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Case Report

A Case of Ischemic Ileal Obstruction Secondary to Seat Belt Trauma

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Abstract : We report a case of seat belt trauma with delayed ischemic ileal obstruction. A 62-year-old woman presented with symptoms and signs of bowel obstruction three weeks after an automobile traffic accident. A plain radiograph of the abdomen showed dilated small bowel loops with air fluid levels that were consistent with intestinal obstruction. Enhanced computed tomography clearly demonstrated a stenotic ileal loop with mural thickening that was associated with a mesenteric hematoma. Upper endoscopy revealed an ulcer of the ischemic ileal obstruction. The patient underwent resection of the stenotic ileal loop by single-incision laparoscopic surgery. The stenotic ileal loop was located 120 cm oral side from the terminal ileum. In gross finding, the wall of stenotic ileal loop was thickened and the adjacent mesentery was shortened with a hematoma. The mucosa of the ischemic ileal obstruction showed ulcerative changes. The abnormal ileal loop, which was 15 cm in length, was resected. Postoperative recovery was uneventful.

Key words : ileus, seat belt, abdominal injury

Introduction

Intestinal damage by blunt abdominal trauma is usually evident within hours or days after an accident. However, posttraumatic intestinal stenosis is characterized by a delayed onset of obstructive symptoms and diagnosis is often difficult[1-8]. We report a case of ischemic ileal obstruction secondary to seat belt trauma that was associated with mesenteric hematoma.

Case Report

A 62-year-old woman was admitted to the regional hospital for pain in the left shoulder, left forearm, left lower extremity and abdomen after an automobile accident. She was alert and hemodynamically stable. Clinical examination revealed an abdominal distension, decreased bowel sounds and rebound tenderness in the upper abdomen. A plain radiograph

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of the left shoulder, left forearm and left lower extremity showed multiple fractures. The patient improved with conservative treatment and demonstrated normal intestinal function. The patient experienced abdominal pain and nausea again three weeks after the accident. Her abdomen was distended, but clinical examination did not demonstrate any abdominal masses or tenderness. Enhanced computed tomography (CT) of the abdomen revealed a hematoma in the adjacent mesentery (Fig. 1A).

She was admitted to our hospital for ileus. A plain radiograph of the abdomen showed dilated small bowel loops with air fluid levels consistent with intestinal obstruction (Fig. 2). However, she occasionally passed flatus and stool after the admission. A second enhanced CT (six weeks after the accident) revealed an ileal stenosis with a thickened wall and narrow lumen, and a mass lesion in the adjacent mesentery that was consistent with hematoma (Fig. 1B). A third enhanced CT (nine weeks after the accident) revealed no improvement of ileal stenosis or dilated small bowel loops (Fig. 1C). Upper endoscopy revealed an ulcer of the ischemic ileal obstruction (Fig. 3). A gastrografin enema image of the small bowel then revealed stenosis of the ileum and a narrowed intestinal lumen (Fig. 4). We diagnosed an ischemic ileal obstruction secondary to seat belt trauma.

The patient underwent resection of the stenotic ileal loop by single-incision laparoscopic surgery (SILS). The stenotic ileal loop was located 120 cm oral side from the terminal

