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# Use of the endoscopically applied hemostatic powder TC-325 in cancer-related upper GI hemorrhage: preliminary experience (with video)

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Upper GI hemorrhage is a common complication of gastroduodenal tumors.<sup>1</sup> Bleeding from these neoplasms is generally difficult to control and is associated with high rebleeding rates. Current modalities for management include endoscopy, radiotherapy, interventional angiography, and surgery.

Hemospray (Cook Medical, Winston-Salem, NC) is an emerging endoscopic hemostatic technology that was recently introduced in the management of upper GI bleeding.<sup>2</sup> It is composed of a proprietary inorganic powder that, when put in contact with moisture in the GI tract, becomes coherent and adhesive, thus serving as a mechanical barrier for hemostasis. Given its malleable nature, its ability to cover large areas, and especially the lack of direct contact with target tissue as it is sprayed onto the lesion, its use in bleeding gastroduodenal tumors has been suggested.<sup>2</sup> Animal studies have demonstrated its safety and its lack of absorption by the GI tract; it is also eliminated within 48 hours of application with no reported bowel obstruction.<sup>3</sup> Recently, a prospective, pilot study involving 20 patients with nonmalignant upper GI bleeding showed that the application of Hemospray was associated with a 95% initial hemostasis with no active bleeding seen on repeat EGD at 72 hours, followed by total elimination of the inorganic substance without complications such as intestinal obstruction or embolization.<sup>2</sup>

To our knowledge, the following describes the first 5 reported cases of upper GI hemorrhage secondary to gas-

trointestinal tumors that were successfully treated with Hemospray. These were consecutive cases.

## CASE 1

A 74-year-old woman with inoperable metastatic gastric adenocarcinoma was admitted to the hospital with a 1-week history of progressive abdominal pain culminating in an episode of coffee ground emesis. In the emergency department, she was found to be hypotensive (systolic blood pressure of 90 mm Hg) and tachycardic (heart rate of 130 beats/min). Her initial hemoglobin count was 70 g/L from a documented baseline of 100 g/L in the previous month. Her platelet count was  $200 \times 10^9/L$  with an international normalized ratio (INR) of 1.17. The patient was started on intravenous pantoprazole (80-mg bolus followed by 8 mg/h) and resuscitated with fluid and 2 units of packed red blood cells (PRBC). At the time, she refused nasogastric tube insertion and endoscopic management. The patient remained stable over the ensuing 24 hours with conservative therapy without evidence of further active bleeding and was transferred to a medical ward. Two days after admission, acute hematemesis developed with an estimated blood loss of 1.5 L. She was given 4 units of PRBC. After careful discussion with the patient and her family, an EGD was performed, demonstrating a large antral mass that was actively bleeding. Hemospray (20 g) was applied to the tumor with successful hemostasis. The patient remained hemodynamically stable after EGD without further signs of active bleeding. Two treatments of radiotherapy were given 5 days after endoscopy. No rebleeding occurred and the patient was discharged 20 days later.

## CASE 2

A 69-year-old man with a medical history of chronic obstructive lung disease was transferred from a rural hospital with a 2-day history of hematemesis and a 1-week history of intermittent vomiting and melena. The patient also reported epigastric pain with food, progressive dysphagia to solids, and significant weight loss over the past 4 months. An EGD performed at the referring hospital revealed a large distal esophageal mass suspicious for

*Abbreviations: INR, international normalized ratio; PRBC, packed red blood cells.*

