Case report

DUODENAL ULCER MANAGED BY INTERVENTIONAL RADIOLOGY – A CASE REPORT

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Summary

Intractable bleeding from gastric and duodenal ulcers is associated with significant morbidity and mortality. Aggressive treatment with early endoscopic hemostasis is essential for a favourable outcome. In 12%-17% of patients, endoscopy is either not available or unsuccessful. Endovascular therapy with selective catheterization of the culprit vessel and injection of embolic material has emerged as an alternative to emergency operation in high-risk patients. There is no systematic literature review to assess the role of embolotherapy in the treatment of acute upper gastrointestinal bleeding from gastroduodenal ulcers after failed endoscopic hemostasis. Here, we present an overview of indications, techniques, and clinical outcomes after endovascular embolization of acute peptic-ulcer bleeding and illustrate it with a case from our practice. Our review shows that transcatheter arterial embolization is a safe alternative to surgery for massive gastroduodenal bleeding that is refractory to endoscopic treatment. It can be performed with high technical and clinical success rates, and should be considered the salvage treatment of choice in patients at high surgical risk.

Key words: duodenal ulcers, acute bleeding, endoscopic hemostasis, embolotherapy

Introduction

Acute upper gastrointestinal bleeding is one of the most important emergency situations. Peptic ulcer bleeding is the most common cause of upper gastrointestinal bleeding, responsible for about 50% of all cases, followed by oesophagitis, erosive diseases and variceal disease. Peptic ulcer disease occurs most commonly in duodenal bulb and stomach, the possible complications being: bleeding, re-bleeding, obstruction, penetration, perforation. In case of acute hemorrhage from upper gastrointestinal tract (UGI), the endoscopic evaluation is essential for the diagnosis and initial treatment. In 85% of the cases this kind of intervention suffices to stop the bleeding. [1, 2]. Despite the measures undertaken, the mortality rate in patients with bleeding peptic ulcers remains high – 5% to 10% [3, 4] due to a combination of advanced age, multiple co-morbidities, and high transfusion requirements [5]. The endoscopic appearance of a bleeding ulcer can

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be used to predict the likelihood of recurrent bleeding on the basis of the Forrest classification, which ranges from I to III. High-risk lesions for re-bleeding include: those characterized by active spurting of blood (grade FIa) or oozing blood (grade FIb). Ulcers, in which endoscopic hemostasis fail, often erode into large arterial complexes (a lesser curve gastric ulcer - into branches of left gastric artery and posterior bulbar duodenal ulcer - into goastroduodenal or pancreaticoduodenal arteries). Patients who have bleeding ulcers with high-risk stigmata as determined on endoscopy should undergo endoscopic hemostasis in addition to aggressive correction of coagulation disorders - as proposed by the current treatment algorithms for massive UGI bleeding [6, 7]. Despite conservative medical treatment or endoscopic intervention, severe bleeding occurs in 5% of patients [8] and requires surgery or transcatheter arterial embolization.

Transcatheter arterial embolization as an alternative to surgery for the control of UGI bleeding was introduced by Rösch et al. [9] in 1972. The typical candidate presents with massive bleeding or hemodynamic instability that has not responded to conservative medical treatment that combines volume replacement, proton pump inhibitors, and at least one endoscopic procedure aimed to control the bleeding [10]. At this point, surgery is offered to low-risk patients, while percutaneous embolotherapy is recommended to high-risk patients. Finally, endovascular treatment can be used if the bleeding recurs after surgery [11-14].

Sacks [15] performed a meta-analysis of 25 randomized controlled trials that compared endoscopic hemostasis to standard treatment. The systematic review showed that endoscopic therapy reduced the risk of recurrent and continued bleeding (69% relative reduction), emergency surgery (62% relative reduction), mortality (30% relative reduction). However, in 15% to 25% the once endoscopically treated lesion rebleeds (Table 1). The recurrence of bleeding after a successful endoscopic hemostasis arises the following questions:

1. What are the limits of endoscopic treatment?
2. When to make the decision on surgical treatment?
3. When interventional radiology should be considered?

