Case Report

Seatbelt Syndrome with Gastric Mucosal Breaks and Intra-Gastric Wall Air Leakage

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Abstract

As numerous reports were published regarding the so-called seatbelt syndrome involved in car crashes, most of them were mentioned about small intestine, duodenum and colon perforations and solid organ bleeding. No reports have been published regarding multiple gastric mucosal tears with intra-gastric wall air leakage with massive bleeding. A 65-year-old woman was admitted after a motor vehicle crash. She vomited massive fresh blood. Gastric mucosal breaks, approximately 5 cm in length, were observed. Computed tomography imaging revealed multiple gastric mucosal breaks. We report a rare case wherein a traffic accident caused a serious condition associated with massive digestive bleeding.

Key words: seatbelt syndrome, gastric mucosal breaks, massive bleeding, serious condition


Introduction

Numerous case reports have described the so-called seatbelt syndrome in school-aged children involved in car crashes (1-3). Most of these cases involved small intestine, duodenum, and colon perforations and solid organ bleeding (4). No reports have been published regarding multiple gastric mucosal breaks with intra-gastric wall air leakage associated with massive bleeding that caused a serious condition involving decreased hemoglobin (to 6.8 g/dL) and an approximately 68 mmHg decrease in blood pressure following a car crash. It is important to be aware of differential diagnoses that may cause serious conditions associated with massive gastric bleeding, similar to that observed in our patient.

Case Report

A sixty-five-year-old woman was admitted after a motor vehicle crash by ambulance car 30 minutes later, complaining of severe abdominal pain. As the seatbelt was sliding up over the abdomen when the car crash occurred, seat-belt shaped subcutaneous hemorrhage by contused wound of her upper abdomen was seen. In the emergency department, she suddenly vomited massive amounts of fresh blood, and her blood pressure decreased by approximately 68 mmHg 50 minutes later after the accident. Her blood hemoglobin level decreased from 12.8 g/dL to 6.8 g/dL. After her blood pressure was stabilized by blood transfusion and drip infusion with gastric lavage by nasogastric tube, an emergency endoscopic examination was performed 90 minutes later after the accident. Longitudinal mucosal breaks, approximately 3 to 5 cm in length, and injuries were observed throughout the stomach (Fig. 1). These injuries, characterized by an irregular ulcer margin and a deep ulcer floor, appeared similar to a crush wound (Fig. 2, 3). One of these mucosal breaks in the anterior wall of the stomach continued bleeding, and the wound extended slightly above the muscularis propria of the gastric wall. We were able to observe the dissected submucosal layer using hemostasis forceps. A computed tomography scan demonstrated multiple deep, straight injuries of the gastric mucosa Fig. 4 and the presence of air in the intragastric wall (Fig. 5, 6). Fortunately, free air was not located in the abdominal cavity. Endoscopic hemostasis was performed using hemostatic forceps to successfully stop the

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Received for publication December 19, 2014; Accepted for publication February 15, 2015

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bleeding. Gradually, her hemoglobin level recovered to 10 g/dL, and she survived.

Discussion

Although all drivers must wear their seatbelts by law in Japan, seatbelts can cause severe abdominal injuries if they are worn inappropriately.

The Japanese Association for The Surgery of Trauma categorized the digestive tract injury as non-transmural injury (subdivided into serosal, seromuscular tear and intramural hematoma) and transmural injury (perforation or transection). In this case, the patient’s body was thrown forward, and the location of the seatbelt over her abdomen resulted in large contusions of the abdominal wall as well as gastric

Figure 1. Endoscopic examination revealed numerous longitudinal mucosal breaks and injuries throughout the stomach (black and white arrows).

Figure 2. In the anterior wall of the antrum, a linear, deep mucosal break appears similar to a crush wound with an irregular margin and a deep ulcer floor (black arrows).

Figure 3. A short linear, deep mucosal break is evident (black arrows) in the greater curvature of the antrum.

Figure 4. Computed tomography imaging indicates a deep, sharp mucosal break in the gastric mucosa (black arrows).

Figure 5. Intra-gastric wall air leakage is present (white arrows).

Figure 6. Air leakage into the submucosal layer is clearly demonstrated slightly under the gastric mucosa (white arrows).
wall injury, which caused multiple gastric mucosal breaks with intra-gastric wall air leakage. Therefore, this case was categorized as the intramural hematoma or mucosal break with massive bleeding. However, there were no reports why the shapes of mucosal breaks of the stomach were longitudinal. But when it comes to mucosal break of the stomach, we sometimes experienced so-called “Mallory-Weiss syndrome” of which mucosal tear was longitudinal not vertical. Anatomically, digestive tract can expand more to radial direction than to longitudinal in peristalsis movement. With regard to traffic accidents, most emergency physicians tend to consider and diagnose abdominal damage as perforations of the small intestine and solid organ bleeding (5, 6). Small intestine and colon damage requires multiple intestinal resections, which result in short bowel syndrome and abdominal wall reconstruction. Moreover, post-operative complications, such as intra-abdominal sepsis, occur in some cases (7, 8).

No reports are available regarding the occurrence of multiple gastric mucosal breaks with intra-gastric wall air leakage associated with massive bleeding that caused a serious condition. This case highlights the need for the investigation and treatment of hemorrhagic gastric ulcers following the identification of the rare consequences of seatbelt injury.

Minimal mucosal breaks of the stomach might occur in some cases, however, the gastric deeper and larger mucosal breaks with massive bleeding was rare associated with seatbelt syndromes. It’s very important for us to be aware of differential diagnoses involving massive bleeding lead to serious condition similar to this case. Without an accurate diagnosis and emergency endoscopic hemostasis, serious conditions could result.

The authors state that they have no Conflict of Interest (COI).

References


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