

Bicycle-handlebar Hernia: A Rare Traumatic Abdominal Wall Hernia

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Handlebar hernia is a rare, traumatic, abdominal wall hernia caused by high-velocity direct trauma. It involves disruption of the abdominal wall muscles, with bowel loop herniated through the defect in the abdominal wall, and may have major or even lethal complications. We report a case of bicycle-handlebar hernia in a 9-year-old boy who had all layers of his abdominal wall disrupted by a fall when bicycling; however, his skin and intra-abdominal organs were completely intact. Computed tomography demonstrated subcutaneous intestinal loops protruding through the rent. Primary repair was performed, and his postoperative course was uneventful. [*J Chin Med Assoc* 2005;68(6):283–285]

Key Words: abdominal wall, handlebar hernia, primary repair, traumatic hernia

Introduction

Acute abdominal wall hernias caused by traumatic force are exceedingly rare.^{1,2} There are fewer than 70 cases reported in the literature. Handlebar hernias, which are localized defects, are even more infrequent, with only 28 cases reported since 1939.^{3–7} We report the case of a 9-year-old boy with handlebar hernia after a bicycle crash; the hernia was repaired primarily.

Case Report

A 9-year-old boy was brought to our emergency department soon after falling from a bicycle and hitting the right lower quadrant of his abdomen against the rubber-coated handlebars. The patient complained of pain and a bulge over the traumatized area.

Vital signs and initial laboratory data were normal. Physical examination of the abdomen revealed an area of ecchymosis and localized tenderness in the right lower quadrant, and a soft tissue bulge was also found. A computed tomography (CT) scan showed disruption of the external and internal oblique

abdominal muscles, transverse abdominal muscles, and peritoneum (Figure 1A). A loop of ileum was herniated into the subcutaneous fat layer, with perifocal spreading and intact overlying skin (Figure 1B), but without evidence of intra-abdominal organ injury (Figure 1C).

Handlebar hernia was diagnosed, and the child was referred to surgery. Surgical exploration of the injured area showed that all layers of the abdominal wall and peritoneum were disrupted, but there was no intra-abdominal organ injury. The defect in the abdominal wall was repaired in layers. Two months later, a CT scan showed satisfactory healing of the abdominal wall and the child was in a stable condition (Figure 2).

Discussion

Acute, traumatic, abdominal wall hernia is extremely rare.² It is caused by direct trauma from an object with insufficient force to penetrate the skin, but with sufficient force to disrupt the underlying muscle and fascia. This is possible because the skin is more elastic than the underlying layers. A direct and forceful blow

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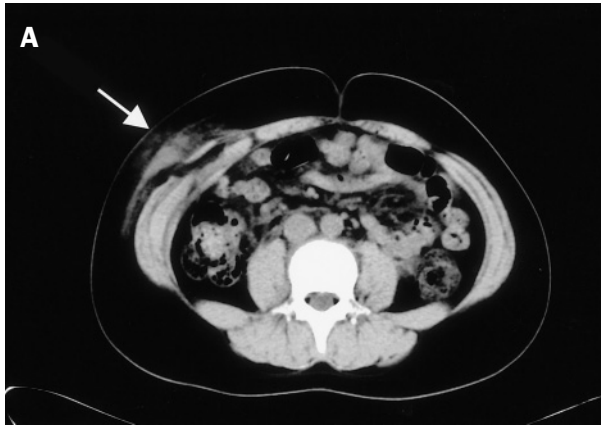


Figure 1. Bicycle-handlebar injury in a 9-year-old boy. (A) A non-contrast computed tomography (CT) scan shows edematous change of the focal subcutaneous fat layer in the right lower quadrant (arrow). (B) A contrast CT scan shows disruption of the external (E) and internal (I) oblique abdominal muscles, transverse (T) abdominal muscles, and peritoneum (curved arrow). (C) A contrast CT scan also indicates small bowel herniated into the subcutaneous fat layer, with intact overlying skin (arrowheads).

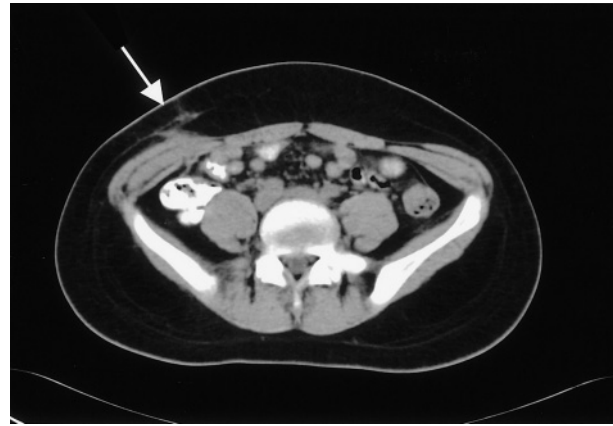


Figure 2. Contrast computed tomography scan 2 months later, showing good healing of the injury site (arrow).

to the abdomen, most commonly due to handlebar injury or falling from a height, has been described as the most common cause of acute, traumatic, abdominal wall hernia.^{8,9} Maunola and Kekomaki¹⁰ believed that only a specific type of injuring force, described as a “sudden, sharp, but not too severe” force, could cause abdominal wall rupture. Wood et al¹¹ categorized traumatic abdominal hernias into 3 types, depending on the size of the rupture and the cause of the injury: 1) small defects caused by blunt trauma; 2) larger defects sustained during motor vehicle crashes; and, rarely, 3) intra-abdominal bowel herniation in deceleration injuries.

The abdominal wall defect in handlebar hernia is often found in the lower abdomen, with only 2 cases reported in the upper quadrant.^{3,4,12} Clinically, abdominal pain and locally bulging soft tissue at the ecchymotic area are the most common presentations of handlebar hernia. Diagnosis of a hernia may depend on careful clinical examination of the abdominal wall, and on detailed recording of the patient history; however, this is not always possible in a patient with acute trauma. In the last decade, the widespread use of CT in patients with acute trauma has facilitated early diagnosis.^{1,8} CT is also useful for differentiating hernia from hematoma, to define the anatomy of disrupted abdominal wall layers,¹ and to evaluate associated injuries accurately.

The management of acute, traumatic, abdominal wall hernias mandates prompt surgical repair to prevent incarceration or strangulation.¹³ Such repair can be done with primary closure, if the condition of the surrounding tissue is good, or with prosthetic material if the defect is too large.^{6,12,13} Surgical treatment includes midline exploratory laparotomy or primary local repair; selection of the best approach should be done on a case-by-case basis. This case report illustrates

a case of successful primary local repair of abdominal wall hernia, without the need for midline exploratory laparotomy.

In conclusion, we believe that in all patients with traumatic abdominal injury, the possibility of abdominal wall hernia must be considered. CT examination can provide detailed information about the severity of injury to the abdominal wall and intra-abdominal organs. The management of patients with traumatic abdominal wall hernia must be undertaken on a case-by-case basis.

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