Upper gastrointestinal massive bleeding successfully treated intra-operatively with a collagen and thrombin-based high-viscosity gel for haemostasis. Case report

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SUMMARY: Upper gastrointestinal massive bleeding successfully treated intra-operatively with a collagen and thrombin-based high-viscosity gel for haemostasis. Case report.

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A 57-year-old male patient was admitted to our Department for a non-variceal upper gastrointestinal massive bleeding. In accordance with the clinical guidelines, the patient underwent an early endoscopy (within 24 hours from admission), which showed the source of bleeding in the second portion of the duodenum. An endoscopic haemostatic injection with dilute adrenalin (epinephrine, 1:10.000) was then performed. After 8 hours, severe recidive bleeding occurred with reduced haemoglobin levels, which led us to an emergency surgical treatment.

A gastric resection was performed, followed by the application of high-viscous gel (Floseal®) into the source of bleeding within the duodenal lumen. This technique allowed to obtain a definitive haemostasis without long-term complications.

Our experience suggests that the intra-operative application of Floseal® can be an effective alternative to traditional haemostatic techniques in the emergency surgical treatment of upper gastrointestinal bleeding. This also provides additional time to perform other haemostatic techniques avoiding the precarious haemodynamic conditions of a patient in emergency.

Key Words: Non-variceal upper gastrointestinal bleeding - Haemostasis - Floseal® - Esophagogastroduodenoscopy - Gastrectomy.

Introduction

Upper gastrointestinal bleeding is a medical and surgical emergency with an annual incidence of 170 cases for every 100,000 adults. Despite recent innovations in treatment, the mortality rate has remained unchanged (6-8%). This could be due to an increasing average age and a higher co-morbidity rate (1). The diagnosis and treatment for patients with upper gastrointestinal bleeding is centred on an esophagogastroduodenoscopy (EGD) which can play either a diagnostic or therapeutic role.

EGD allows the source of bleeding to be identified in 90% of cases if carried out within 12 hours of bleeding onset and, at the same time, it enables haemostasis by various means (2). In the case of non-variceal bleeding, the current method of choice is the combination of a thermal agent and injection treatment (1-3). In the
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B.L., a 57 year-old male, was admitted into our emergency department for an episode of hypotnia. The patient had not lost consciousness, he was cold and sweating, with an arterial pressure of 98/48 mmHg, a heart rate of 78 bpm, respiratory rate of 18 breaths per minute, oxygen saturation of 96% and a body temperature of 36°C. The haematocrit (Hct) = 30.0%; 2 - Hb = 9.5 g/dl, Hct = 28.6%; 3 - Hb = 8.0 g/dl, Hct = 24.4%) (Fig. 1) with lavages via nasogastric probe indicating clear active bleeding and, thus, the need for an emergency surgical treatment (3, 5) An additional transfusion of concentrated red blood cells was carried out.

Surgical procedure

Basing on the endoscopic examination which had located the source of bleeding in the second duodenal portion, and following gastro-epiploic detachment, the duodenum and the lesser and greater gastric curves were mobilized, and a gastric resection was performed. The duodenum was explored and this manoeuvre revealed an ulcerous lesion copiously bleeding, with active haemorrhagic duodenitis in the second and third duodenal portions.

To compensate for the significant intra-operative blood losses (Hb = 4.7 g/dl, Hct = 15.0%), blood flow was maintained through the intravenous infusion of plasma expander (2,500 ml), physiological / Ringer’s solution (5,000 ml), noradrenaline (2 ml/hr of an 8 mg/50ml solution), and four bags of concentrated red blood cells. This infusion treatment aimed toward the maintenance of a proper arterial pressure for systemic perfusion (100 / 50 mmHg), and the restriction of blood loss.

Simultaneous visual monitoring of the lumen of the duodenal stump and a temporary, induced increase in blood pressure, allowed us to identify the approximate source of the active bleeding. However, it was not possible to stop the bleeding through the usual surgical haemostatic methods. Clipping, suture or other techniques were contraindicated due to the deep location of the site and of an obscured visibility by the leaking blood. The intraoperative view was worse than the EGD report. Because of the patient’s serious conditions, we planned to perform a duodenocholangiopancreatography and decided to apply high-viscosity, collagen- and thrombin-based gel (FloSeal®, Baxter Biosurgery,
Fig. 1 - Laboratory tests.
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Wien, Austria) (11 – 16) as a haemostatic measure within the duodenal lumen. Four vials of the gel were applied, with manual compression for 3–5 minutes using a moist gauze after each vial. This allowed effective haemostatic control, which was certified by raising of the patient’s blood pressure and monitoring patient’s status for 15–20 minutes. Then we closed the duodenal stump and performed a Billroth II transmesocolic gastroenteroanastomosis.

