

An isolated complete pancreatic fracture primarily diagnosed by ultrasound

Primer olarak ultrasonografi ile tanı konan izole pankreas fraktürü: Olgu sunumu

Fatih KANTARCI, M.D., Bengi GÜRSES, M.D., Ramazan ALBAYRAK, M.D.,
Süleyman Hilmi AKSOY, M.D., Sebuğ KURUGOGLU, M.D., İsmail MİHMANLI, M.D.

Pancreatic fractures due to blunt abdominal trauma are rare and are usually symptom-free and silent in many cases. Therefore, a high degree of suspicion is required either early in the course of trauma or later during follow-up. Computed tomography (CT) is the primary imaging modality for the diagnosis of traumatic pancreatic injuries. In this report, we present a 10-year-old child in whom ultrasound enabled the detection of a complete fracture between the body and tail of the pancreas, while initial CT findings were not suggestive of a lesion. The need for ultrasonography is emphasized especially in the presence of a history of trauma even if CT scans appear normal.

Key Words: Abdominal injuries; pancreas; rupture; tomography, X-ray computed; ultrasonography; wounds, nonpenetrating.

Künt batın travması sonrası pankreas fraktürü oldukça nadirdir. Birçok olguda ise pankreas fraktürü yakınmasız ve sessiz seyreder. Bu yüzden, travma seyrinin erken döneminde ya da takiplerde pankreatik yaralanmanın gözden kaçmaması için şüpheli davranmak gerekir. Pankreas yaralanmalarında esas inceleme yöntemi bilgisayarlı tomografidir. Bu yazıda, 10 yaşında bir çocukta, bilgisayarlı tomografide görülemeyen, ancak ultrasonografi ile saptanan pankreas gövdesi ve boynu arasındaki fraktür sunuldu. Bilgisayarlı tomografi bulgularının negatif olduğu olgularda ultrasonografik incelemenin de yapılması gerekliliği vurgulandı.

Anahtar Sözcükler: Abdominal yaralanmalar; pankreas; yırtılma; bilgisayarlı tomografi; ultrasonografi; penetran olmayan yaralanma.

Pancreatic fractures due to blunt abdominal trauma are rare. Since pancreatic injuries are symptom-free and silent in many cases, a high degree of suspicion is necessary to ensure that pancreatic injuries are not overlooked, either early in the course of trauma or later during follow-up. Computed tomography (CT) is the primary imaging modality for the diagnosis of traumatic pancreatic injuries.

In this report, we present a case with complete fracture between the body and tail of the pancreas diagnosed primarily by ultrasound (US), which was not evident on CT examination.

CASE REPORT

A ten-year-old child was admitted to the emergency department following a car-pedestrian accidents, resulting in blunt abdominal trauma. On

admission, he had a stable hemodynamic state, but there was severe pain in the epigastric region. Computed tomography performed with a slice thickness of 5 mm and with 30 ml of intravenous nonionic contrast media was unremarkable for an abdominal organ injury. The pancreatic width, parenchymal integrity and density appeared normal (Fig. 1). There was no fluid collection around the pancreas, nor any density changes in the peripancreatic fat. Decreased hematocrit levels (36% initially, and 30% after 8 hours of follow-up), and a persistent and severe epigastric tenderness led to a diagnostic peritoneal lavage, which was found to be unremarkable. Amylase levels in the serum and peritoneal lavage fluid were 65 IU/L and 2 IU/L, respectively. A bedside gray scale US scan was obtained after 12 hours of admission to rule out any

parenchymal injury. It revealed a complete fracture of the body of the pancreas, and peripancreatic and free intraperitoneal fluid collections (Fig. 2). Color Doppler US could not be performed. There were no associated injuries to the liver or spleen. The patient underwent distal pancreatectomy and splenectomy, during which the diagnosis of pancreatic fracture was confirmed. Following surgery, his general condition was improved; follow-up CT and US examinations were normal and, a week later, he was discharged from the hospital.

