

# Endoscopic Ligation as a Treatment for Hemorrhoidal Disease

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## ABSTRACT

**Introduction:** Among the procedures for the treatment of hemorrhoids, band ligation is the most commonly used. In this study we present our experience performing this procedure with the visual aid of the colonoscope and the 6 Shooter® Universal Saeed® Multi-Band Ligator.

**Objective:** To analyze the benefits of endoscopic ligation of internal hemorrhoids unresponsive to conventional treatment.

**Design:** Retrospective, descriptive, observational study.

**Material and methods:** The records of all patients with symptomatic grade I to III hemorrhoids without response to conventional treatment were reviewed. Those who underwent ligation between February 2015 and February 2020 were included. In all cases the procedure was performed in the endoscopy suite with the patient sedated and monitored by an anesthesiologist.

**Results:** One hundred-forty-six patients (92 men) underwent the procedure. The mean age was  $44 \pm 11.23$  (21-78) years. The mean duration of the procedure was  $12.38 \pm 2.98$  (6-19) minutes. On a scale of 1-10, patients gave the pain symptom an average score of 4 at 24 hours, 1.5 at 7 days, and 0 at 30 days. Three patients had acute urine retention and 3 had external thrombosis. No patient had fever, sepsis, or perforation.

**Conclusion:** Endoscopic ligation is a safe and reproducible technique that allows the treatment of symptomatic grade I to III hemorrhoids usually in a single session..

**Key words:** Hemorrhoidal Disease; Endoscopy; Ligation

## INTRODUCTION

Conditions related to hemorrhoids are among the most frequent causes of coloproctological consultation.<sup>1</sup> The most frequent clinical presentation is characterized by painless bleeding with defecation, that may be accompanied by prolapse of the hemorrhoidal tissue.<sup>2</sup> Hemorrhoids are classified according to their location in internal (above the dentate line and covered by anal mucosa), external (below the dentate line and covered by anoderm) and mixed.<sup>3</sup> In turn, internal hemorrhoids are classified by the degree of prolapse. The practical interest in the classification of hemorrhoids is based on individualizing the management that will most benefit the patient. It can be a conservative, instrumental or surgical treatment.<sup>4</sup>

Among the instrumental treatments offered, rubber band ligation is the most widely used since it has the lowest rates of symptoms recurrence and need for re-treatment.<sup>5</sup> It is relatively safe and painless. It is performed on an outpatient basis and consists of placing the bands above the dentate line strangling the hemorrhoid, leaving a small amount of connective tissue where the scar fixes the mucosa to the submucosa and no new hemorrhoidal tissue develops.<sup>6,7</sup>

However, achieving the correct position of the band

at the base of the hemorrhoid or over the bleeding site, away from the dentate line, with the patient awake in the office, may require a high degree of expertise and be uncomfortable for the patient.<sup>2</sup>

Band ligation using an endoscope was initially described for the treatment of esophageal varices by Stiegmann in 1989.<sup>8</sup> More than 10 years later, the group of Trowers et al.<sup>9</sup> described the use of this technique in a reproducible and safe way for hemorrhoids. They reported no recurrence in 19/20 (95%) patients after a 5-month follow-up. In the same year, Sadahiro et al.,<sup>10</sup> demonstrated that the visualization of the anal canal with the colonoscope in retroflexion facilitated the identification of findings related to bleeding and hemorrhoidal prolapse.

In the present study we contribute our experience performing this procedure with the visual aid of the colonoscope, using the 6 Shooter® Universal Saeed® Multi-Band Ligator. Our main objective is to analyze the benefits of endoscopic ligation of grade I to III internal hemorrhoids unresponsive to conventional treatment, carried out at a private hospital in Panama City.

## MATERIAL AND METHODS

The clinical records of all patients with symptomatic hemorrhoids who underwent endoscopic ligation between February 2015 and February 2020 by the same surgical group were retrospectively and observationally reviewed. Inclusion criterion was patients with symptomatic I to III

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hemorrhoids without response to conventional treatment. Exclusion criteria were grade IV hemorrhoids, complicated hemorrhoids with indication of surgical treatment, and grade I to III hemorrhoids with external component. In all cases the procedure was performed in the endoscopy suite, with the patient sedated and monitored by an anesthesiologist. Demographic data, co-morbidities, indication for the procedure, duration, type of ligation used, post-procedure pain and bleeding (at 24 hours, 7 and 30 days) and complications were registered.

### Statistical analysis

For the statistical analysis, SPSS® version 21 was used. For the description of the data, the mean and standard deviation (SD) were used for the quantitative variables and frequency and percentage for the qualitative variables.

## RESULTS

The procedure was performed in 146 patients, 92 (63%) men, with a mean age of  $44 \pm 11.23$  (21-78) years. The most frequent indication was bleeding (72.6%) (Table 1).

The mean time to perform the procedure was  $12.38 \pm 2.98$  (6-19) minutes.

In 120 patients, common ligatures were used, in 22 Wilson Cook, in 3 Smart Bands, and one patient received Marflow AG (Fig. 1).

According to the Verbal Numerical Pain Scale (1-10), patients gave pain an average score of 4 at 24 hours after the procedure and of 1.5 at 7 days (Table 2).

After the banding, half of the patients had minor bleeding for 14 days. The 7th day was the one with the most bleeding. All patients had a feeling of tenesmus the day after the procedure and 79% of them still presented it after 7 days. Thirty days later, only three patients continued with this symptom (Table 2). Among the complications evaluated, 3 (2%) patients presented acute urine retention and 3 external thromboses. None had fever, sepsis, or perforation during retroflexion.

