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## Hemorrhoid artery ligation and recto-anal repair treatment for hemorrhoid: a case series



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Christinawati Angelita Pusparani,<sup>1\*</sup> Sugiharto Purnomo<sup>2</sup>

### ABSTRACT

**Introduction:** Hemorrhoidal artery ligation (HAL) combined with recto-anal repair (RAR), is an alternative technique for the treatment of hemorrhoid disease from grade I to IV. HAL-RAR involves anoscope with a Doppler to identify the position and depth of rectal arterial, which can be selectively ligated 3-4 cm above the dentate line. This technique has been proposed as a practical, easy to learn, minimally invasive, and safe.

**Case:** 5 cases in Husada Hospital Central of Jakarta with hemorrhoid grade IV underwent HAL-RAR. The initial result, 14<sup>th</sup> day post-operative follow up, early benefits, and postoperative complications that most

affected by HAL-RAR technique will be analyzed. Treatment confirmed 5 cases showed less postoperative pain measured by visual analog scale (VAS), fewer complications, on the 14<sup>th</sup> day follow up the main complication there was only one case with residual protrusion in initial follow up resolved four weeks later, and well-controlled of manifestation. All patients were satisfied with the result.

**Conclusion:** HAL-RAR is an easy to learn technique, useful to perform, less post-operative pain, and gives fewer complications as treatment of advanced hemorrhoid disease. But, needed more cases and a longer follows up to analyze the late complications and recurrence.

**Keywords:** hemorrhoids, artery ligation, recto-anal repair, doppler

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<sup>1</sup>Faculty of Medicine, Universitas Katolik Atma Jaya

<sup>2</sup>Department of General Surgery, Husada Hospital, Central of Jakarta, Indonesia

### INTRODUCTION

Hemorrhoids act as normal anatomy in the anal canal, consist blood vessels, connective tissue, and a small amount of muscle that function as a part of the continence mechanism and for complete closure of the anal canal at rest. Main cushions lie in the left lateral, right anterior, and right postero-lateral area. Hemorrhoids were becoming a disease if manifest with any of these symptoms, such as bleeding during or after defecation, pain, prolapse, anal swelling, discomfort, hygiene problems, pruritus, and peri-anal soiling. Many individuals experience these conditions without seeking medical consultation, because of embarrassment or fear associated with the treatment, so the exact incidence cannot be estimated accurately. The prevalence of hemorrhoid disease estimated as 4.4% of U.S. adults, with the highest prevalence in those between 45 and 65 years of age. Predisposition factors that increase intra-abdominal pressure contribute to dilatation, engorgement, and prolapse of hemorrhoidal vascular tissue such as straining, constipation, diarrhea, long sitting in a toilet, obesity, heavy lifting, and pregnant. Surgical intervention is necessary to treat 5-10% of patients with symptomatic hemorrhoids. Most patients who treated conservatively experienced resolution, but the recovery period prolonged with a higher rate of recurrence, compared with patients who were treated surgically. Surgery can be done based on the type and the degree of

hemorrhoid.<sup>1-6</sup> For the patient who presents with grade IV hemorrhoids, surgery is the initial treatment.<sup>7</sup> HAL-RAR is an alternative technique for the treatment of hemorrhoids grade I to IV. The early results were promising, lower pain scores than hemorrhoidectomy, with a minimally invasive procedure. HAL-RAR involves an anoscope with a Doppler transducer allowing to identify the position and depth of superior rectal arterial branches, which can be selectively ligated 3-4 cm above the dentate line.<sup>6-10</sup> The purpose of this case series study is to identify the initial and 14<sup>th</sup> day of follow up results, early benefits, and complications that most affected by HAL-RAR.

### CASE REPORT

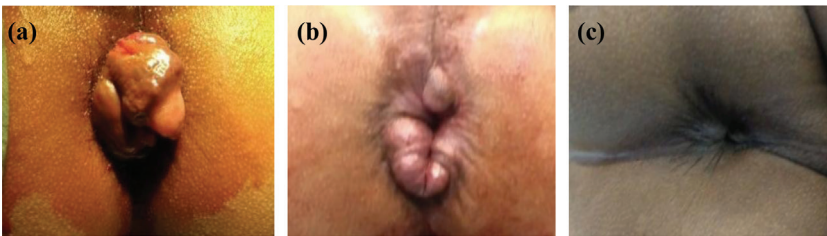
#### Preoperative and patient selection

During period from March 2019 to May 2019 in Husada Hospital, Centre of Jakarta, 5 cases with hemorrhoid grade IV underwent HAL-RAR. In this case series, 2 cases were males, and 3 cases were female, the youngest patient was 35 years old and the eldest was 65 years old, the average age was 47 years. General anesthesia was used in all cases. The bowel was prepared and the rectum was emptied at least 2 hours preoperatively. In all cases, antibiotics were used as prophylaxis injection antibiotics and analgesic. All of the instrument used can be seen in [figure 1](#).