Post-operative care

Once surgery was completed, the patient was admitted into intensive care unit for a continuous monitoring. The patient received intravenous crystalloid solution (3,000 ml), four more bags of concentrated red blood cells, six bags of plasma and two vials of albumin in order to restore an adequate blood flow. Additionally, omeprazole (40 mg / 24 hours) and piperacillin (4 g / 8 hours) were administered intravenously.

Twenty-four hours later, after a satisfactory improvement in vital signs (arterial pressure 140 / 80 mmHg, heart rate 78 bpm) and better laboratory test results (Hb = 10.7 g/dl; Hct = 32.8%) (Fig. 1), the patient came back to the emergency surgery unit where infusion treatment was carried out with crystalloid solutions (3,000 ml) and one vial of albumin every 12 hours. Treatment for rebleeding was also continued, consisting in intravenous ranitidine (50 mg / 6 hours), somatostatin (250 mcg / 6 hours), and tranexamic acid (500 mg / 6 hours), plus oral sucralfate (2g / 5 hours) (6-8).

Post-operative antibiotic treatment was started and continued until the patient acquired conscious. With the onset of fever on the third post-operative day (body temperature 38°C), antibiotic treatment was turned into intravenous piperacillin/tazobactam (4,500 g / 6 hours), plus oral metronidazole (500 mg / 8 hours). The patient’s fever abated on the fifth post-operative day, and subsequent post-operative progress was normal.

Outcome and follow up

The patient was discharged from our hospital in good condition on the 15th post-operative day, and was assigned for clinical and instrumental follow up to check the regularity of gastrointestinal flow and the absence of iatrogenic lesions in the Vater ampulla. For this purpose, an EGD and an upper abdominal echography were performed 7 months post-operatively. The EGD was carried out through the second duodenal portion, and showed intact hyperaemia of the terminal oesophagus, cardia incontinence, a normal gastric stump in terms of morphology and mucous characteristics, a significant amount of bile, and a normal anastomosis and duodenal loop. The upper abdominal echography showed increased liver size with a regular echostucture, biliary ducts of normal diameter, multiple lichiasis in the cholecystis with thickened walls as in chronic inflammation, and no visible liquid collections.

Discussion and conclusion

In our clinical case, the application of high-viscosity collagen- and thrombin-based gel for haemostasis (FloSeal®, Baxter Biosurgery, Wien, Austria) into duodenal stump allowed the successful resolution of an extremely problematic situation both in terms of patient’s haemodynamic condition and of difficult surgical access, without long-term complications.

As there is no significant number of similar cases in literature, we cannot state certain conclusions about the haemostatic efficacy of this technique. We can, however, state that in the case of duodenal bleeding, once the site of bleeding has been identified, the intraluminal application of haemostatic gel can represent a useful alternative and contribution to conventional surgical methods for haemostasis. Depending on the seriousness of the bleeding extent, the hemostasis achieved could either be temporary or permanent.

The advantage of this method lies in the ease and speed through which haemostasis can be achieved, which means that the patient’s haemodynamic condition can be steadied, providing the opportunity to undertake further conventional haemostatic techniques. Furthermore, the use of FloSeal® could make these conventional methods easier because visibility is improved due to reduced local bleeding. In our case, the direct application of the gel onto the source of bleeding allowed us to achieve permanent haemostasis, so we did not need to perform other haemostatic techniques on the site of bleeding. This technique could be especially useful in the upper gastrointestinal bleeding, when the surgeon could apply this haemostatic gel through a single gastrotomy/duodenotomy without requiring a gastrectomy, which would also lower the patient’s morbidity and mortality rate. Even though the collagen and thrombin-based gel haemostasis may only be temporary, the gained time could be very important to achieve the patient’s haemodynamic stability.

References