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Case Report

Emesis of an enteral bullet: A rare case of bullet embolism to the thoracic esophagus

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ABSTRACT

A case of migration of a foreign body from the stomach to the thoracic esophagus is described. The bullet was successfully retrieved endoscopically after exploratory laparotomy was performed to address the patient's injuries. Enteral migration of bullets is a rare phenomenon that should be considered when the location of retained ballistic fragments is inconsistent with gunshot wounds and expected trajectories.

Introduction

Bullet emboli are rare complication of gunshot injuries. Among the few cases reported, enteral migration is a small minority. The presentations of bullet emboli may involve an unexplained bullet trajectory, and their elusive nature may lead to missed injuries. This report explores a case of an intraluminal esophageal bullet in a patient with multiple gunshot wounds to the abdomen, injury to the stomach, and no evidence of injury to the esophagus.

Case presentation

A 27-year-old woman with no significant past medical history was brought to Boston Medical Center, an urban level one trauma center, by Emergency Medical Services after sustaining multiple gunshot wounds. On primary survey she was lethargic and vomiting so was intubated for airway control. Breath sounds were auscultated bilaterally before and after intubation. Her heart rate was 125 beats per minute and her blood pressure 106/51 mm Hg. Resuscitation was initiated with whole blood. On secondary survey she had ballistic wounds to the lower back, abdomen, and left upper and lower extremities.

Chest X-ray in the emergency department showed a metallic foreign body overlying the mid-mediastinum without any evidence of associated injuries to the chest such as pneumothorax or hemothorax (see Fig. 1). The patient's hemodynamics had normalized after receiving blood and crystalloid, and the operating room was alerted and preparing for our arrival. Given the obvious need for exploratory laparotomy and the concern for intrathoracic injury on chest X-ray, CT scan was performed to aid in cavitary triage. On CT scan there was a bullet in the middle of the mediastinum without associated pneumomediastinum or any other suggestions of injury to the thorax (see Fig. 2). There was evidence of bullet fragments at the inferior vena cava (IVC) and splenic injury.

The patient was taken to the operating room. A foley catheter was placed with efflux of pink urine. Upon abdominal exploration, there was a moderate amount of hemoperitoneum in the left upper quadrant and pelvis. At the right side of zone one of the

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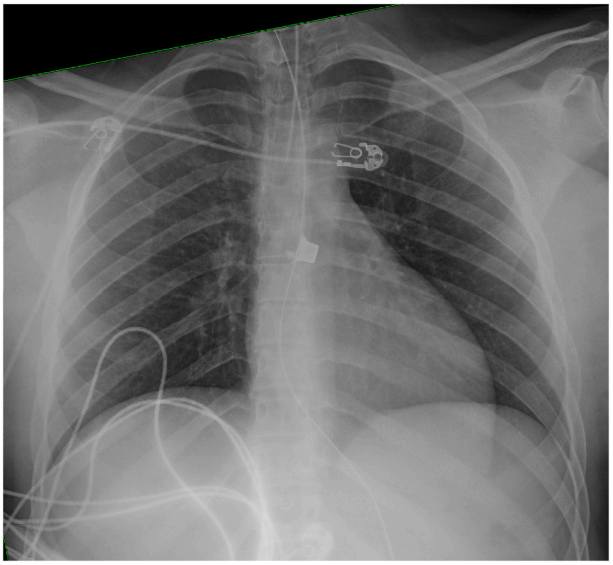

Fig. 1. Chest X-ray showing bullet fragment projecting over the mediastinum and no hemothorax or pneumothorax.

