rates than DGHAL/RAR [14-17], but the latter may be safer. Additionally, recovery after RAR procedure is much quicker than after Milligan-Morgan or Ferguson haemorrhoidectomy[18].

**Conclusion**

Recto-anal repair is safe for the treatment of 3rd and 4th degree haemorrhoids with no major complications and a high rate of satisfactory short term results. Further assessment in larger studies is required.

**Literature:**


Figure captions

Fig. 1: A.M.I. DGHAL-RAR proctoscope
Fig. 2: Figure-of-eight stitch over a haemorrhoidal artery
Fig. 3: Longitudinal suture, covering the whole mass of a prolapsed haemorrhoid
Fig. 4: Haemorrhoid lifted back into its anatomical position by tying the suture
Table 1. Manometric (mm Hg) findings before and at three months after DGHAL-RAR

<table>
<thead>
<tr>
<th></th>
<th>Mean BAP before</th>
<th>Mean BAP 3 months after</th>
<th>Mean SAP before</th>
<th>Mean SAP 3 months after</th>
<th>RAIR (before/3 months after)</th>
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<tr>
<td>Male</td>
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<td>66,44</td>
<td>207,16</td>
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<tr>
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<td>62,82</td>
<td>54,73</td>
<td>140,45</td>
<td>128,18</td>
<td>11/11</td>
</tr>
</tbody>
</table>

BAP – Basal anal pressure
SAP – Squeeze and pressure
RAIR – Rectoanal inhibition reflex