\*Correspondence to:  
Christinawati Angelita Pusparani,  
Faculty of Medicine, Universitas  
Katolik Atma Jaya  
[angelitapusparani@gmail.com](mailto:angelitapusparani@gmail.com)



**Figure 1** The material and the HAL-RAR procedure



**Figure 2** Preoperative (a); initial operative result (b); and 14<sup>th</sup> day of follow up (c) of hemorrhoid grade IV in the same patient



**Figure 3** Preoperative (a); initial operative result (b); and 14<sup>th</sup> day of follow up (c) of hemorrhoid grade IV in the same patient

### Operative technique

Patients were operated by one experienced digestive surgeon. Patient was placed in the lithotomy position. With 2 fingers using a generous amount of xylocaine gel around the anus and perianal region, then dilated the anal sphincter gently. The HAL's anoscope inserts fully, starting at 3-4 cm above the dentate line, the Doppler transducer was used to locate the significant pulse of the arterial signals with slow rotating movements. When it is significantly located, ligate the artery with figure of 8 or two stitches before tying the knot in case of persisting arterial signals, with 5/8 needle, Vicryl 2.0 and a knot pusher was used to tie the ligature.

The anoscope is provided with a slotted window, primary closed and gradually opened the window, enabling the surgeon to place a suture in the ligation window. Put the window towards the prolapse so that the prolapsed area can be seen. The suture placed continuously from proximal to distal, bind the arteries responsible for congestion and manifestations, selectively and reduce the blood flow and collapsing hemorrhoids. The hemorrhoidal plexus is lifted and fixed in the anatomically correct region with immediate visual improvement. The anoscope was then completely removed.

### Post-operative and Follow up

In all cases, analgesics medicines were prescribed orally for 5 days. During the first few days, they received laxatives and aridium for stool regulation and more comfortable defecation and to avoid straining. All cases also will identify the initial after the procedure and 14<sup>th</sup> day of follow up results, early benefits, and complications of HAL-RAR. Patient's anal pain will be assessed by the visual analog scale (VAS) and the actual manifestation.

### Operative result

The median sutures were applied in average total 5-7 ligatures to significantly reduce the pulsations. The higher the grade, the more ligatures had to use in order to achieve optimal result. (Figure 2a and 2b, and 3a and 3b).

### Postoperative pain

All 5 patients were taken analgesic within first 5 days. Postoperative pain is easily relieved by analgesics and quickly to resolve.

### Postoperative complications

Treatment showed less postoperative complications. The major complication is the tissue edema after surgical trauma, which resolves later on.

### 14<sup>th</sup> day of follow up

The patients were called for follow up after 14<sup>th</sup> day postoperative. All 5 patients were satisfied with the result with well-controlled manifestation. The main manifestations before the surgery were bleeding during or after defecation, pain, prolapse, discomfort, hygiene problems, and peri-anal soiling. Patient confirmed less anal pain, measured subjectively by visual analog scale (VAS), all cases within number 1 as the scale of the anal pain. No impairment of continence, no bleeding during or after defecation, less discomfort, no hygiene problems, and no peri-anal soiling. The main complication on the 14<sup>th</sup> day was residual protrusion in 1 case and resolved on 4 weeks later (Figure 2c and 3c).

## DISCUSSION

The best surgical choice to treat symptomatic hemorrhoid disease must include: well tolerated for the patient, full remission of the symptoms, less post-operative complications, recurrence, and re-establishing the regular rectal anatomy. HAL-RAR is a minimally invasive technique that detects arteries and placing suture around and binds the responsible arteries for congestion and manifestations. The technique selectively reduce the blood flow, collapsing, and shrinking the hemorrhoids. The sutures were above the dentate line, pain-free area. In order to achieve the most effective reduction in preoperative hemorrhoidal symptoms, ligation has to be carried out carefully during HAL procedure, and the higher grade of hemorrhoids also need more ligatures. The second step is to perform RAR to fixed and repositioning the hemorrhoids into the anal canal. Because hemorrhoid still normal anatomy in the anal canal, to help the anal tone and continence. They will atrophy, and fibrosis at the posterior will keep them in their natural position, preventing a recurrence. RAR offers better for the hemorrhoid grade III and IV.<sup>11-18</sup> The painless concept of HAL-RAR technique helps an early recovery and allows an ambulatory procedure. Early complications are rare, and when present the complications are minor.<sup>12,13,16-18</sup>

The result of HAL-RAR in this case series shows that post-operative pain is easily relieved by analgesics and quickly to resolve, in 14<sup>th</sup> day follow up the postoperative anal pain was very low (number 1 at VAS scale), no impairment of continence and no previously manifestation that appeared. These follow up are some reason that makes the HAL-RAR a minimally invasive technique. One case appeared the residual protrusion on day 14<sup>th</sup> but resolved 4 weeks later. A major limitation of this case series study is needed more cases and a longer follow up to identify any late prolapse and recurrence.

## CONCLUSION

In our case the HAL-RAR technique provides a satisfying result and fast recovery.

## CONFLICT OF INTEREST

Authors have no conflict of interest to this case series.

## AUTHOR CONTRIBUTIONS

Study concept and design: Christinawati Angelita Pusparani, Sugiharto Purnomo.

Analysis and interpretation: Christinawati Angelita Pusparani, Sugiharto Purnomo.

Study supervision: Sugiharto Purnomo.

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