



Management of Hemorrhoid Rubber Band Ligation Complications: Massive Rectal Bleeding

Hemoroid Lastik Band Ligasyonu Komplikasyonlarının Yönetimi: Masif Rektal Kanama

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ABSTRACT

Aim: The aim of this study is to present rubber band ligation (RBL), which is one of the non-surgical treatment options in hemorrhoidal disease, its complications and management of massive rectal bleeding, which is an important complication due to its morbidity.

Materials and Methods: Between 2018-2022, five hundred and sixty-four RBL was performed for stage 1-2 and 3 internal hemorrhoidal disease. Seventy two patients with previous anorectal surgery, pregnancy, chronic liver disease were excluded. Four hundred and ninety two patients were included in the study. All patients underwent detailed anorectal examination, in patients over 50 years were evaluated by colonoscopy. The demographic characteristics of the patients, the number of applied band ligation and complications (minor-major) were evaluated.

Results: The mean age of the patients was 33.4 ± 11 (18-65) years, 385 were male (78.3%) and 107 were female (21.7%). Thirty-nine patients (8%) had single band ligation, 448 (91%) patients had double band ligation and 5 patients had triple band ligation. After RBL minor complications (anal pain, vasovagal symptoms, minor rectal bleeding, urinary retention) developed in twenty patients (4%) and massive rectal bleeding developed in 4 (0.8%) patients as a major complication.

Conclusion: Hemorrhoidal banding is a safe and effective method for treatment of hemorrhoidal disease. This study highlights a rare, life-threatening complication of RBL.

Keywords: Hemorrhoids, hemorrhage, ligation

ÖZ

Amaç: Çalışmanın amacı, hemoroidal hastalıkta cerrahi dışı tedavi seçeneklerinden biri olan lastik band ligasyonunu (RBL) ve buna bağlı gelişen komplikasyonları incelemektir. Morbiditesi nedeniyle önem arz eden masif rektal kanama komplikasyonunun yönetimini sunmaktır.

Gereç ve Yöntem: Evre 1-2 ve 3 internal hemoroidal hastalık nedeniyle 2018-2022 yılları arasında kliniğimizde RBL yapılan 564 hasta retrospektif olarak irdelenmiştir. Gebelik durumu, geçirilmiş anorektal cerrahi, kronik karaciğer hastalığı ve antikoagülan kullanımı nedeniyle 72 hasta çalışma dışında bırakılmıştır. Hastaların 492'si çalışmaya dahil edilmiştir. Tüm hastalara proktoloji ünitesinde detaylı anorektal muayene, 50 yaş üstündekilere ise kolonoskopik değerlendirme yapılmıştır. Hastaların demografik özellikleri, gelişen komplikasyonlar (minör/majör) ve uygulanan band ligasyon sayısı standardize edilmiş formlara kayıt edildi.

Bulgular: Hastaların ortalama yaşı $33,4 \pm 11$ (18-65) yıl olup, 385'i (%78,3) erkek, 107'si (%21,7) kadındı. Hastaların 39'una (%8) tek kadran, 448 hastaya (%91) iki kadran ve 5 hastaya üç kadran RBL uygulandı. RBL sonrası minör komplikasyonlar (anal ağrı, vazovagal semptomlar, minör rektal kanama, üriner retansiyon) yirmi hastada (%4) gelişirken, hastaların 4'ünde (%0,8) masif rektal kanama meydana gelmiştir. Masif rektal kanama gelişen hastaların hepsi acil şartlarda hospitalize edildi ve operasyona alındı. Bu hastaların birine 3 ünite, üç hastaya ise 4 ünite eritrosit transfüzyonu yapıldı.

Sonuç: Hemoroidal band ligasyonu, hemoroidal hastalık tedavisinde güvenli ve etkili bir yöntemdir. Ancak hayatı tehdit edecek ciddi kanamalara yol açabileceği göz önünde bulundurulmalıdır.

