Bleeding peptic ulcers resistant to endoscopic treatment: Calling for a surgeon or an interventional radiologist?

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Acute bleeding is the most common complication of peptic ulcer disease and about half the cases of upper gastrointestinal bleeding (UGI) are caused by gastric and duodenal ulcers [1]. First-line endoscopy achieves bleeding control in as many as 98% of patients [2]. Despite these measures, the mortality rate in patients with bleeding peptic ulcers remains as high as 5 to 10% [1] due to a combination of advanced age, multiple co-morbidities, and high transfusion requirements. Current treatment algorithms for massive UGI bleeding recommend aggressive correction of coagulation disorders followed by endoscopy [2]. Endoscopic therapy with epinephrine injection and heat probe coagulation is the most reliable method. Rebleeding is usually managed with a second endoscopic attempt. Severe bleeding despite conservative medical treatment or endoscopic intervention occurs in 5 to 10% of patients [2] and requires surgery or transcatheter arterial embolization (TAE). In selected patients judged to belong to the high-risk group (ulcers 2 cm or greater in size located at the lesser curve and posterior bulbar duodenal, shock on presentation, and elderly with comorbid illnesses), a more aggressive postendoscopy management is warranted. The optimal course of action is unclear. Most would be expectant and offer medical therapy in the form of acid suppression. The role of early elective surgery or angiographic embolization in selected high-risk patients to forestall recurrent bleeding remains controversial. Surgery is associated with mortality rates as high as 20 to 40% [2,3]. Indeed, with advances in therapeutic endoscopy, patients who developed failed endoscopic hemostasis are likely to be poor surgical candidates with multiple comorbidities.
Although endovascular management is not included in the treatment algorithms for UGI bleeding from peptic ulcers described in surgical textbooks, selective catheter-directed embolization has been proposed as a less hazardous alternative to surgery, especially for high-risk patients [4,5], and is now considered in many institutions as the first-line intervention for massive bleeding from gastroduodenal ulcers after failed endoscopic treatment. The use of endovascular embolization is supported by the high technical and clinical success rates in our last study (95 and 71.9%, respectively) [5] as well as in main published case series over the past decade [2,4]. Indeed, outcomes after embolization have compared favorably with those of surgery thanks to enormous advances in endovascular device development in the recent years, including essentially lower-profile catheter systems and newer embolic agents, such as detachable microcoils, resorbable particles and cyanoacrylate glue.

The obvious advantage of transcatheter embolization is avoidance of a laparotomy in a critically ill patient, decreasing postsurgical morbidity and infectious complications. Indeed, Chiu et al. [3] recently reported high rates of complications and 30-day mortality whatever the surgical approach used, minimal (ulcer plication or ulcerectomy) or definitive (vagotomy or gastrectomy). The highest morbidity (47.6%) and mortality (40.5%) rates were reported in the cohort where minimal surgery was performed in the majority of cases, with a rebleeding rate of 38%. Then, the median length of hospital stay (20.3 days) correlated with these data. These results are difficult to accept. We recently reported our results obtained during nearly 10 years of experience with arterial embolization used to treat refractory massive bleeding from gastroduodenal ulcers [5]. We had 60 critically ill patients with a mean age of 69.4 years, the largest case series in the literature. The complications and 1-month mortality rates were 10 and 26.7%, respectively, with a rebleeding rate of 28%. Only 7 (11.6%) of the 60 patients needed surgery after failure of embolization procedures. In most cases, embolization obviates the need for surgery in critically ill patients whose immediate survival depends on their underlying conditions. In a recent review of the literature [6], we analyzed results of 15 studies (819 patients, mean age 65 years) on endovascular management of intractable nonvariceal UGI bleeding. Embolization-related complications developed in 9% (74) of patients and included access site or contrast-related complications, dissection of the target vessel, and liver and spleen infarction. Most of them had no clinical impact. On the other hand, arterial embolization in the UGI tract above the ligament of Treitz is generally considered very safe because of the rich collateral supply to the stomach and duodenum. Ischemic complications after embolization that required surgery was almost nil in our review but the risk of significant ischemia is known to increase in patients with previous surgery within the same area [7].

