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Massive gastrointestinal bleeding after endoscopic rubber band ligation of internal hemorrhoids: A case report

case report and review of the literature

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Abstract

BACKGROUND

Rubber band ligation (RBL) using rigid anoscope is a commonly recommended therapy for grade I-III symptomatic internal hemorrhoids. Severe complications of RBL include pain, hemorrhage, sepsis and hepatic failure. Flexible endoscopic rubber band ligation (ERBL) is now more commonly used in rubber band ligation therapy, but few severe complications have been reported. Here we report a case of massive bleeding after endoscopic rubber band ligation.

CASE SUMMARY

A 31-year old female admitted to the department of gastroenterology with a chief complaint of discontinuous hematochezia for 2 years. No previous history, accompanying diseases or drug use was reported. Physical examination and colonoscopy showed grade II internal hemorrhoids. The patient received endoscopic rubber band ligation therapy. Five days after ligation, the patient presented mild hematochezia. On day 7 and 9 after ligation, she presented with large rectal bleeding, dizziness and weakness. Emergency colonoscopy revealed active bleeding and ulcer in anal wound. Hemoclips were placed to stop the bleeding. No further bleeding was reported up to Day 15, and she was discharged home with unsatisfactory recovery.

CONCLUSION

Endoscopic rubber band ligation therapy is an effective treatment for symptomatic internal hemorrhoids with satisfactory short and long-term recovery. Pain and anal bleeding were the most frequently reported postoperative complications. Coagulation disorders demonstrated the increase risk of bleeding. Although rarely reported, our case reminds us that those patients without coagulation disorders are also at risk of massive life-threatening bleeding and needs strict follow-up after ligation.

Key Words: Internal hemorrhoids, Endoscopy, Rubber band ligation, Complication, Bleeding; Case report

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Core Tip: Endoscopic rubber band ligation (ERBL) is an effective treatment for symptomatic internal hemorrhoids, but few severe complications have been found. A 31-year old female with grade II internal hemorrhoids received ERBL therapy. No previous history or coagulation disorder was reported. Meanwhile she presented with delayed massive rectal bleeding after the ligation. Colonoscopy showed active bleeding and ulcer in anal wound. Coagulation disorders were previously reported in relation to bleeding after ligation. However, this case reminds us that patients without coagulation disorders are also at risk of massive life-threatening bleeding after ERBL.

INTRODUCTION

Internal hemorrhoid is a common lower gastrointestinal disease, and is a main cause of lower gastrointestinal bleeding [1, 2]. Rubber band ligation (RBL) is a commonly recommended therapy for grade I-III symptomatic internal hemorrhoids [1, 3-5]. However, several life-threatening complications have been reported, including massive hemorrhage, sepsis and hepatic failure[6, 7]. Due to the development of flexible endoscopy, it has been more widely used for the treatment of internal hemorrhoids. Flexible endoscopy is feasible for ligation in both forward-view and retroflexion. The advantage of the retroflexion procedure is its easy operation in anal zone, though it may induce more pain [8]. Several complications (pain, anal discomfort, lower gastrointestinal bleeding, and early detachment) have been reported in endoscopic rubber band ligation (ERBL) [8, 9]. However, few severe complications have been reported.

Here we report a case of internal hemorrhoid therapy, which caused rare massive hemorrhage after endoscopic rubber band ligation. Furthermore, we reviewed the latest article involving the effects and complications of ERBL, hoping to provide clinical reference for this therapy.

CASE PRESENTATION

Chief complaints

A 31-year old Asian female presented with a chief complaint of discontinuous hematochezia for 2 years at the Department of Gastroenterology.

History of present illness

The patient generally had lower gastrointestinal bleeding occurring at the end of defecation 3-4 times/week, with several drops of bright red blood in the past 2 years. She frequently experienced prolapsed hemorrhoids that automatically retracted after defecation. Her stool habit was normal, with frequency of 1-2 times/day. The patient adjusted her lifestyle by reducing sedentary behaviors and stress, and maintaining regular stool habit. However, those measures failed to improve her symptoms. Warm water baths and ointments could shortly reduce bleeding, but the patient was dissatisfied and required more aggressive treatment, including endoscopic therapy.