## DISCUSSION

Hemorrhoids are the most prevalent anorectal pathology in the Western world (approximately 4%) and are a very common cause of consultation for chronic bleeding.<sup>11</sup> In patients with grades I to III hemorrhoids, conservative treatment and nonsurgical procedures are recommended.<sup>12</sup> It is usually a pathology of young people, mean age 47 years informed in the literature and the male gender is the most affected, all this consistent with our series.<sup>13</sup>

Non-surgical treatment of hemorrhoids includes rubber

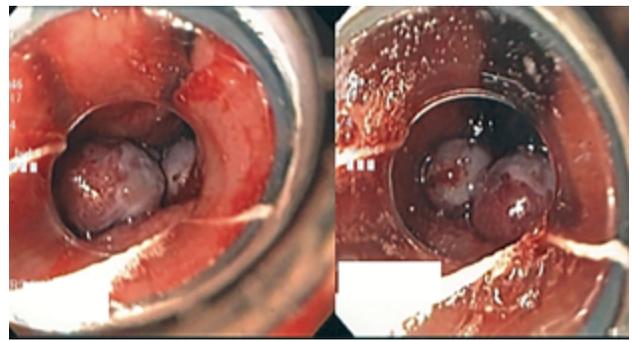


Figure 1: Endoscopic ligation of internal hemorrhoids.

TABLE 1: DEMOGRAPHIC AND CLINICAL DATA OF THE 146 PATIENTS WITH HEMORROIDS.

Age (years) mean±SD (range)	44 ±11.23 (21-78)
Gender, n (%)	
Male	92 (63)
Female	54 (37)
Indication, n (%)	
Bleeding	106 (72.5)
Prolapse	11 (7.5)
Bleeding and prolapse	29 (19.9)

TABLE 2: EVOLUTION DURING THE FIRST MONTH AFTER THE PROCEDURE.

Postoperative day	1	7	30
Postoperative symptoms. Pain (NRS 1-10)	4	2	0
Bleeding, n (%)	143,1 (98)	73 (50)	4,4 (3)
Tenesmus, n (%)	146 (100)	115.4 (79)	2.9 (2)

band ligation, sclerotherapy injection, infrared coagulation, cryosurgery, laser hemorrhoidectomy, among others. These treatments are usually done on an outpatient basis, without anesthesia. This reduces the costs related to the hospital stay and the use of operating rooms.<sup>14</sup> In our daily practice and in view of the recovery and comfort of the patient, we perform this procedure with sedation and monitoring by an anesthesiologist.

All these procedures are widely performed in patients with early stages of hemorrhoids that do not improve with conservative treatment.<sup>15</sup> For some patients it is very important that with these techniques the recovery time is minimal or almost zero, with no work absenteeism. In our series, the mean pain score described at 24 hours was 4 (on a scale of 1-10, the latter being the maximum), which allowed to resume daily activities the following day.

In describing the original technique, Barron<sup>7</sup> proposes

treating only one hemorrhoid bundle per session; however, many groups report different management. Ramzisham et al.<sup>16</sup> and Cazemier et al.,<sup>17</sup> in their randomized controlled studies report placing between 2 and 6 bands per session. Akihisa et al.,<sup>18</sup> in a series of cases propose up to a maximum of 8 bands per session.

In our series, the maximum number of bands placed per session was 3. In contrast to what the originally described, it seems that more than one band can be placed to reduce the number of sessions needed. However, the maximum number of bands per session allowed has not been reached to a consensus.

Traditionally, rubber band ligation is performed with a rigid proctoscope which compared to the colonoscope is more difficult to maneuver and provides more limited vision. We prefer the colonoscope, since thanks to the antegrade and retroflexed vision provides important information on the clinical presentation and besides allows documenting findings.<sup>19</sup>

In the literature, the rate of complications (mainly pain and bleeding) ranges between 4 to 10%, fatal complications or deaths are rare. In our study, the complication rate was 7.5%. Complications were minor and managed on an outpatient basis. Similar results has one of the lar-

gest series reported so far with the technique (576 patients) by a Taiwan group.<sup>20</sup>

In a prospective randomized study between conventional band ligation and colonoscope ligation by Wehrmann et al.,<sup>19</sup> it was observed that patients in whom the procedure was performed with the aid of the endoscope required fewer sessions (1.8 vs. 2.4;  $p < 0.01$ ) for disease control.

One limitation of our study is that when performing all the band placements with the endoscope, we do not have a comparative series of patients, so the benefits of using the colonoscope are theoretical. In the study mentioned above, the authors observed that both techniques provided the same results in relation to the intention to treat, the control of hemorrhoidal bleeding and the rate of complications, which is expected since they are based on the same mechanism of action.<sup>19</sup>

## CONCLUSIONS

Endoscopic ligation is a reproducible and safe technique that allows the treatment of symptomatic grade I to III hemorrhoids, in the vast majority in one session.

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## COMMENT

The authors present an experience on 145 patients with internal hemorrhoids treated with endoscopic ligation, with excellent short-term results and low morbidity. The treated population is young (average 44 years) with grades I to III hemorrhoids (the details of each subgroup are not mentioned), with a prolapse indication rate of only 27%. It would have

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been interesting to evaluate the results by grade, since they also include grade I, knowing that current recommendations do not usually include conventional ligation in this group.

It should be noted that complications are mild, common to other techniques, and the technique is feasible for outpatient treatment without sequelae.

As a technique per se, it is promising when performed by endoscopic surgeons like the authors but unlike conventional ligation, it requires sedation due to the performance of an associated colonoscopy, which would add theoretically a higher cost, both for the use of the endoscope and the endoscopic bands. As stated by the authors, it would be necessary to carry out new research, both prospective and comparative, to analyze recurrence and other long-term results.

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