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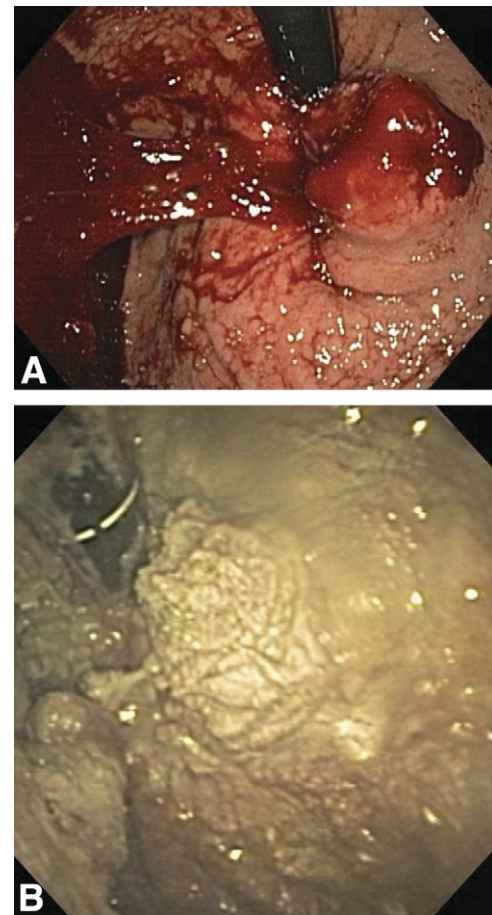
malignancy. On arrival at our facility, the patient was hemodynamically stable with a hemoglobin count of 91 g/L (unknown baseline), platelets of  $184 \times 10^9/L$ , and an INR of 1.01. A repeat endoscopy showed Barrett's esophagus and a firm mass in the esophagus (subsequently characterized as undifferentiated adenocarcinoma with signet ring cells) extending from 32 to 48 cm from the incisors and involving the gastric cardia. The tumor bled on contact and developed constant oozing after biopsies; 15 g of Hemospray was applied with good hemostasis. Oral pantoprazole was started after the procedure (40 mg/d), and the patient remained stable without clinical signs of ongoing hemorrhage. The cancer was deemed to be inoperable after CT and positron emission tomography imaging, and the patient was referred for chemotherapy. No recurrent bleeding was noted 13 days after Hemospray therapy.

### CASE 3

A 58-year-old woman with diabetes and hypertension was initially admitted to the hospital with a history of chronic epigastric pain. A CT and US scans of the abdomen revealed a  $5.8 \times 3.6 \times 3.9$ -cm mass in the head of the pancreas with no lymphadenopathy. An EGD revealed an erythematous nodular area in the bulb of the duodenum from which biopsy specimens were taken. EUS detailed the pancreatic mass as invading the common bile duct, duodenum, and the portal confluence; needle aspiration confirmed poorly differentiated adenocarcinoma. The patient was scheduled for neoadjuvant radiotherapy followed by surgical resection. However, soon after the initial diagnosis, the patient presented with an episode of fresh blood hematemesis. She was found to be tachycardic (heart rate of 120 beats/min) but not hypotensive (systolic blood pressure  $>100$  mm Hg). Her initial hemoglobin count was 79 g/L, from a baseline of 120 g/L noted 1 month earlier, requiring transfusion of 2 units of PRBC (platelet count  $484 \times 10^9/L$ , INR 0.94). An EGD demonstrated an ulcerated mass in the duodenal bulb that was actively oozing. Approximately 20 g of Hemospray was administered with good results. No rebleeding occurred at 41 days post Hemospray use.

### CASE 4

A 53-year-old woman with a recent diagnosis of stage IIIA non-small cell lung cancer presented to the hospital with upper GI bleeding. The malignancy had previously been deemed unresectable, and the patient had started chemotherapy. On the day of the index admission, the patient presented to the oncology clinic feeling unwell with a hemoglobin count of 78 g/L from a baseline of 90 g/L noted 1 week earlier. Her platelet count was  $288 \times 10^9/L$  with an INR of 1.08. She was immediately transferred



**Figure 1.** Bleeding gastric cardia mass before (A) and after (B) Hemospray application.

to the emergency department where she was noted to be tachycardic (heart rate 126 beats/min) with a blood pressure of 97/64 mm Hg requiring transfusion of 4 units of PRBC. Intravenous pantoprazole was started; an EGD showed a large ulcerated necrotic mass involving the gastric cardia that underwent biopsy. No active bleeding was noted on the initial endoscopy. Pan CT scan revealed dramatic progression of the cancer with several new metastatic deposits in the abdomen and the brain. The patient had recurrent melena within 24 hours post-EGD with hemodynamic instability, needing 2 additional units of PRBC. Repeat gastroscopy showed active oozing from the previously observed friable mass requiring Hemospray application (part of a 20-g canister) with good results (Fig. 1). Five days later, the patient's hemoglobin count dropped from 86 g/L to 66 g/L. There was also a decrease in the platelet count from  $182 \times 10^9/L$  to  $95 \times 10^9/L$  with an abnormal INR of 1.24, raising the possibility of disseminated intravascular coagulation. After appropriate resuscitation, a third EGD was performed showing the same large lesion that was actively bleeding managed with diffuse reapplication of Hemospray (20 g) with immediate hemo-

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