Anahtar Kelimeler: Hemoroid, kanama, ligasyon

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INTRODUCTION

Hemorrhoidal disease is a very common anorectal disease encountered in colorectal clinics¹. Blood entering the hemorrhoidal pads via the hemorrhoidal arteries at rest easily returns to the venous system from the anal canal. As a result of the slowing of venous return due to forced and prolonged straining during defecation and the adverse effect on lymphatic circulation, anal edema may develop following defecation. In addition to these vascular changes, hemorrhoidal disease is also caused by degeneration of muscle and connective tissue. The sliding anal cushion theory developed by Thomson²⁻⁴ is currently the most widely accepted theory of hemorrhoidal disease formation.

Non-surgical day-to-day procedures, surgical methods and advanced technological instruments are used in the treatment of hemorrhoidal disease. Popular interventions include sclerotherapy, infrared coagulation, radiofrequency ablation (RF), rubber band ligation (RBL), laser ablation, Milligan Morgan hemorrhoidectomy (open), Ferguson hemorrhoidectomy (closed), LigaSure (LigaSure™, Valleylab, Covidien) hemorrhoidectomy, ultrasonic scalpel (US hemorrhoidectomy), stapled hemorrhoidectomy (PPH), and Doppler guided hemorrhoidal artery ligation.

The application of RBL in hemorrhoidal disease was described by Blaisdell⁵ in the 1950s and has survived to the present day after being modified by Barron⁶. Since then, this technique, with hemorrhoidal band ligation, has gained importance as an effective and cost-effective method in the treatment of internal hemorrhoidal disease by causing fixation, retraction and fibrosis of hemorrhoidal pads⁷. Recently, extensive clinical studies and data emphasize that RBL is an effective outpatient alternative to surgery in the treatment of stage 2 and 3 internal hemorrhoidal disease with minimal complication rate, no need for general anesthesia and no need for hospitalization⁸⁻¹⁰.

In this study, we discuss the approach and treatment methods for a rare complication of massive rectal bleeding, related to RBL, which is an effective and safe method.

MATERIALS AND METHODS

Five hundred-sixty four patients who were admitted to our clinic as outpatients between 2018 and 2022 and underwent RBL for stage 1-2 and 3 internal hemorrhoidal disease were retrospectively analyzed. Four hundred ninety-two patients were included in the study. Seventy-two patients were excluded from the study because of anticoagulant use outside the physician's control after the procedure, history of previous anorectal surgery, pregnancy status, and chronic liver disease. Ethics committee approval with number 17 was obtained from Atılım University Faculty of Medicine, Medicana International Ankara Hospital on 14.07.2023 for this study.

All patients underwent a detailed anorectal examination in the proctology unit, and colonoscopy was performed in addition to the examination in patients over 50 years of age. All band ligations were performed in the endoscopy unit preferably under intravenous sedation in the left lateral position. One-, two-, and three-quadrant RBL was performed according to the current hemorrhoidal disease status of the patients (Table 1). The procedure was performed with a disposable anoscope and Mc Gown band ligator (Figure 1). RBL was applied to diseased hemorrhoidal veins approximately 1 cm proximal to the dentate line. All band ligations were performed at the root of the aspirated hemorrhoidal vein after aspiration with the vacuum chamber pressure of the band ligator between 400-600 mmHg. Patients were discharged as outpatients after recovery in the recovery room. Demographic characteristics of the patients, complications (minor/major) and the number of band ligations performed were recorded on standardized forms.