DISCUSSION

Pancreatic injuries remain a relative enigma, even in modern medical practice with technology and advanced diagnostic methods. Despite initial difficulties in diagnosis, most minor pancreatic injuries are relatively easy to treat. However, previously undetected pancreatic injuries, whether mild or severe, may become a major therapeutic challenge to the medical team and a potentially disastrous situation for the patient.^[1-3] Generally, the mechanism of injury is midline compression against the vertebral column and shear load across the neck of the pancreas.^[4] Frequent causes include trauma from a steering wheel, seat belt, bicycle handlebar, or a football helmet. It is more common in young adults, possibly due to lesser retroperitoneal fat to act as a protective buffer. Isolated pancreatic injuries are rare. Other organ injuries, such as those involving the liver or duodenum usually coexist.^[5] Immediate laparotomy with repair or resection of the pancreas proximal to the fracture is curative. Delay in diagnosis may result in recurrent pancreatitis, and formation of a pseudocyst, fistula, or an abscess, leading to a mortality rate of 20%.^[1-3,5]

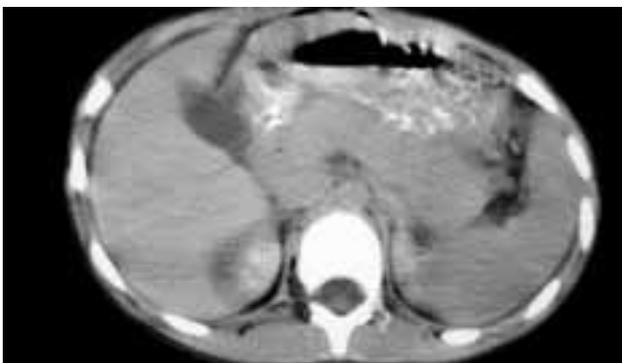


Fig. 1. An axial contrast-enhanced CT image shows normal pancreatic contour and parenchyma. No fluid collection is seen.

Pancreatic injuries may be frighteningly symptom-free and silent in many cases. Leukocytosis and hyperamylasemia, which are uncommon immediately after the trauma, are non-specific findings that may also result from a bowel injury.^[6,7] Serum amylase value of our patient was normal on admission. Amylase detected in diagnostic peritoneal lavage fluid is much more sensitive for pancreatic injuries than that found in blood or serum.^[7] However, these measurements are not routinely performed in most institutions, and because of the retroperitoneal location of this organ, diagnostic peritoneal lavage may be relatively insensitive to determine the presence of a pancreatic injury, and there is an increased likelihood of false-negative or equivocal results.^[2]

Computed tomography is the most effective imaging modality for the diagnosis of pancreatic injuries, but a high index of suspicion is required.^[6] The sensitivity of CT for detecting pancreatic injuries ranges from 33 to 100%.^[8-10] The spectrum of CT findings includes subtle edema or fluid in the peripancreatic fat, focal or diffuse pancreatic enlargement, irregularity of the pancreatic contour,



Fig. 2. A transverse plane US image of the pancreas demonstrates a linear fluid with full transection of the pancreas between the body and tail (arrows).

or a fracture line in the body or neck separating the long or short axis of the pancreas^[4,6,7,11] More remote signs include the presence of fluid around the superior mesenteric artery, in the transverse mesocolon or lesser sac, or between the pancreas and the splenic vein, and thickening of the left anterior pararenal fascia.^[11] Computed tomography images may be apparently normal during the early hours of the blunt injury.^[12] In our case, the pancreas appeared normal, with none of the above-mentioned findings. While CT has a high sensitivity in reported small series, its findings may be minimal even with pancreatic transection, since the elastic pancreatic parenchyma may preserve its normal contour.^[6]

Actually, when US is sufficient to show fluid around the pancreas, it is highly unlikely that CT would miss this event. In our case, discordant findings between CT and US must have resulted from the time lapse between these two modalities.

In a trauma patient, it is not practical to transport the patient for a repeat CT examination; instead, a bedside US may be more advisable. In our case, CT proved to be a problem-solving method. Moreover, it offers an easy, cost-effective, radiation-free, and quick examination requiring no administration of contrast material. There is no doubt that CT represents the primary modality for blunt abdominal trauma, but the use of US as an adjunctive method may well be justified in the presence of clinical suspicion, even if CT findings are normal.

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