New Methods -New Materials

Endoscopic closure of a perforation using metallic clips after snare excision of a gastric leiomyoma

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Traditionally, gastrointestinal perforation secondary to endoscopic procedures are treated by prompt surgery. Endoscopic management has not been previously reported. We recently used a commercially available metallic clip to close a perforation after snare cautery excision of a symptomatic gastric leiomyoma

CASE REPORT AND METHOD

A 63-year-old man presented with melena and iron-deficiency anemia. He had a 3-year history of ulcerative colitis involving the rectum and sigmoid colon, for which he was on maintenance Azulfidine therapy. Rectosigmoidoscopy was performed and revealed inactive inflammatory bowel disease. On UGI endoscopy he was found to have a firm rounded, protruding submucosal tumor, measuring 4 cm, the fundus (Fig. lA). The tumor had a thick, short stalk and was mobile. No evidence for active gastrointestinal bleeding was observed. Endosonography was performed and revealed a well-circumscribed 3.7 x 3.4 cm submucosal tumor originating from the muscle layer compatible with leiomyoma (Fig. 2). No vascular structures were seen within or in the vicinity of the tumor. No enlarged or pathologic lymph nodes were noted. The tumor was diagnosed as a leiomyoma.

Informed consent was obtained for endoscopic removal of the submucosal tumor. Epinephrine (1:20,000, approximately 2 cc) was injected at the base area of attachment as a prophylactic measure to reduce the risk of bleeding. A standard polypectomy snare was used to excise the tumor. After the snare was applied to the base of the tumor, the tumor was transected by applying several seconds of blended current while gradually tightening the snare. The stalk was kept under constant tension by lifting the tumor away from

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GASTROINTESTINAL ENDOSCOPY

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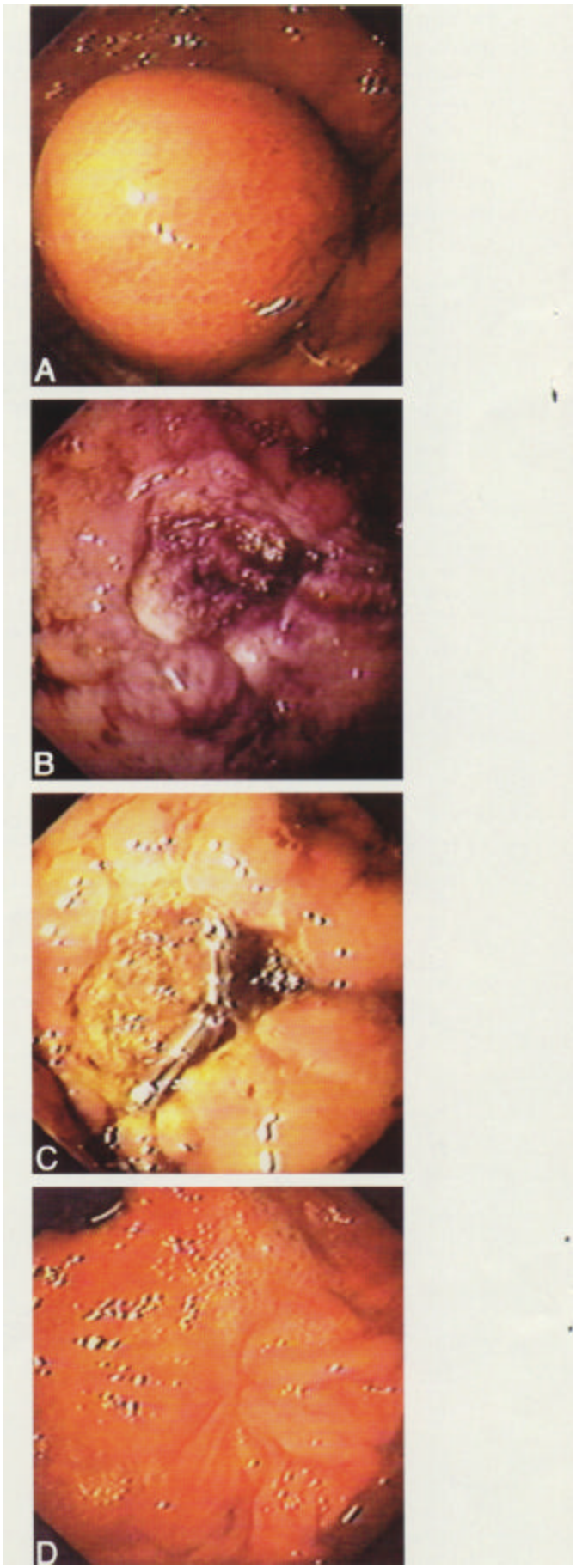

