

Can we now recommend OTSC as first-line therapy in case of non-variceal upper gastrointestinal bleeding?



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In the management of patients with acute non-variceal upper gastrointestinal bleeding, endoscopic hemostasis and acid suppression have significantly improved outcomes [1–3]. However, 8% to 15% of patients continue to bleed or develop further bleeding [3,4]. Further bleeding remains one of the most important predictors of mortality [3,5,6]. Research, therefore, has been focused on methods to improve endoscopic hemostasis, and thus mortality.

The standard of care in endoscopic hemostasis is either application of contact thermocoagulation or mechanical therapy such as haemostatic clips [7–9] with or without pre-injection with diluted adrenaline. However, there are limitations to conventional hemostatic methods. In an *ex vivo* bleeding model using canine mesenteric arteries, endoscopic thermocoagulation could only consistently seal arteries up to 2 mm [10]. Hemostatic clips achieve hemostasis through mechanical tamponade over the bleeding vessel. However, tangential application of hemostatic clips can be difficult in lesions located in the bulbous duodenum and the lesser curvature of the stomach. Furthermore, the clips often dislodge, leading to recurrent bleeding. Application of clips can also sometimes be difficult in chronic ulcers with a fibrotic base. The Over-The-Scope-Clip (OTSC; Oversco Endoscopy AG, Tübingen, Germany) has been successfully used to close perforations of the gastrointestinal tract and to control gastrointestinal bleeding [11]. With a wider jaw and greater strength, the OTSC has the advantages of a firm grip over a larger amount of tissue. Clip retention is almost universal.

To date, only small-scale retrospective series with the device have been performed. Kirschniak et al reported the first clinical experience with OTSC for gastrointestinal bleeding and achieved 100% primary hemostasis with no rebleeding [12]. In another series including 30 cases in which conventional endoscopic hemostasis had failed, the authors reported a 97% success rate for primary hemostasis and 6% rebleeding rate [13]. In our series where we also included cases refractory to conventional endoscopic treatment, we achieved a 10/10 (100%) success rate for primary hemostasis. However, rebleeding occurred in 22% [14]. From the limited data available, a 97% to 100% primary success rate was achieved [11–17]. However, the rebleeding rate ranges from 0% to 22% [11–17].

In this latest issue of *Endoscopy International Open*, one of the largest experiences with OTSC in management of patients with nonvariceal upper gastrointestinal bleeding (NVUGIB) has been published. Wedi et al reported their 6-year experience with 100 patients from two academic centers in Germany. In this study, a 94% success rate for primary hemostasis was reported. However, 3 of the 6 patients in whom initial OTSC placement failed died. Of the 94 patients in whom the procedure succeeded, 5 developed an early rebleed (within 24 hours) and 3 developed a late rebleed (≤ 30 days). Four of these 8 patients died consequently. The mortality following failed OTSC application was high.

In another recently published cohort of 100 patients including treatment of both NVUGIB and lower gastrointestinal bleeding, similar results were found [18]. Sixty-nine patients had NVUGIB treated with OTSC, either as first-line or salvage

treatment. Primary failure was significantly lower when OTSC was applied as first-line rather than second-line treatment (4.9% vs 23%; $P=0.008$). In a multivariate analysis, patients who had OTSC placement as second-line treatment had a significantly higher rebleeding risk as compared to those who had OTSC as the first treatment (OR 5.3; $P=0.008$). This was expected as patients who developed further bleeding after conventional treatment represented a selected group with higher risk of further bleeding. The authors also found that patients with a Rockall score of 7 or greater experienced fewer rebleeding episodes when treated with OTSC (214/457 (46.8%) vs 8/43 (18.6%); $P=0.0003$). They argued for use of OTSC in the high-risk groups. In the series, the rebleeding-associated mortality rate for patients with NVUGIB was 11%. Unsuccessful primary endoscopic hemostasis was found to be an independent risk factor for mortality [19]. These findings underscore the importance of a durable primary control of bleeding.

We all know that OTSC, if applied correctly, provides good control. But when does it fail? And how can we improve the success rate? To successfully place the OTSC, an en face view of the bleeding lesion is crucial, which is sometimes difficult to achieve, especially with ulcers located in the posterior wall of the duodenal bulb. OTSC deployment also can be difficult with scope in retroflexion. A technical point is to use a smaller OTSC and an anchoring device to puncture near the bleeding site to guide the OTSC. Moreover, in actively bleeding ulcers, where the base of the vessel was not well seen, pretreatment with adrenaline injection improved visualization.

Schmidt et al. presented final results of the STING trial that enrolled patients with refractory bleeders. The rate of freedom from rebleeding with use of OTSC at day 30 was significantly higher (30.8% vs 78%; $P=0.004$) [20] when compared to conventional treatment with either thermal methods or hemoclips. We eagerly await publication of the full results. Use of OTSC as primary treatment has not been compared to current standards. Such a randomized controlled trial is required. This primary use of OTSC seems logical as further bleeding is associated with substantial mortality [5,6]. In a systematic review, factors that predict further bleeding include hemodynamic stability, comorbid illness, active bleeding ulcers, large ulcers, and ulcers at posterior duodenum and lesser curve [21]. These lesions are clear candidates for application of OTSC. Such an approach will also likely benefit patients at high cardiovascular risk or at high risk of further bleeding. Finally, a cost analysis is required. We speculate that the added cost in managing further bleeding after standard treatment likely outweighs the cost of OTSC.

Competing interests

None

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