Patients who rebleed are often elderly and at high surgical risk, and they are likely to benefit if endoscopy is repeated with satisfactory results. But if this approach fails again, the situation requires the development of alternative therapeutic approaches. Angiography with trans-catheter embolization is an example of an alternative method, providing a nonoperative option for patients in whom the acute rebleeding is difficult or impossible to control by endoscopy [15].

Case report

We present the case of a 61-year old woman with a recurrent duodenal bleeding, who was referred to our department from the emergency room. The patient presented with acute pain and melena. Past history included operation for ovarian cancer and liver resection for liver metastases several years before.

After diagnostic and therapeutic endoscopy, the diagnosis was duodenal ulcer F Ib (Figure 1). Endoscopic hemostasis by electrocoagulation was successfully achieved (Figure 2). On the 4th day of hospital stay, a new portion of melena was diagnosed and an endoscopic hemostasis was achieved once again.

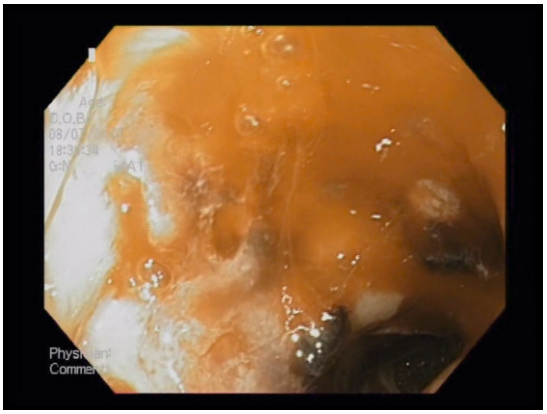

Figure 1. Ulcer Forrest Ib – Oozing blood

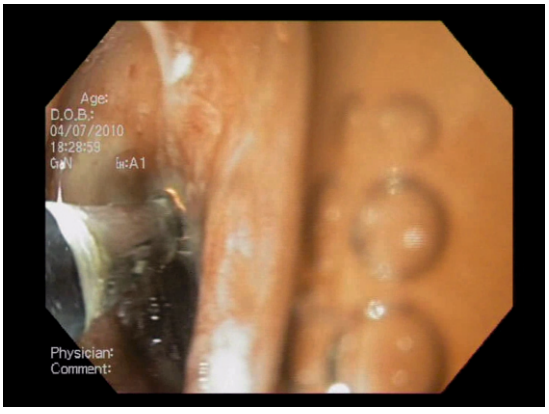

Figure 2. Electrocoagulation of the bleeding ulcer

Table 1. Independent predictors of rebleeding after endoscopic therapy

Independent predictors of rebleeding after endoscopic therapy					
Predictor	**Study**	**% Rebleeding in Entire Study Population**	**% Rebleeding in Patients with predictor**	**% Rebleeding in Patients without predictor**	**Odds ratio (95% CI)**
Hemodynamic instability	Gugliemi	20 (86/429)	41.1 (30/73)	14.8 (54/366)	3.68 (1.99-6.81)
	Wong*	8.3 (94/1.28)	19.2 (35/182)	6 (56/946)	2.21 (1.4-3.48)
	Thomopolous*	22 (86/390)	47.1 (24/51)	16 (54/339)	2.31 91.33-6.97
	Brullet (DU)*	16.7 (17/102)	32.0 (8.25)	12.3 (10/81)	3.53 (1.27-4.1)
	Park	20 (25/127)	NR	NR	NR
Comorbid illness	Villanueva	24.5 (57/233)	36.5 (42/115)	12.7 (15/118)	NR
	Saeed	12 (8/69)	NR	NR	Likelihood ratio 7.63, P=0.005
Active bleeding	Gugliemi	20 (86/829)	20.3 (39/192)	18 (45/247)	14.47 oozing, 13.38 spurting
	Wong*	8.3 (94/1.128)	12.1 (71/587)	4.2 (23/541)	1.65 (1.07-2.56)
	Chung	25.2 (35/139)	NR	NR	6.48 (1.88-22.49)
	Thomopolous*	22 (86/390)	48.9 (46/94)	10.8 (32/296)	2.45 (1.51-3.93)
	Brullet (GU)*	13.1 (23/175)	26 (13/50)	8 (10/125)	2.98 (1.12-7.91)
Large ulcer size (⩾ 2cm)	Gugliemi	20 (86/429)	31.3 (40/128)	14.1 (44/311)	4.61 (2.20-9.64)
	Wong*	8.3 (94/1.128)	14.8 (36/244)	6.6 (7/108)	1.80 (1.16-2.83)
	Brullet (GU)*	13.1 (23/175)	23.9 (16/67)	6.5 (7/108)	3.64 (1.34-9.89)
	Brullet (DU*)	16.7 (17/102)	36.3 (8/22)	12 (10/84)	2.29 (1.13-10.9)
Large ulcer size (>1)	Villanueva	24.5 (57/233)	42.0 (34/81)	15.1 (23/152)	NR
Posterior duodenal ulcer	Thomopolous*	22 (86/390)	43.2 (16/37)	17.6 (62/353)	2.48 (1.37-7.01)
	Park	20 (25/127)	44 (11/25)	13.7 (14/102)	NR
	Villanueva	24.5 (57/233)	57.1 (20/35)	18.7 (37/198)	NR
Lesser gastric ulcer	Brullet (GU*)	13.1 (23/175)	22.9 (16/70)	6.7 (7/105)	2.79 (1.01-7.69)
	Park	20 (25/127)	35 (7/20)	16.8 (18/107)	NR