History of past illness

No other previous history or accompanied diseases was reported. The patient denied any use of anticoagulant or antiplatelet drugs.

Personal and family history

The patient denied any history of smoking, alcohol use, food or drug allergies. She had no family history of gastrointestinal tumors or genetic diseases.

1

Physical examination

The patient's temperature was 36.2 °C, heart rate was 80 bpm, breath rate was 18 bpm, and blood pressure was 126/82 mmHg. Examination of the chest, lungs and abdomen showed no abnormalities. Examination of the anus showed prolapsed hemorrhoids during defecate movements (Figure 1A), and it automatically retracted after defecation. Digital rectal examination revealed enlarged hemorrhoids, and no bloodstain was left on gloves.

Laboratory examinations

Regular preoperative examination, including blood routine, liver and kidney function tests, coagulation function and electrocardiography, was performed before ERBL. Hemoglobin (Hb) =112g/L, and no other abnormal results were reported.

Imaging examinations

None

Endoscopy

Flexible colonoscopy was performed under intraprocedural analgesia by diprivan, which revealed normal colorectal mucosa, and internal hemorrhoids with positive red color sign (Figure 1B).

FINAL DIAGNOSIS

The patient was diagnosed with grade II internal hemorrhoids and mild anemia.

TREATMENT

For the convenience of the patient, we performed ERBL with endoscopic examination continuously. In order to manage better postoperative care, the patient underwent hospital admission. Following the colonoscopy examination, the patient was treated with endoscopic rubber band ligation therapy using Multiple Band Ligator (Boston Scientific, Speedband Superview Super 7 TM, 7 Bands). Five rubber bands were

performed on hemorrhoids (Figure 1C). She received diprivan (Propofol Injection, 20 mL, 200mg) for anesthesia during the endoscopic examination and ERBL therapy to avoid intraoperative pain. After ligation, the prolapsed hemorrhoid tissue was withdrawn into the anus (Figure 1D). After ERBL, the patient is requested to take light diet to avoid bleeding, and oral laxatives (10 mL, tid) was given to soften the stool.

OUTCOME AND FOLLOW-UP

Approximately 4 h after ligation, the patient felt mild anal pain, sometimes associated with nausea. An intramuscular injection of 10 mg of tramadol rapidly remitted the pain. 24 Hours after ligation, the patient was permitted to eat light food. Lactulose (10 mL, tid, po) was given to soften the stool and to prevent post-ERBL bleeding. 5 days after ligation, the patient did not report rectal bleeding during defecation, and prolapse significantly improved. Therefore, she was discharged home following the doctors' advice.

On Day 7 after ligation, she was sent to the emergency department with significant painless fresh rectal bleeding of approximately 400 mL, accompanied by systemic symptoms of dizziness and weakness. Emergency colonoscopy showed active oozing of blood in anal wound (Figure 2A). Two hemoclips (ROCC-D-26-195-C, Micro-Tech(Nanjing) Co., Ltd, Maximum Span width =10mm) were placed to stop the bleeding. Then the patient was sent to the ward safely with the hemoglobin level of 93 g/L (Figure 3). However, early on Day 9, she suddenly presented with large amounts of rectal bleeding of over 800 mL, and she fainted during defecation. Blood pressure was 95/50 mmHg and pulse was 116 beats/min. Resuscitation with oxygen and intravenous fluids with electrolyte solution was initiated. She was immediately sent to the endoscopic department under electrocardiographic monitoring. Emergency colonoscopy showed that all rubber bands had slipped off, leaving multiple bleeding ulcers in the anal wound (Figure 2B). Ischemic necrotic tissue containing 1 hemoclip was removed by forcep (FG-32L-1, Olympus Corporation), and 3 more hemoclips were placed and successfully stopped the bleeding (Figure 2C). The patient received fluid

