Total Pancreatic Fracture Due to Blunt Trauma: Report of a Rare Case

Künt Karın Travmasına Bağlı Total Pancreas Kırılması: Nadir Bir Vaka Sunumu

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Özet

Künt karın travmasına bağlı olarak gelişen nadir bir pankreas fraktürü vakasını sunmaktayız. 70 yaşında erkek hasta araç içi trafik kazası geçirmiş, fizik muayene, ultrasonografi ve bilgisayarlı tomografi incelemeleri sonucunda pankres travmasından şüphelenilmiştir. Dalak yaralanması ve portal venin pankreasın hemen altından geçtiği bölgede total pankreatik fraktür tanısı magnetik rezonans kolanjiyopankreatografi ile konuldu. Hasta acilen operasyona alınarak splenektomi ve distal pankreatektomi uygulandı. Sunduğumuz bu vakada çok sık olarak karşımıza çıkmayan künt travmaya bağlı pankreatik fraktürü, komplikasyonlarını ve tanısal ve tedavisel zorlukları tartıştık.

Anahtar Kelimeler

Pankreas; Abdominal Yaralanmalar; Cerrahi Prosedürler

Abstract

A rare case of pancreatic fracture due to blunt trauma was presented. The patient was 70 year old male who had a motor vehicle collision and was suspected a pancreatic trauma due his examinations with ultrasound and computerized tomography. The diagnosis of splenic injury and pancreas body total fracture in the point where the portal vein crosses the pancreatic body was made with the help of magnetic resonance cholangiopancreatography. He was taken to emergency surgery where a splenectomy and a distal pancreatectomy were performed. We represented this infrequent case of pancreatic fracture and its complications after blunt abdominal trauma and discuss the diagnostic and management practices.

Keywords

Pancreas; Abdominal Injuries; Surgical Procedures

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Introduction

Blunt abdominal trauma can cause severe damages in all internal organs. Trauma to the pancreas especially isolated pancreatic trauma is a very uncommon incident in these injuries[1]. Pancreatic fracture due to abdominal blunt trauma reported to be 0.4 per 100 000 population [2] or 1 per 250 000 hospital admissions[3]. The diagnosis of a pancreatic fracture is challenging as the physical signs are often absent and laboratory parameters such as serum amylase are inaccurate for diagnosis[4]. As the diagnosis and the treatment are difficult, a combined morbidity and mortality rate of 50% has been reported[1]. It is critically important to provide early treatment in these patients, therefore; infrequent pancreatic injuries should certainly be considered in the differential diagnosis in blunt trauma cases.

Herein we represented a rare case of pancreatic fracture after blunt abdominal trauma and discuss the diagnostic and management practices.

Case Report

A 70 year old male admitted to the emergency service with severe abdominal pain after having a motor vehicle collision. He stated that he hit his chest and upper abdominal area through the steering wheel hardly during the accident. In his initial physical assessment; he was stable with a blood pressure of 160/80mmHg, heart rate of 96 /min and fever of 36.4 C. He had an abdominal tenderness especially in upper quadrants. A total blood count revealed a white blood cell count of 15000/mm3, hemoglobin of 12.6 g/dl and serum amylase of 800 iu /i. An ultrasound examination in the emergency service was initiated. A large hypo-echogenic area with dimensions of 10x8 cm was observed around the liver and spleen and interpreted as hematoma secondary to solid organ trauma. For further investigation a computed tomography (CT) scan was performed. Axial contrast-enhanced CT scans showed extensive spleen lacerations and a fracture line at the pancreatic body surrounded with fluid and hemorrhage between the pancreatic fragments. Depending on the CT findings magnetic resonance cholangiopancreatography (MRCP) was initiated and axial T2 weighted fat suppressed magnetic resonance (MR) image showed a fracture of the pancreatic body with associated fluid collections. Preoperative diagnosis of an acute abdomen due pancreatic fracture was decided and the patient underwent emergency surgery. In the exploration of the abdomen; a spleen rupture was seen with an intra-abdominal bleeding of approximately 2 liters of blood was suctioned. In addition, the mesentery of small and large intestine was found to be filled with hematoma due pancreatic fracture. A retroperitoneal dissection were performed and found that the pancreas body was fractured totally in the point where the portal vein crosses the pancreatic body. Pancreatic fluid leakage was also inspected. After the exploration; a splenectomy and a distal pancreatectomy were performed. A silicon drainage tube was placed in the resection area of the pancreas before the anatomical closure of the patient.

