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Gastric ulcer treated using an elastic traction ring combined with clip: A case report and literature review

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Abstract

BACKGROUND

There is a high annual incidence of acute, nonvariceal upper gastrointestinal bleeding in Chinese adults. Early endoscopic intervention can reduce rates of rebleeding, surgery, and mortality. The metal clip is the most common method for establishing homeostasis; however, it possesses several limitations. In patients with bleeding secondary to large gastric ulcers, the clip will often fail to stop the bleeding. This article highlights the use of an elastic traction ring as a novel hemostatic method for patients with upper gastrointestinal bleeding.

CASE SUMMARY

An elderly male presented to the emergency room with complaints of hematemesis and melena. Endoscopic examination revealed an ulcer (Forrest IIa) in the lesser curvature of the gastric antrum. Six tissue clips and one elastic traction ring were inserted into the stomach cavity to suture the ulcer. The patient recovered quickly without postoperative gastrointestinal bleeding. Two months later, the patient's ulcer was significantly healed.

CONCLUSION

To our best knowledge, this is the first report to demonstrate the safety and efficacy of elastic traction rings for upper gastrointestinal bleeding. Elastic traction rings should be considered a routine therapeutic modality for patients with upper gastrointestinal bleeds.

INTRODUCTION

The annual incidence of acute upper gastrointestinal bleeding in Chinese adults is high; 80%–90% are acute nonvariceal upper gastrointestinal bleeding. Early endoscopic intervention can reduce rates of rebleeding, surgery, and mortality. Various methods of establishing hemostasis using endoscopic submucosal dissection (ESD) exist. The metal clip is the most common method for establishing homeostasis; however, it possesses several limitations for larger gastric ulcers.

We invented an elastic traction ring and used it during ESD surgery to assist with wound resection and suturing.

CASE PRESENTATION

Chief complaints

A 66-year-old Chinese male presented to the emergency department with hematemesis and melena.

History of present illness

The patient's symptoms started 1 day before presentation.

History of past illness

His past medical history was significant for gout with intermittent gouty arthritis (>10 years, treated with oral nonsteroidal anti-inflammatory drugs) and poorly-controlled hypertension (>5 years, treated with oral aspirin and Apocynum).

Personal and family history

The patient denied any family history of malignant tumors.

Physical examination

A physical examination revealed: a body temperature of 36.8°C; blood pressure of 118/48 mmHg; heart rate of 76 beats per min; and respiratory rate of 19 breaths per min. His skin, mucus membranes, and lips were pale. His abdomen was soft and without tenderness. He

exhibited normal rebound in response to pain and bowel sounds. There were no abnormal masses noted.

Laboratory examinations

All serum tumor marker levels were normal. His hemoglobin (Hgb) was 67 g/L, and blood urea nitrogen (BUN) was 14.27 mmol/L. All other laboratory results were unremarkable.

Imaging examinations

The patient's abdominal computed tomography scan was normal

FURTHER DIAGNOSTIC WORKUP

The patient was diagnosed with an upper gastrointestinal bleed. To determine the location and cause of the bleeding, the patient underwent gastroscopy after providing written informed consent. Endoscopy revealed one 1.5 × 2.0cm ulcer (Forrest IIa) in the lesser curvature of the gastric antrum with a bare leak of blood vessels noted in the base. Using only a tissue clip, we were unable to completely occlude the ulcer. To achieve hemostasis, we adopted a novel approach, as follows.

We inserted a tissue clip with an elastic traction ring through the gastroscopic biopsy channel and into the stomach cavity where it was fixed to the normal mucosa surrounding the ulcer. We used a second tissue clip to secure the large circle of the elastic traction ring and provide sufficient tension. The ring was then fixed to the normal mucosa on the other side of the ulcer. The elastic traction ring's tensile forces successfully narrowed the ulcer's surface. The tissue clips were used again to suture the ulcer completely (Figure 1). This treatment was well tolerated and the patient did not experience any postoperative discomfort.

