Early Experience of Doppler-Guided Hemorrhoidal Artery Ligation and Rectoanal Repair (DG-HAL & RAR) for the Treatment of Symptomatic Hemorrhoids

Departments of Surgery, Seoul Red Cross Hospital, Ewha Womans University School of Medicine, Seoul, Korea

SungWook Cho, M.D., RyungAh Lee, M.D.¹, SoonSup Chung, M.D.¹, KwangHo Kim, M.D.¹

Purpose: This study is to introduce our preliminary experience of the Doppler-guided hemorrhoidal artery ligation and Rectoanal repair (DG-HAL & RAR) as a new treatment for symptomatic or prolapsed hemorrhoids.

Methods: A Doppler probe incorporated proctoscope was inserted under the lithotomy position and the location of the hemorrhoidal artery was identified. The identified artery was ligated as a ‘figure of eight’ method with an absorbable suture into the submucosa. Then the prolapsed hemorrhoidal pile was lifted at the rectal mucosa by continuous suture to 5 mm above the dentate line and tied. The procedure was repeated at the 1, 3, 5, 7, 9, and 11 o’clock positions. We evaluated post-operative hospital stay, degree of pain, time to return to work, and recurrence.

Results: The patient’s mean age was 50.2±15 years old and the mean follow-up time was 415±75 days. The constitution of the type of internal hemorrhoids was as follows: Grade II: 13, Grade III: 16, and Grade IV: 5. The mean operation time was 35 minutes and post-operative hospital stay was 1.4 days. The mean time it took to return to work was 1.8 days. There were no severe pains requiring injection of analgesics or other severe complications. So far, 2 patients have had recurrence of symptoms.

Conclusion: The DG-HAL & RAR is a safe and less painful procedure. The DG-HAL & RAR is an effective alternative for the treatment of symptomatic or prolapsed hemorrhoids. (J Korean Surg Soc 2010;78:23-28)

Key Words: Symptomatic hemorrhoids, Doppler-guided hemorrhoidal artery ligation, Recto-anal repair

INTRODUCTION

Since Dr. Morinaga first introduced a method of treatment for hemorrhoids by using a Doppler scope to find and ligate the vessels supplying the hemorrhoidal pile (Doppler-guided hemorrhoidal artery ligation, DG-HAL) in 1995, there have been many studies about this technique.¹

As most studies report that the DG-HAL results in minimal postoperative pain with less than 10% recurrence rate and over 90% patient satisfaction, it is being widely used in Europe and Japan as an alternative procedure to conventional hemorrhoidectomy.¹⁻³

However, most of the studies have been based on Grade II and III internal hemorrhoids that show the symptoms of bleeding and discomfort.⁴ As for symptomatic Grade IV hemorrhoids with prolapse, the DG-HAL has its limitations. With the DG-HAL, symptoms such as bleeding may improve shortly after surgery. But the improvement of prolapse is difficult as it takes long time for the hemorrhoidal pile to shrink. Also, this treatment is difficult to apply to the prolapsed cases occurred by the destruction of anchoring connective tissue in the anal cushion.
We tried combining mucopexy (Recto-anal repair, RAR) with the DG-HAL as a treatment procedure for such symptomatic hemorrhoids and describe the results of the DG-HAL & RAR technique.

**METHODS**

Thirty four patients who underwent the DG-HAL & RAR after being diagnosed with hemorrhoids at our institution from November 2007 to March 2009 were prospectively analyzed. Surgical indications were Grade II-IV internal hemorrhoids with symptoms of bleeding, prolapse, or pain. Patients with other anal problems such as anal fistulas or anal fissures were excluded from this study. Most of patients underwent spinal anesthesia, but some underwent general anesthesia according to the patient’s preferences. Patients were placed in the lithotomy position during surgery.

First, an anoscope with an incorporated Doppler probe was inserted into the anus with a specially made sleeve, and the superior hemorrhoidal artery was identified with the Doppler probe (Fig. 1). The detection of the branch of the superior hemorrhoidal artery was confirmed by a sound from the Doppler probe and an image display on the monitor. Ligation of the artery was carried out through the window of the anoscope with a figure-of-eight suture using vicryl #2-0. Correct ligation of the artery was confirmed by absence of the Doppler sound, and a knot-pusher was used to tie a knot. Up to this point, the surgery is identical to the DG-HAL procedure.

After ligation of the artery, the anoscope was repositioned to expose the prolapsed hemorrhoidal pile through the space between the anoscope and sleeve. Continuous running suture using vicryl #2-0 was performed from the location of hemorrhoidal artery ligation to 5 mm above the dentate line and then tied in order to lift the hemorrhoidal pile towards the rectal mucosa, correcting the prolapsed (Fig. 2). The same procedure was repeated in 6 positions (1, 3, 5, 7, 9, 11 o’clock) of the anus. The surgery was terminated after confirming no more prolapsed hemorrhoidal pile.

We evaluated postoperative hospital stay, degree of pain, operation time, recovery time that patient goes back to normal life, complications, and recurrence. Preoperative and postoperative pain was compared using a 10-point pain scale (0 = no pain; 10 = extremely painful). We also asked the degree of satisfaction with the operation results and whether they would recommend this procedure to others.

![Fig. 1. Anoscope with an incorporated Doppler probe and sleeve.](image)

![Fig. 2. Schematic illustration of the Rectoanal repair (mucopexy).](image)

**Table 1.** Operation related pain score

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<tr>
<td>Pre operation</td>
<td>1.8 (0~7)</td>
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<tr>
<td>Post operation 2 hours</td>
<td>3.9 (0~8)</td>
</tr>
<tr>
<td>Post operation 7 days</td>
<td>1.0 (0~6)</td>
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*Preoperative and postoperative pain was compared using a 10-point pain scale (0 = no pain; 10 = extremely painful).