The patient follow-up postoperatively was uneventful and he was discharged from the hospital on day 4.

After one week of the discharge, he re-admitted to our clinic with severe pain of the abdomen and high fever of 39 C. He had a white blood cell count of 20000/mm3. CT scan examination showed multi centered fluid and abscess like fluid, and therefore the patient underwent relaparotomy. In the intraabdominal exploration; a close small intestine perforation adjacent to the resection area (due pancreatic fluid digestion) were found with intraabdominal multiple abscess foci. The perforated intestinal section was resected, the abscesses were drained as much as possible and the operation was ended with a replacement of silicon drainage. In the first postoperative day, the drainage fluid laboratory assessment showed very high amylase levels and an MRCP was planned. MRCP showed pancreatic fluid leakage from the resection area. An ERCP-guided stent placement is considered and nasobilliary drainage was obtained. After one week from the replacement of drainage and appropriate antibiotic and fluid replacement, a control ERCP was performed and no pancreatic leakage was detected. Consequently the drainage was moved out and the patient was discharged from the hospital after 4 days. The patient follow-up was done for two years in outpatient clinic bases and no complications were encountered till then.

Discussion

In adults, over 75% of blunt injuries to the pancreas are due to motor vehicle collisions[5].Blunt abdominal trauma may result in a variety of abdominal injuries most commonly involving the liver and spleen which are common and are usually detected by imaging without difficulty. Unfortunately pancreatic injuries may be more elusive and are uncommon. They may be overlooked in patients with extensive multi organ trauma and are associated with high morbidity and mortality due to fistula, abscess, sepsis, and hemorrhage, particularly if diagnosis is delayed [6, 7].

The pancreas is particularly vulnerable to crushing injury in blunt trauma due to impact against the adjacent vertebral column [8]. Two-thirds of pancreatic injuries occur in the pancreatic body, and the remainder occurs equally in the head, neck, and tail [9]. Yet in our case the trauma to the pancreas caused a serious fracture at the pancreatic body where the portal vein crosses the pancreas in addition with a spleen injury. The associated injuries as seen in our patient with spleen (could be liver, duodenum etc.) can occur in over 90% of the cases[3] .

Pancreatic injuries may be difficult to diagnose clinically because of the retroperitoneal location of the organ which mutes the clinical features of peritonitis.

Routine laboratory tests are of little help except for the elevation in serum amylase levels but they are neither specific nor sensitive for the diagnosis of pancreatic fracture [10]. In addition, the classical triad of fever, leukocytosis, and elevation of serum amylase levels is rarely encountered[11] . Elevation of serum amylase levels may be seen in only up to 73% of cases [3] . In our case the only laboratory findings were the anemia caused by internal bleeding and an elevated level of serum amylase which is found to be 800 iu/i. Actually, elevated levels of amylase focus our evaluation for further investigation of pancreatic injury.

Ultrasound scan is beneficial in emergency settings for the detection of free intra peritoneal fluid or a large hematoma that could consider a pancreas and associated vascular injuries, but

its capacity to show a specific damage to the pancreatic duct is limited[12].

In our case, the most helpful technique in the diagnosis of pancreatic fracture was depended on CT imaging and MRCP results. Advances in CT technology have enabled excellent demonstration of pancreatic parenchymal injuries. Helical multi-slice CT, which has both sensitivity and specificity as high as 80%, represents the best noninvasive diagnostic method for the detection of pancreatic injury. However, particularly in the initial phase, CT may miss or underestimate the severity of the damage because its accuracy in detecting major ductal injury is low. If the CT findings are suspicious or pancreatic injury possibility remains, MRCP may provide a clear demonstration of pancreatic duct disruption . In the past, ERCP was the only method available for evaluating pancreatic duct integrity[13]. The difficulty in performing ERCP in the acute setting, along with the associated risk of inducing iatrogenic pancreatitis in a traumatized patient, does not make this option favorable to most centers as an initial diagnostic tool.