FINAL DIAGNOSIS

Considering the patient's medical history, he was finally diagnosed with an upper gastrointestinal ulcer with bleeding.

TREATMENT, OUTCOME, AND FOLLOW-UP

The patient was able to tolerate a thin liquid diet 1 day after surgery and was discharged 3 days after surgery. He experienced no postoperative bleeding and his Hgb increased to 88g/L and his BUN normalized. His second postoperative defecation after endoscopy was yellow and soft. After 6 weeks of regular medication, he underwent a repeat gastroscopy which revealed a healed ulcer (Figure 2).

DISCUSSION

The current annual incidence of acute upper gastrointestinal bleeding in Chinese adults is 100–180/100,000^[1]; of these, 80%–90% are acute nonvariceal upper gastrointestinal bleeds^[2]. The Forrest classification includes four severity levels (Ia, Ib, IIa, and IIc) that correspond to rebleeding rates of 90%, 50%, 25%–30%, and 10%–20%, respectively^[3]. Patients at risk for bleeding ulcers require timely endoscopic intervention^[4]. Early endoscopy can reduce rates of rebleeding, surgery, and mortality^[1,5,6]. After ESD, rebleeding was observed to decrease from 18.4% to 10.6%, emergency surgery decreased from 11.3% to 7.6%, and mortality decreased from 5.1% to 2.6%^[7]. At present, endoscopic hemostatic measures mainly include topical drug application, local drug injection, laser, microwave, argon plasma coagulation (APC), thermal hemostatic clamping, hemostatic clamping, nylon rope combined with hemostatic clamping, and the over the scope clip hemostatic clip^[8]. The metal clip is the most common method for establishing homeostasis; however, it possesses several limitations. Meanwhile, other methods are expensive or complicated. While metal clips are good for addressing routine bleeding ulcers, they can be ineffective for large, deep, or unusually situated lesions.

ESD surgery uses traction technology to maximize the operator's surgical field of view while enhancing safety and clinical efficacy^[9]. Various kinds of traction aids exist; however, the novel elastic traction ring is becoming more popular^[10,11]. Because these rings are new, their application and function require additional study. Therefore, there is currently a lack of relevant data on its use and efficacy.

We have used the elastic traction ring for gastroscopic suturing of upper gastrointestinal ulcers. To our best knowledge, this is the first report of successful hemostasis using an elastic traction ring to rapidly shrink the ulcer surface during a very simple operation. The ulcer can then be occluded using a metal clip. This allows for

complete occlusion during a single endoscopy. Moreover, the postclipping rebleeding rate is lower than rates of rebleeding following topical treatments, APC, and heated hemostatic forceps.

Our traction ring features a double ring and is ~1 cm relaxed and ~1.5 cm when in a tensile state. As described here, we easily use the elastic traction ring to suture a 2-cm diameter gastric ulcer. We are continuing to try and determine the maximum ulcer diameter where our ring could be successfully deployed.

CONCLUSION

In conclusion, this is the first report of a new technique for establishing homeostasis under endoscopy. Importantly, our novel elastic traction ring appears both safe and effective for use with upper gastrointestinal ulcers. We recommend that surgeons consider the elastic traction ring as a potential therapeutic modality for use with patients who present with bleeding upper gastrointestinal ulcers. Our method can also be used for suturing after ESD. We believe that our method d further study and discussion.

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SIMILARITY INDEX

PRIMARY SOURCES

1	Lu Huang, Yongping Wu, Xudong Miao. "Localized Histoplasma capsulatum osteomyelitis of the fibula in an immunocompetent teenage boy: a case report", BMC Infectious Diseases, 2013	24 words — 2%
2	Chan, Francis K.L., and James Y.W. Lau. "Treatment of Peptic Ulcer Disease", Sleisenger and Fordtran's Gastrointestinal and Liver Disease, 2010.	22 words — 2%
3	f6publishing.blob.core.windows.net	14 words — 1%