All patients who developed massive rectal bleeding underwent urgent anal exploration after stabilization of vital signs and fluid replacement, and the abundant blood accumulated in

Table 1. Demographic characteristics of the patients and the number of bands applied to the patients

Demographic characteristics	n (%)
Age	33.4±11
Gender	
Female	107 (21.7)
Male	385 (78.3)
Number of bands	
Single quadrant	39 (8)
Two quadrants	448 (91)
Three quadrants	5 (1)



Figure 1. Anoscope, Mc Gown ligator, rubber bands

the rectum was aspirated. On anal exploration, foci of mucosal necrosis and active arterial bleeding were observed in the band ligation quadrant. Primary hemostasis of this area was performed with 3/0 vicryl suture. After stopping the bleeding focus, it was checked whether there was any other bleeding area. Patients who were hemodynamically stable and had defecation without rectal bleeding on post-operative day 2 were discharged.

Statistical Analysis

All data were computerized and Statistical Package for the Social Sciences (SPSS) 20.0 software (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Data were expressed

as median (range) and categorical data were expressed as percentages.

RESULTS

The mean age of the patients was 33.4 ± 11 (18-65) years, 385 were male (78.3%) and 107 were female (21.7%). Single quadrant RBL was performed in 39 (8%), two quadrants in 448 (91%) and three (3) quadrants in 5 patients (Table 1 and Figures 2, 3, 4). Twenty patients (4%) developed minor complications (anal pain, vasovagal symptoms, minor rectal bleeding, urinary retention) after RBL, while massive rectal bleeding occurred in 4 patients (0.8%) (Table 2).

Minor complications included anal pain in 1 patient, vasovagal symptoms secondary to possible anal pain in 1 patient, urinary retention in 1 patient, and minor rectal bleeding occurring between days 7 and 10 of the procedure in 17 patients. While anal pain in one patient resolved with the use of non-steroidal anti-inflammatory drugs, the other patient was re-examined on the same day due to severe anal pain and it was observed

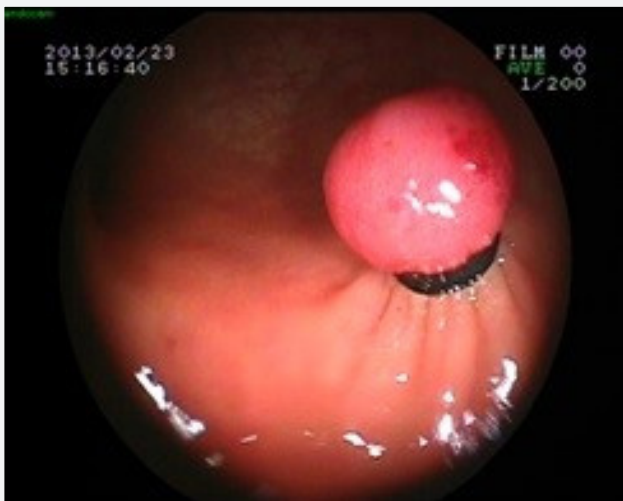


Figure 2. Endoscopic view of single (1) quadrant rubber band ligation



Figure 3. Endoscopic view of two (2) quadrant rubber band ligation



Figure 4. Endoscopic view of three (3) quadrant rubber band ligation

Table 2. Complications developing due to rubber band ligation application to patients

Complications	n (%)
Major complications	
Massive lower gastrointestinal bleeding	4 (0.8%)
Pelvic sepsis	0
Minor complications	20 (4%)
Anal pain	1
Minor rectal bleeding	17
Vasovagal symptoms	1
Urinary retention	1

that the band was very close to the dentate line. In the same session, the band was removed and band ligation was performed again more proximal to the dentate line.

All patients with massive rectal bleeding required hospitalization and operation, one patient received 3 units of erythrocyte transfusion and three patients received 4 units. All patients with massive rectal bleeding, which was a major complication, were male. Massive bleeding developed between 10-14 days in the late postoperative period. Patients with massive rectal bleeding presented to the emergency department with a dramatic rectal bleeding picture. They had clinical picture of hypovolemia. Patients were admitted to the clinic, their vital signs were stabilized and they were operated under emergency conditions. Two patients underwent anal exploration under general anesthesia and 2 patients under spinal anesthesia in jack-knife position.