The advantages of MRCP include noninvasiveness and greater availability than ERCP (endoscopic retrograde pancreatography). The main pancreatic duct can be identified by MR pancreatography within the pancreatic head in up to 97% of cases and within the pancreatic tail in up to 83% [14]. In addition, MRCP allows evaluation of the liver parenchyma and may demonstrate associated fluid collections. Moreover MR pancreatography can be helpful in directing ERCP-guided therapy when ductal anomalies are present, such as pancreas divisum which was present in our patient.

We have also benefit from MRCP and ERPC techniques in late postoperative complications of distal pancreatography where we were able to replace stent drainage to prevent pancreatic fluid leakage.

The degree of blunt pancreatic injury may be classified with the scheme developed by Moore et al.[15] as follows : grade A, pancreatitis or superficial laceration (50% pancreatic thickness); grade B1, deep laceration (50% pancreatic thickness) of the pancreatic tail ; grade B2, transection of the pancreatic tail; grade C1, deep laceration of the pancreatic head; and grade C2, transection of the pancreatic head. Guided by these classification guidelines, treatment may vary from simple drainage to performing Whipple's procedure. The grade of pancreatic injury consists of an independent predictor of both pancreatic complications and mortality [16]. We have performed a distal pancreatectomy in our patient with a diagnosis of a grade C2 injury. The incidence of distal pancreatectomy is reported to be 46% among pancreatic injury related cases in a series reported by Cogbill et al.[17]

Among cases treated surgically for pancreatic trauma, 20-40% will present complications [1]. In the short term, sepsis and multiple organ failure cause 30% of deaths after pancreatic trauma. After surgical treatment, secondary hemorrhage can originate from the pancreatic bed or the surrounding vessels as a result of retroperitoneal auto digestion. The formation of pancreatic fistulas is common. The incidence of abscess formation postoperatively as seen in our patient ranges from 10 to 25%. We have also encountered pancreatic fluid leakage even after re-laparotomy of the patient and fortunately were able to treat it with minimal invasive technique of ERCP guided stent placement before severe pancreatitis occurs. Mild pancreatitis may be anticipated in up to 18% of people who have undergone surgery for pancreatic trauma [17]. Endocrine and exocrine insufficiencies are very unusual after resection for pancreatic trauma. In the long term, pseudocyst formation can present weeks or months after the original injury.

Conclusion

Pancreatic injuries due to blunt trauma are uncommon but serious injuries that require early diagnosis to minimize complications and mortality. Therefore clinicians must be alert in multiple abdominal injuries and should always consider an associated pancreatic injury before or during laparotomy operations. . Any abdominal trauma patient suspicious of pancreatic injury due to USG or CT examination should promptly undergo MR cholangiopancreatography and/or ERCP should be performed for early diagnosis and prompt surgical intervention.

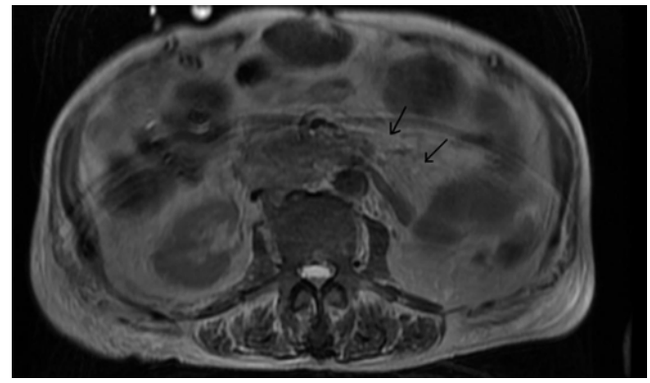


Figure 1. T2 weighted axial MR image shows full transection of the pancreas at the body with a fluid collection.

Competing interests

The authors declare that they have no competing interests.

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