Fig. 2. Computed tomography scan of the thorax showing bullet fragment within the posterior mediastinum.

retroperitoneum, there was a hematoma corresponding with the possible IVC injury. The hematoma did not appear to be rapidly expanding. There was damage to the spleen that was not amenable to salvage, so splenectomy was performed. Two ballistic wounds to the stomach – both at the body of the stomach, one anterior and one posterior – were temporarily controlled with clamps. A 20-centimeter segment of small bowel with multiple ballistic injuries was resected and the bowel was left in discontinuity. Bilateral medial visceral rotations were performed. There was no evidence of disruption to the colon. The retroperitoneum was entered and the IVC injury was identified, controlled, and repaired with a bovine patch. The two gastric injuries were then repaired with stapled wedge resections.

After the abdominal hemorrhage and contamination were controlled, we investigated the mediastinal bullet fragment. An endoscope was introduced in the mouth and through the esophagus. The bullet fragment was encountered in the mid-esophagus at about 30 cm from the incisors and retrieved with an endoscopic basket (see Fig. 3). The entire esophagus was examined and was normal without any evidence of traumatic injury. The patient had responded well to fluid resuscitation throughout the operation but was hypothermic, so the abdomen was temporarily closed with a negative pressure wound manager and the patient was brought to the Surgical Intensive Care Unit.

The following day the patient returned to the operating room for repair of a bladder injury seen on CT cystogram as well as bowel reanastomosis and abdominal closure. She remained hospitalized for ten postoperative days for diet advancement, further management of her bladder injury, and physical rehabilitation.

Discussion

Embolism refers to migration of a substance from one site to another. Bullets can be propelled through the body by many forces

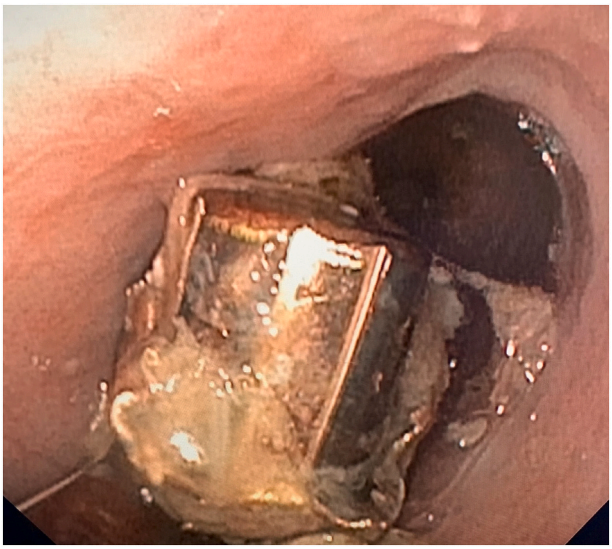

Fig. 3. Endoscopic view of bullet within the intact esophagus at about 30 cm from the incisors.

including the flow of blood, air, and urine. Bullet migrations within the vascular system, respiratory tract, brain, spinal canal, peritoneum, pericardium, genitourinary tract, and gastrointestinal (GI) tracts have been documented in case reports and several small case series [1,2]. The phenomenon is extremely rare, and most reports regard intravascular embolization of bullet fragments [3,4].

Expectoration of a bullet [5], and even expectoration followed by swallowing of a bullet have been reported [6]. Anterograde bullet migration in the GI tract has been reported several times, for example from the small intestine to the colon [7] and, in one exceptional case, from the suprascapular soft tissues to the biliary system to the colon [8]. Retrograde bullet migration within the gastrointestinal tract to the esophagus however, has not been described.

In this patient's case, the coincidence of ballistic wounds to the stomach, emesis on presentation, and a bullet within the lumen of an uninjured esophagus suggests emesis of an intragastric bullet. She did not have any wounds to the neck or thorax, there was no evidence of damage to the thoracic cavity, and she did not have any complications - such as pleural effusions, mediastinitis, or sepsis - following the injury that would indicate a missed esophageal injury.

Migratory bullets can give rise to a confusing clinical picture and result in delay in diagnosis. In some cases, this can have morbid or even fatal consequences such as limb ischemia, missed bowel injuries, and sepsis. This case highlights the importance of a high degree of suspicion when encountering a scenario where bullet wounds and trajectories do not match.

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