Figure 1. Endoscopic views. **A,** 4-cm submucosal tumor in the gastric fundus; **B,** 2-cm mucosal defect containing a 0.5-cm perforation after snare excision; **C,** closure of the perforation with three clips; and **D,** complete healing with residual scarring 1 month after treatment.

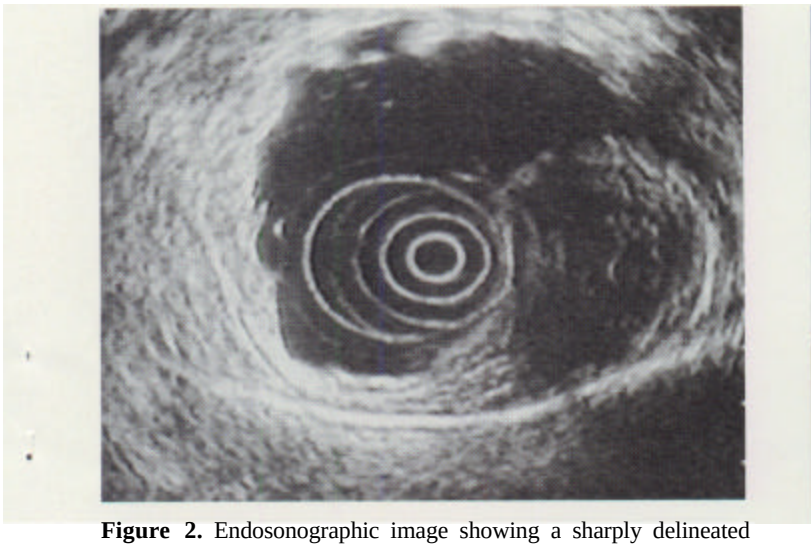

Figure 2. Endosonographic image showing a sharply delineated hypoechoic lesion. The origin of the submucosal tumor from the muscularis propria suggests a leiomyoma. No vascular structures were seen within or surrounding the tumor.

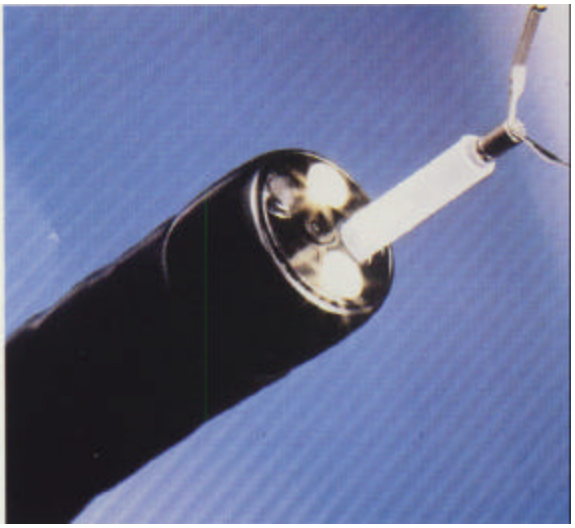

Figure 3. Photograph of open metallic clip. The clip extends from a delivery catheter, which is inserted through the working channel of an endoscope.

the wall. After transection, a 2.0-cm mucosal defect was noted, exposing the underlying muscle layer; a 0.5-cm perforation was noted at the center of this defect (Fig. 1B).