infusion and symptomatic treatment, and omidazole (200 mg qd iv) was used to prevent infection. Although blood routine revealed a hemoglobin of merely 67 g/L (Figure 3), the patient refused blood transfusion. No further bleeding was reported until 15 days after ligation. Re-examination by colonoscopy on Day 12 and 15 showed a gradually healed wound, covered by ischemic scabs (Figure 2D+E). The patient was discharged home with moderate anemia, and hemoglobin was 74 g/L (Figure 3). Although hemorrhoids prolapse disappeared after ERBL, she was dissatisfied with the subsequent complications. The duration of the hospitalization is 17 days, and the cost of the procedure is 1500 \$, including endoscopy+ ligation therapy (800 \$), drugs(200 \$) and hospitalization (500 \$).

1 mo after ligation, we investigated the patient through telephone. No bleeding or hemorrhoids prolapse was reported. 3 mo after ligation, the patient received re-examination, her hemoglobin reached 132 g/L. Colonoscopy revealed that the anal wound has healed, no hemorrhoids was found (Figure 2F).

DISCUSSION

Rubber band ligation of internal hemorrhoids grasps the hemorrhoidal tissue with an elastic rubber band, and such ligation causes ischemic necrosis and cicatricial fixation of the hemorrhoidal tissue. Compared with surgical methods such as excisional hemorrhoidectomy, stapled hemorrhoidectomy and hemorrhoidal artery ligation, RBL with anoscopy causes fewer postoperative complications as well as a shorter hospitalization period [10-13], and it has been proven to be a safer and more cost-effective treatment for grade I-III internal hemorrhoids [14]. Compared with other nonsurgical methods (sclerotherapy, infrared coagulation), RBL shows higher efficacy and a lower recurrence rate, and it is more effective for prolapsed hemorrhoids [15]. Endoscopic rubber band ligation (ERBL), first introduced by Trowers *et al* [16], has been more commonly used in the treatment of grade I-III internal hemorrhoids. The therapeutic effects of ERBL have been verified by recent studies. In an observational study including 82 patients with grade I-IV internal hemorrhoids, Akihisa Fukuda *et al*

reported a significant reduction in symptom scores within 4 wk after ERBL in the retroflexed position [19]. Ming-Yao Su *et al* enrolled 576 patients with grade II-IV internal hemorrhoids in a 1-year follow-up study, which showed that 93.58% of patients experienced at least one grade reduction in the severity of hemorrhoids after ERBL [18]. Another follow-up study including 759 patients reported 87.0% controlled bleeding and 83.1% controlled prolapse rates within 5 years [19]. These results indicated that ERBL is a simple and well-tolerated treatment for symptomatic internal hemorrhoids with satisfactory short and long-term recovery [18, 19]. New devices for ERBL have been developed in recent years, and more flexible gastroscope and transparent cap are increasingly used to assist ERBL operation [20, 21]. [Dimitrios Paikos](#) *et al* reported that the O'Regan disposable bander device showed good response and low complication rate in outpatients with symptomatic hemorrhoids [22]. Ming-Yao Su *et al* demonstrated that both small (9mm) and large (13mm) diameter device showed equivalent effects on 218 cases of grade II-IV internal hemorrhoids [23]. Furthermore, ERBL has been proven to be safe for certain patients including those with liver cirrhosis and portal hypertension [24, 25].