Abbreviations: DU, Duodenal ulcer; GU, Gastric ulcer; NR, Not reported.
* Percentage of patients experiencing rebleeding was not available. Percentage of patients experiencing overall failure (defined as the failure to achieve initial hemostasis and recurrent hemorrhage) is reported.
Data from Elmunzer BJ, Young SD, Inadomi JM, et al. Systematic review of the predictors of recurrent hemorrhage after endoscopic hemostatic therapy for bleeding peptic ulcers. Am J Gastroenterol 2008;103:2625–32.

After reaching an endoscopic hemostasis five times, for a period of 21 days, the patient continued to deteriorate due to rebleedings. After consultations with a surgeon, endoscopist, ICU-specialist, gastroenterologist, radiologist, and a hematologist, a decision was made that the patient was indicated for angiographic embolization to achieve permanent hemostasis. A catheterization after Seldinger, with further selective embolization of the gastroduodenal artery was undertaken at the angiography unit of St. Marina University Hospital – Varna. A permanent hemostasis was gained (Figure 3). The side effects observed were: 4 episodes of nausea; fever to 38.2°C for 3 days; acute pain, controlled by metamisol.

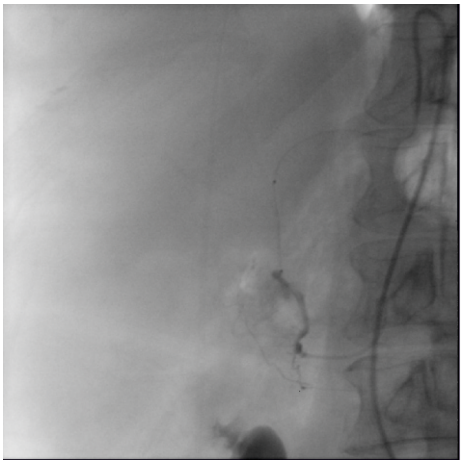

Figure 3. Angiographic view after the selective embolization of gastroduodenal artery was performed

Discussion and conclusion

Massive recurrent bleeding from a peptic ulcer remains a challenge. A multidisciplinary team of the specialists mentioned above, has a role to play. Endoscopy is the first-line treatment. Even with larger ulcers, endoscopic hemostasis can be achieved in the majority of cases [16]. Surgery is clearly indicated in patients in whom arterial bleeding cannot be controlled by endoscopy. Angiographic embolization is an alternative, particularly in cases unfit for surgery – selected patients estimated to belong to the high-risk group: ulcers 2 cm or greater in size located at the lesser curvature and posterior duodenal bulb, shock on presentation, elderly patients with comorbidity. Angiography allows the bleeding artery to be assessed, and coil embolization of larger arteries may further add to endoscopic hemostasis. However, technological advances, including more sophisticated catheter systems, 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 transcatheter arterial embolization is not only a good alternative to surgery, but should now be considered the salvage treatment of choice after failed endoscopic treatment.

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