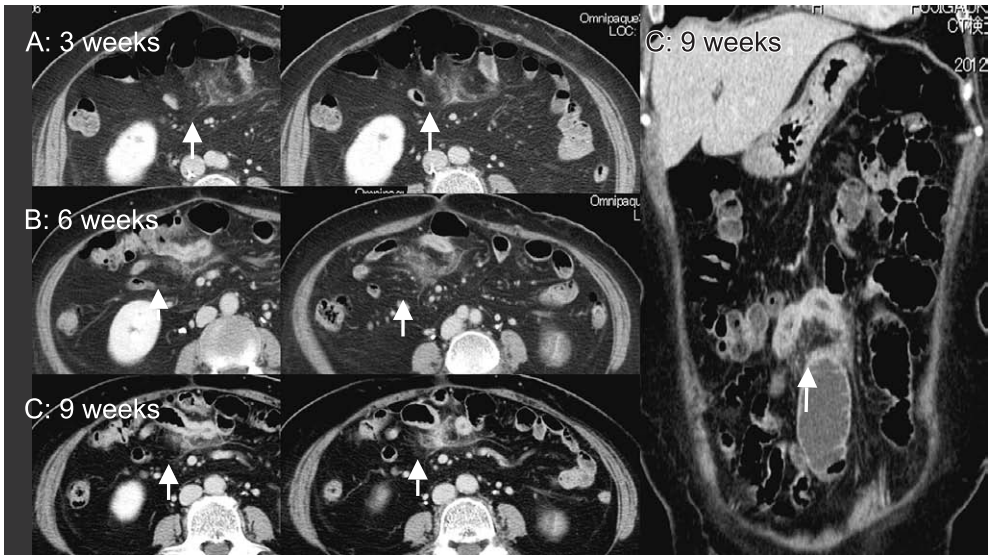

Fig. 1. Computed tomography

A: Enhanced CT showing a hematoma (arrows) in the adjacent mesentery (three weeks after the automobile accident).

B: Enhanced CT showing an ileal stenosis (arrows) with a thickened wall and narrow lumen (six weeks after the automobile accident).

C: Enhanced CT again showing an ileal stenosis and dilated small bowel loop (arrows) (nine weeks after the automobile accident).

Fig. 2. Plain radiograph
A plain radiograph of the abdomen showing dilated small bowel loops (arrow) with air fluid levels consistent with intestinal obstruction.

ileum. The wall of this loop was thickened, had brown discoloration, and was associated with a hematoma in the adjacent mesentery. There was no evidence of perforation. The abnormal ileal loop, which was 15 cm in length, was resected. The operation took 115 minutes, and there was little total blood loss. In gross finding, the wall of the stenotic ileal loop was thickened, and the adjacent mesentery was shortened, with a small hematoma (Fig. 5A). The mucosa of the ischemic ileal obstruction showed ulcerative change (Fig. 5B). Histological examination showed ischemic and fibrotic changes within the ileal wall. Three months after the surgery, the patient remained in good health.

Discussion

Intestinal and mesenteric injuries are found in approximately 5% of all patients undergoing laparotomy after blunt abdominal trauma[9, 10]. However, delayed small bowel obstruction after blunt abdominal trauma is a rare clinical entity, comprising less than 1% of nonpenetrating trauma admissions in some institutions[11]. Patients with this condition have a delayed onset of obstructive symptoms, and diagnosis is often difficult[1–8]. Therefore, patients should be questioned carefully about previous blunt trauma.

Diagnostic imaging has a role in the early diagnosis of blunt small bowel injuries. Contrast-enhanced CT should be performed early in patients with blunt abdominal trauma because most significant bowel and mesenteric injuries, as well as associated injuries to other abdominal viscera, are reliably identified by CT[9, 10, 12]. Transections or large perforations are

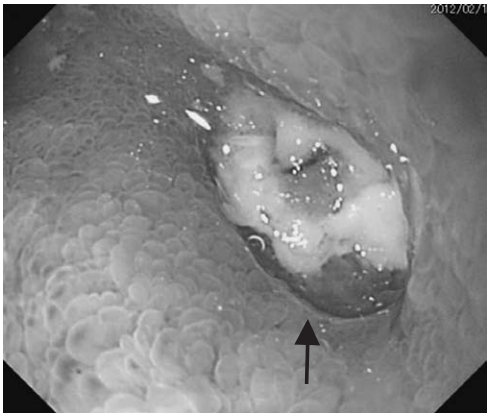

Fig. 3. Upper endoscopy
Upper endoscopy revealing an ulcer of the stenotic ileal loop.