Although the therapeutic advantages of ERBL on traditional RBL with anoscopy have not been evidently revealed, ERBL is increasingly preferred by operators. Endoscopy is strongly recommended to exclude other severe diseases including colorectal ulcers and cancer, which share similar bleeding symptoms [26, 27]. Simultaneous endoscopic examination with hemorrhoid treatments provide convenience for these patients. Flexible endoscopy is feasible for ligation in both forward-view and retroflexion. The advantage of the retroflexion procedure is its easy operation and controllability. Akihisa *et al* demonstrated that using an endoscope in both the forward and retroflexed positions, internal hemorrhoids were more easily evaluated by range, form and red color signs, which are closely related to hemorrhoid symptoms [28]. More importantly, retroflexion in the anal zone provides a better view, which can help to ligate above the dentate line to avoid post-RBL pain [9]. In two randomized trials performed by Wehrmann T. *et al* and Cazemier, M *et al*, ERBL

showed similar efficacy and safety compared with traditional RBL using anoscopy, and the recurrence rate of bleeding symptoms using the two methods was also comparable. However, these studies reported that ERBL is significantly easier to perform, and requires fewer treatment sessions [8, 9].

Currently limited research has analyzed the complications of ERBL. Pain and anal bleeding were the most frequently reported postoperative complications. In a long-term follow-up study enrolling 759 patients, Ming-Yao Su *et al* reported that 12.3% of patients experienced mild anal pain 1-3 days after treatment, which was relieved by oral analgesia. Overall, 6.3% of patients had mild bleeding (some blood noted in tissue papers) 1-14 days after treatment, and were cured by epinephrine injection [19]. Schleinstein H. P. *et al* reported 55.2% pain and 29.3% mild bleeding at 2 h post-ERBL, and the rate declined to 25.9% pain and 10.3% bleeding at 10-14 days with observation or symptomatic treatment [21]. When compared with other treatments, Cazemier, M *et al* reported increased postoperative pain in ERBL than traditional RBL using anoscopy [9], however, such findings remain controversial [8]. Therefore, ERBL is generally considered a cost-effective treatment, in which most complications are mild and self-confined. Severe complications are rarely reported in single cases. Eugene A. Trowers first reported 1 case of single severe perianal pain and 1 case of thrombosed external hemorrhoids in a cohort study of 20 cases [16]. Rome Jutabha *et al* reported 2 cases of severe pain among patients who took narcotic agents, but no hospitalization was needed [29]. Ming-Yao Su *et al* reported a 3 mo of pain that required analgesia [23], and a death due to hepatic failure [19].

In previous RBL using anoscopy, bleeding after RBL usually occurs 10-14 days after RBL when rubber bands slough [30]. Coagulation disorders were demonstrated to increase the risk of bleeding related to RBL. Iyer VS *et al* reported a retrospective study including 805 patients, showing that patients taking acetylsalicylic acid (ASA) /nonsteroidal anti-inflammatory drugs (NSAIDs) /warfarin had higher rates of post-RBL bleeding [31]. Massive life-threatening post-RBL bleeding was rare but well documented (*summarized in Table1*). In a prospective study enrolling 512 patients, Bat. L

et al reported 6 cases of massive post-RBL bleeding, of which 5 patients had a recent history of ASA use [30]. Moreover, several case reports of life-threatening post-RBL bleeding had a history of ASA and clopidogrel [7, 32, 33]. Few cases of life-threatening post-ERBL bleeding have been reported, and are also associated with coagulation disorders. Roy Soetikno *et al* reported 3 cases of severe bleeding after hemorrhoid ligation with a history of ASA/warfarin use. One of these patients accepted ERBL, resulting in active bleeding vessel within the ulcer in the anal region [34]. Therefore, it is recommended that patients should stop anticoagulant/antiplatelet drugs in the perioperative period to prevent post-ERBL bleeding [7]. In contrast to previous reports, the patient in our case denied any use of anticoagulant/antiplatelet drugs, and the coagulation function examination was normal before ERBL. Furthermore, the patient underwent hospitalized observation and cautious postoperative care. She took light diet and laxatives to soften the stool. However, all of those measures failed to prevent massive post-ERBL bleeding. No risk factors seemed to have been the clear cause of in her massive bleeding.

CONCLUSION

In conclusion, endoscopic rubber band ligation is a safe and effective therapy for internal hemorrhoids with rare severe complications. However, our case reminds us that those patients are also at risk of life-threatening bleeding and need strict follow-up after ligation, even if no coagulation disorder is present.

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