We used metallic clips (MD 850, Olympus Corp., Tokyo, Japan) to close the perforation. These were applied with a clip-delivery catheter (HX-3L, Olympus Corp.), which was passed through the working channel of the endoscope (Fig. 3). Tissue flanking both sides of the perforation was grasped with the open clip prongs (7 mm distance between the prongs), and then the prongs were closed to bring together the perforation edges. A total of three clips were required to completely close the perforation (Fig. 1C). Free perforation was confirmed on plain upright roentgenograms (Fig. *4).* The patient was placed on bowel rest, intravenous H2 Mockers, and broad-spectrum antibiotics. Histologic examination of the resected tumor specimen revealed a leiomyoma without evidence of malignant elements. The patient had an unremarkable clinical course, without abdominal pain, increase in temperature, or leukocytosis. He was discharged on the fifth hospitalization day. A follow-up endoscopy 1 month later showed complete healing, with residual scarring at the tumor transection site (Fig. 1D).

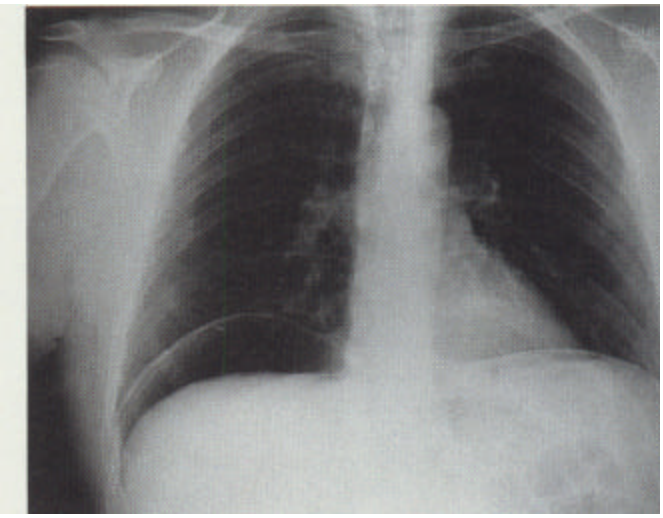

Figure 4. Plain upright film of the abdomen showing free air under the right diaphragm.

DISCUSSION

Metallic clips were introduced nearly two decades ago in Japan for marking lesions of the gastrointestinal tract and to mechanically arrest gastrointestinal bleeding.' Recent technical improvements of both the clip and clip-delivery system have made clips easier to place.2~ s

We found the clips easy to apply for this novel application. The prongs opened to a distance of 7 mm, which was adequate to grasp both sides of the perforation site. On closure of the prongs, the edges were fully brought together. We applied three clips to close the entire length of the perforation.

This case illustrates the feasibility, but also the risks, of endoscopic snare excision of a gastric leiomyoma. Yu, Luo, and Wand[4] recently reported endoscopic snare resection of submucosal lesions in 14 patients, of whom 2 had sessile leiomyoma of the stomach (1.5 and 2 cm in size). No complications occurred. Snare resection of a 2.5-cm pedunculated gastric leiomyoblastoma was reported by Papazian et a1.[5] We urge caution when resetting leiomyoma of the gastrointestinal tract by snare cautery, even when these lesions are pedunculated and mobile.

"Mini-perforations" of the colon have been reported to spontaneously close without laparotomy.[6] However, large perforations usually require prompt surgery. An argument can therefore be made for attempting endoscopic

closure, provided that close in-hospital surveillance and surgical back-up is available. Signs of peritonitis or infection mandate immediate surgery.

In conclusion, clips can be used to close perforations of the gastrointestinal tract. The application of this technique is currently limited by the size of commercially available clips; larger perforations will require larger clips.

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