To date, no controlled trial has compared angiographic embolization with surgery as a salvage procedure for failed endoscopic therapy. The wide array of alternatives for the treatment of UGI bleeding from peptic ulcers after endoscopic failure make the decision of when to resort to emergency surgery more difficult, especially in patients with risk factors for recurrent bleeding and death, which are also related to high surgical risk. Law et al. [8], in a randomized controlled study, showed no differences in bleeding control between a second endoscopic treatment and surgery after initial endoscopic treatment failure for bleeding peptic ulcers. During endoscopy, active bleeding, large ulcer size, location of ulcer at posterior bulb duodenum, and lesser curve have been identified as predictors for endoscopic failure [2]. Embolotherapy may be particularly attractive in such a setting because it is not as invasive as surgery and has few complications [4,5]. Another advantage of TAE is that most patients with recurrent bleeding after initial treatment with surgery or TAE can be effectively treated with TAE, thus avoiding a second surgical procedure [4].

Three retrospective studies compared the two techniques and showed at least similar efficacy in terms of rate of rebleeding, morbidity, and mortality, whereas there was a bias of selection since arterial embolization was preferentially used for high-surgical-risk patients. These data suggest that surgery would have probably been catastrophic in this patient population and that embolization offered better results. Ripoll et al. [9] retrospectively analyzed the outcome of 70 patients with refractory peptic ulcer bleeding. Thirty-one patients underwent angiographic embolization and 39 patients were managed with surgery. Although patients receiving angiographic embolization were 10 years older, and more patients had heart disease and coagulation disorders, the incidence of recurrent bleeding (29 vs. 23%) and mortality was similar (26 vs. 21%). Another retrospective comparison study by Eriksson et al. [10] included 40 patients who underwent angiographic embolization and 51 patients who underwent surgery after failed endoscopic therapy. The angiographic embolization group was older and had more comorbidity. Thirty-day mortality was lower in the angiographic embolization group (3 vs. 14%). More recently, Venclauskas et al. [11] compared these two treatment strategies. Arterial embolization was performed in 24 patients and open surgery in 50 patients after unsuccessful endoscopic therapy for bleeding duodenal ulcers. The mean age and Apache II score were significantly higher in the embolization group. Only mortality in high-risk patients (Apache II score ≥ 16.5) was significantly lower in the TAE group (23.1 vs. 50%). These results are promising, and we are eagerly awaiting results of randomized controlled trials to prove the benefits of angiographic embolization, though they will be difficult to set up in the emergency setting. In the mean time and although hard evidence is lacking, decision-making in refractory bleeding from peptic ulcers could be based on endoscopy and patient's
condition. Negative or impractical endoscopy because of severe bleeding in hemodynamically unstable patients should prompt urgent angiography, whereas re-endoscopy should be first considered in stable patients. Continuing bleeding demands for emergency embolization, especially in high-operative-risk patients. In all cases, every effort should be made to perform angiography with embolization early after bleeding onset since longer time to angiography is known to be predictor of early rebleeding after TAE [5]. On the other hand, some authors state a preference for surgery in young and healthy patients, especially with large and/or multiple peptic ulcers at endoscopy, without having proved the inferiority of embolization in such a setting. Thus, in our institution, surgery is typically reserved for those patients whose bleeding failed to respond all previous treatments.

In conclusion, massive bleeding from a peptic ulcer remains a challenge. Optimal management required a multidisciplinary team of skilled endoscopists, intensivists, experienced UGI surgeons, and interventional radiologists. Endoscopy is the first-line treatment. The role for early elective surgery or angiographic embolization in selected high-risk patients to prevent rebleeding remains controversial. However, technological advances will probably broaden the indications for endovascular treatment of UGI bleeding from gastroduodenal ulcers after failed endoscopy. Although prospective studies are needed to compare these management strategies, the available data suggest that TAE is a good alternative to surgery and could be considered the salvage treatment of choice after failed endoscopic treatment. However, only high volume centers having access to sophisticated angiography rooms equipped with rotating gantries, and with 24-hour on call experienced and skillful interventional radiologists performing at least five endovascular embolization procedures per month, have the opportunity to use this technique as an alternative treatment.

Conflicts of interests : none.

References