

# New Technologies and Approaches to Endoscopic Control of Gastrointestinal Bleeding



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## KEYWORDS

- Over-the-scope clip • Endoscopic suturing • Radiofrequency ablation • Cryotherapy
- Endoscopic ultrasound • Gastrointestinal bleeding • Hemostasis

## KEY POINTS

- Emerging approaches for endoscopic hemostasis include over-the-scope clips, endoscopic suturing, mucosal ablation devices, fibrin glue injection, hemostatic spray, and endoscopic ultrasound-guided angiotherapy.
- These novel techniques may be applied as initial treatment or as rescue therapy for refractory bleeding.
- Given the experimental nature of some of these new devices for hemostasis, adequate informed consent is essential.
- The successful application of these technologies depends on proper lesion selection and operator experience in the use of these devices.

## INTRODUCTION

Gastrointestinal (GI) bleeding is a common problem encountered by all gastroenterologists. Established endoscopic techniques to assist in the treatment of GI bleeding include epinephrine injection, through-the-scope clips, monopolar or bipolar coagulation, and band ligation. Because refractory GI bleeding may occur despite these therapies, new technologies are emerging to assist in the treatment algorithm. These include endoscopic methods (ie, over-the-scope clips [OTSC; Ovesco Endoscopy AG, Tubingen, Germany], endoscopic suturing, hemostatic sprays, mucosal ablation

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devices, stent placement, fibrin glue injection) and endoscopic ultrasound (EUS)-guided angiotherapy (ie, coil and/or glue injection). This article highlights the technique and clinical application of these new technologies. Hemostatic sprays, stent placement for hemostasis, and injection therapy are discussed elsewhere in this issue.

## EMERGING ENDOSCOPIC THERAPIES FOR GASTROINTESTINAL BLEEDING

### *Endoscopic Over-the-Scope Clip*

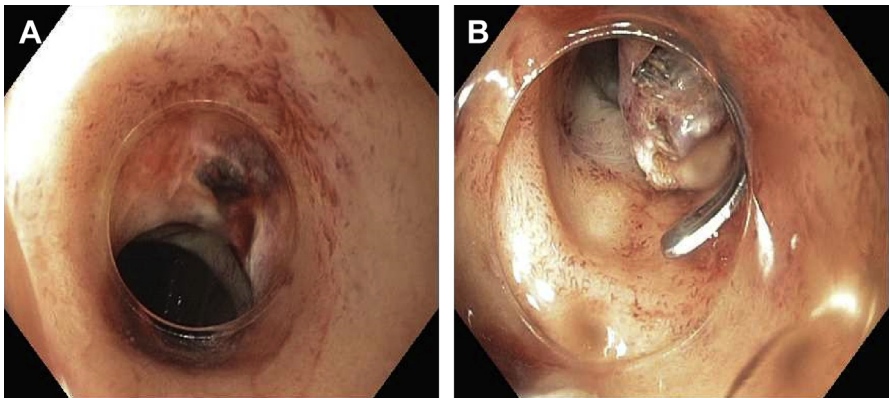
#### **Technique**

An OTSC has been approved in the United States since 2011 for endoscopic therapy of GI defects.<sup>1</sup> The caps are available in three diameters (11, 12, and 14 mm) and two working depths (3 and 6 mm), whereas the clip itself has three types of teeth (atraumatic or blunt-toothed, traumatic or sharp-toothed, and gastrostomy closure). Typically the atraumatic or traumatic clip is used for hemostasis (**Fig. 1**). The setup and deployment of the OTSC system is similar to a band ligator. The OTSC cap is affixed at the tip of the endoscope, with a string wire that runs through the scope channel connected to the deployment system that sits at the entrance port of the suction channel. Once the targeted lesion is identified, suction is applied to bring the entire lesion into the cap, followed by clip release by rotating the hand wheel of the deployment system. For fibrotic or indurated lesions, such as chronic ulcers, a dedicated tripronged anchoring device can be used to help retract the targeted lesion into the cap.

A Padlock clip (Aponos Medical Corp, Kingston, NH) is another OTSC. With this clip, the wire runs alongside the shaft of the endoscope, leaving the suction channel free to allow for better suction capability and passage of other accessories. Deployment is achieved by squeezing a handheld device. The clip has six circumferential prongs that provide radial compression on all sides and has been shown to be effective for closure of defects made in porcine stomachs and colons.<sup>2,3</sup> However, there are no clinical publications to date regarding its application for GI hemostasis.

#### **Clinical applications**

A randomized trial compared the OTSC with two standard hemoclips (Resolution Clip, Boston Scientific, Natick, MA; and QuickClip2, Olympus, Tokyo, Japan) on spurting vessels created at several different locations in an ex vivo porcine stomach.<sup>1</sup> All 45 sites (15 for each clip) were successfully treated with the assigned clip. The OTSC required significantly less time and number of clips to achieve hemostasis compared with the other clips. In the fundus, the OTSC was also thought to be more effective in



**Fig. 1.** (A) Duodenal ulcer with pigmented protuberance. (B) Over-the-scope clip placement.

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