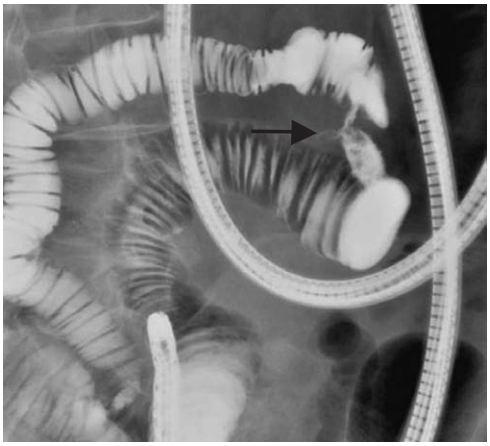

Fig. 4. Gastrografin enema
A gastrografin enema image of the small bowel showing the stenosis of the ileum and a narrowed intestinal lumen.

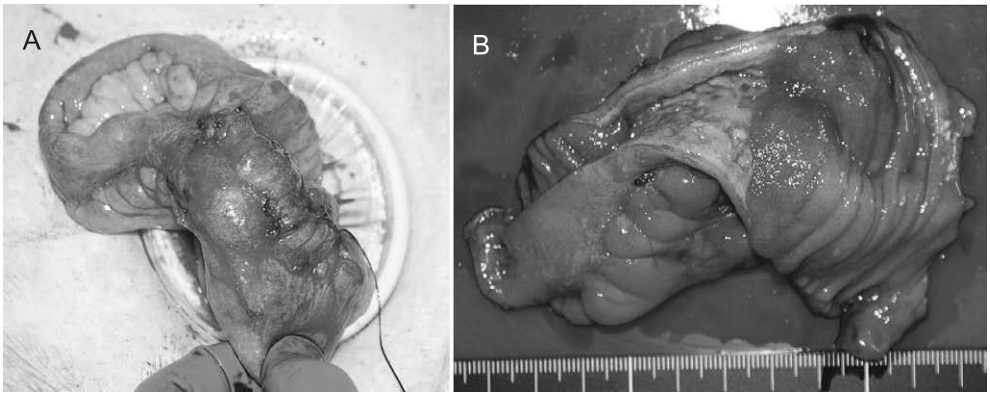

Fig. 5. Resected specimen
In the gross finding, the wall of the stenotic ileal loop was thickened, and the adjacent mesentery was shortened with a hematoma (A). The mucosa of the ischemic ileal obstruction showed ulcerative changes (B).

probably caused by shearing forces between the abdominal wall and the vertebral column. This mechanism might also cause injury to the bowel mesentery. In our case, the ileal stenosis with thickening of the bowel wall and a mesenteric hematoma was clearly demonstrated by enhanced CT. However, these CT images could not reveal the cause of the ileal stenosis. Upper endoscopy revealed an ulcer of the ischemic ileal obstruction, which was very useful in establishing the diagnosis. A gastrografin enema image of the small bowel then revealed the stenosis of the ileum and a narrowed intestinal lumen. A gastrografin enema image is considered a good technique for demonstrating lesions of the small intestine.

Because there was no improvement of the ischemic ileal obstruction, the patient underwent resection of the stenotic ileal loop by SILS. The stenotic ileal loop was located 120 cm from the terminal ileum. Transumbilical SILS was considered best in this case that lacked intestinal dilatation. Histological examination of the resected specimen revealed ischemic and fibrotic changes within the ileal wall.

Taylor, who reviewed the pathological findings of posttraumatic intestinal stenosis, reported that most lacerations occurred parallel and close to the involved intestine[8]. Bryner *et al* suggested that the stenosis is entirely caused by infarction resulting from mesenteric vascular damage, rather than direct injury to the intestine[2]. In our case, there was a mesenteric hematoma parallel to the involved ileum, although the mesenteric vascular damage was not directly confirmed during laparotomy.

Posttraumatic intestinal stenosis is an entity that is not widely recognized. Mesenteric vascular injury may induce chronic ischemia of the corresponding segment of small bowel, inducing secondary thickening of the bowel wall and intestinal ulcer. Ischemic ileal stenosis should be considered if a patient has abdominal pain with no prior abdominal surgery and with suspicion of partial small bowel obstruction several weeks after seat belt trauma.

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