DISCUSSION

Many surgical and non-surgical methods such as laser ablation, RBL, infrared coagulation, and sclerotherapy have been described in the treatment of hemorrhoidal disease. RBL is a widely used treatment method for hemorrhoidal disease with a lower complication rate compared to conventional surgery⁹⁻¹¹. Although band ligation is considered as a non-surgical intervention, some complications after the procedure have been described. These complications include pain, rectal bleeding, vasovagal symptoms, anal fissure, thrombosis of the external piles, urinary retention (glob vesica) and infection (pelvic sepsis, Fournier's gangrene, etc.)¹².

In a study by Iyer et al.¹³, the complication rates of 2114 rubber band applications for hemorrhoidal disease were as follows: pain 8.7%, bleeding 2.8%, external vein thrombosis 1.5%, pelvic sepsis 0.09%. Bat et al.¹⁴ found a major complication rate of 2.5% requiring hospitalization in their study. El Nakeeb et al.¹⁵ compared patients operated for grade 2 and 3 hemorrhoidal disease who underwent 2122 RBL procedures and found no statistically significant difference in the treatment of the disease. The complication rates after RBL were 4.1% pain, 4.1% minor bleeding, 1.3% vasovagal symptoms, 0.13% infection, 0.13% perianal fistula, and 0.4% perianal fissure. They observed that rectal bleeding developed between days 7-14 of the procedure. Similarly, in our study, the rate of minor complications was 4%, while the rate of major complications requiring hospitalization was 0.8%.

Bleeding is an important complication of RBL. Although most bleeding is self-limiting and does not require hospitalization or transfusion, massive lower gastrointestinal bleeding is rare and can be life-threatening. Bleeding rates have been reported to be 2-4% in various publications¹³⁻¹⁵. In our study, the rate of

minor rectal bleeding that was self-limiting and did not require hospitalization was found to be 3.5%. Bleeding was observed in the late post-procedural period, usually on the 10th-14th day, suggesting that it was due to necrosis caused by the band¹². Clopidogrel, aspirin and non-steroidal anti-inflammatory drugs have been shown in the literature to increase the risk of massive rectal bleeding after RBL^{16,17}.

Massive lower gastrointestinal bleeding has been reported in the literature in large series as well as case reports^{12,15-18}. Although most of the massive lower gastrointestinal bleeding reported in these studies was emphasized to be related to the use of aspirin, non-steroidal anti-inflammatory drugs and anticoagulants, there was no drug use in our series. Similarly, bleeding after RBL was observed between 7-14 days and massive rectal bleeding was observed after the 10th day in all patients.

Study Limitations

In our study, complications after RBL in hemorrhoidal disease and the management of these complications were examined. No comparison was made with other methods used in the treatment of hemorrhoidal disease.

CONCLUSION

Although hemorrhoid RBL is considered an economical, effective and safe method, it should be kept in mind that it has life-threatening complications. Patients should be advised that bleeding may occur within 7-14 days after the procedure and patients should be advised to come for follow-up especially during this period. During the band ligation procedure, excessive suction should be avoided and the negative pressure should be 400-600 mmHg. Patients should be carefully questioned about any bleeding disorders, aspirin, non-steroidal anti-inflammatory drugs and anticoagulant use before the band ligation procedure. Although it was not observed in our series, it is important to follow the patient in terms of perianal infection/pelvic sepsis, which is another major complication other than bleeding reported in the literature.

Ethics

Ethics Committee Approval: Ethics committee approval with number 17 was obtained from Atılım University Faculty of Medicine, Medicana International Ankara Hospital on 14.07.2023 for this study.

Informed Consent: It is a retrospective study.

Author Contributions

Surgical and Medical Practice: B.E., M.G. Design: B.E., A.C.E., Data Collection or Processing: M.G., Interpretation: B.E., M.G.,

Literature Search: A.C.E., M.G., Writing: M.G., A.C.E.

Conflict of Interest: The authors declare no conflict of interest in relation to this article.

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