

CASE REPORT

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Complete traumatic main pancreatic duct disruption treated endoscopically: a case report

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Abstract

Introduction: Pancreatic injury is uncommon and the management remains controversial. The integrity of the main pancreatic duct is considered the most important determinant for prognosis.

Case presentation: A 19-year-old Greek man was referred to our tertiary referral centre due to blunt abdominal trauma and an associated grade III pancreatic injury. He was haemodynamically stable and his initial treatment was conservative. Due to deterioration in his clinical symptomatology he underwent an endoscopy 20 days postinjury, where a stent was placed in the proximal pancreatic duct remnant and a bulging fluid collection of the lesser sac was drained transgastrically. He made an uneventful recovery and remains well 7 months postinjury, but a stricture with upstream dilatation of his main pancreatic duct has developed.

Conclusions: The clinical status of the patient rather than the grade of pancreatic injury should be the principal determinant to guide treatment. Endoscopic stenting and drainage is an attractive minimally invasive procedure and it may obviate the need for surgery. However, further investigation is required regarding the safety and outcome.

Keywords: Endoscopic treatment, Pancreatic duct disruption, Pancreatic trauma

Introduction

Non-operative treatment of abdominal injuries has become the standard of care in haemodynamically stable patients with blunt abdominal trauma due to advances in intensive care management and non-operative treatment options. Pancreatic injury occurs in approximately 5% of patients with blunt abdominal trauma and is associated with a mortality of up to 30% and a morbidity of up to 45%. The integrity of the main pancreatic duct (MPD) is the most important determinant of prognosis in these patients, with disruption to the MPD an indication for laparotomy [1-4].

The present case report describes a patient with complete MPD disruption, who was treated non-operatively by endoscopic means.

Case presentation

A 19-year-old Greek man was referred to our tertiary referral centre, from a district hospital, due to blunt abdominal

trauma with an associated pancreatic injury, 5 days ago. The mechanism of injury was a blow into his epigastrium during an assault.

He was haemodynamically stable and clinically there was mild tenderness in his epigastrium without any signs of peritonism. Laboratory tests showed a mild increase in serum amylase (670U/L, reference values 25 to 125) and C-reactive protein (9.1, reference values 0 to 0.5).

An abdominal computed tomography (CT) scan documented the injury with a full thickness laceration of his pancreatic neck and an associated 6×2cm fluid collection in this lesser sac with a minimal amount of free fluid in the rest of his peritoneal cavity (Figure 1). Magnetic resonance cholangiopancreatography (MRCP) showed a complete MPD disruption at the level of the neck (Figure 2). He was treated conservatively with fasting, total parenteral nutrition and octreotide. During observation and on the 16th postinjury day, he became pyrexial with an increase in his white cell count and amylase level. A repeat CT scan showed enlargement of the fluid collection. Because he remained haemodynamically stable with no signs of peritonism, it was decided to undergo an endoscopic retrograde cholangiopancreatography (ERCP) with possible

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Figure 1 Contrast-enhanced computed tomography of the abdomen reveals a full thickness laceration of the pancreatic neck (arrow) with a lesser sac fluid collection (not shown), suggesting pancreatic duct disruption.

stenting of the MPD or internal drainage of the fluid collection. The decision was based on persisting fever and enlargement of the fluid collection despite the already mentioned treatment and antibiotics.

An ERCP, performed 20 days postinjury, showed a complete pancreas divisum and cannulation from the minor papilla showed a complete MPD transection with extravasation of contrast (Figure 3). The MPD could not be bridged with a guidewire. A pancreatic pigtail stent (Cook Medical) was placed in the proximal MPD to facilitate drainage of the proximal pancreas to his duodenum. The collection of the lesser sac was bulging into the posterior wall of his stomach and a transmural drainage was

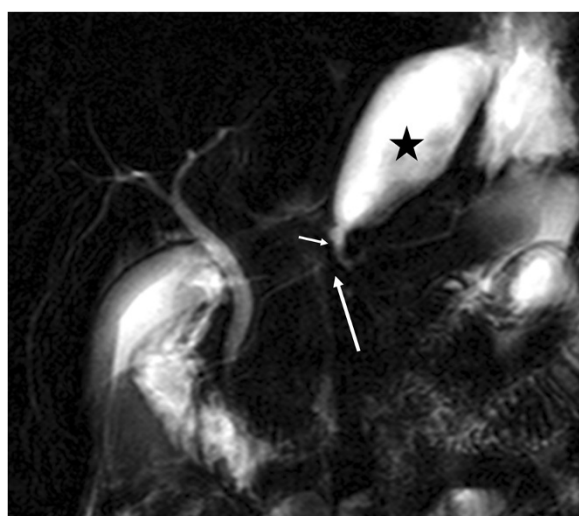


Figure 2 Magnetic resonance cholangiopancreatography shows complete disruption of the pancreatic duct (long arrow). A communication (short arrow) between the duct upstream of the disruption and a fluid collection (asterisk) is also clearly demonstrated.

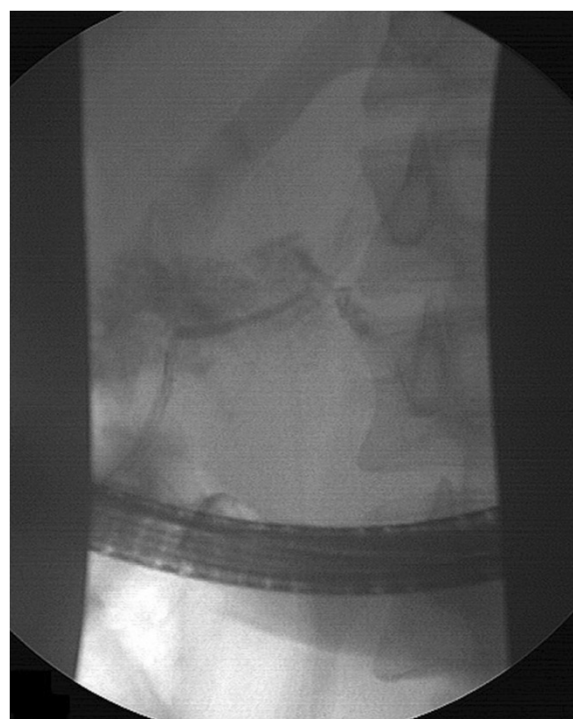


Figure 3 Cannulation from the minor papilla shows complete transection of the main pancreatic duct with extravasation of contrast and no opacification of the distal pancreatic duct.

performed with simultaneous placement of two 7 Fr, 4cm double pigtail stents (Cook Medical; Figure 4). Postoperatively the patient had an elevation of amylase without deterioration of clinical signs. He gradually became asymptomatic and follow-up with sequential ultrasonograms showed resolution of the fluid collection. The pancreatic stent was removed a month later. At 3 months he was admitted for removal of the transgastric stents, but an abdominal X-ray showed that the stents had passed spontaneously. A new MRCP, at 6 months postinjury, showed complete disruption of the MPD with dilatation of the distal remnant (Figure 5). He remains asymptomatic, without steatorrhea or diabetes, with normal amylase levels 7 months postinjury.

Discussion

The pancreas, located in a relatively protected area of the abdominal cavity, is infrequently injured in typical blunt injuries. In a blunt trauma-induced pancreatic injury, fracture over the spinal column is usually observed. Isolated pancreatic injury can cause minimal symptoms early in the postinjury period and can be even silent in many cases [5,6]. The mechanism of injury should focus the clinician on the possibility of pancreatic injury.

Abdominal CT provides the best overall method for diagnosis and recognition of a pancreatic injury [7]. In

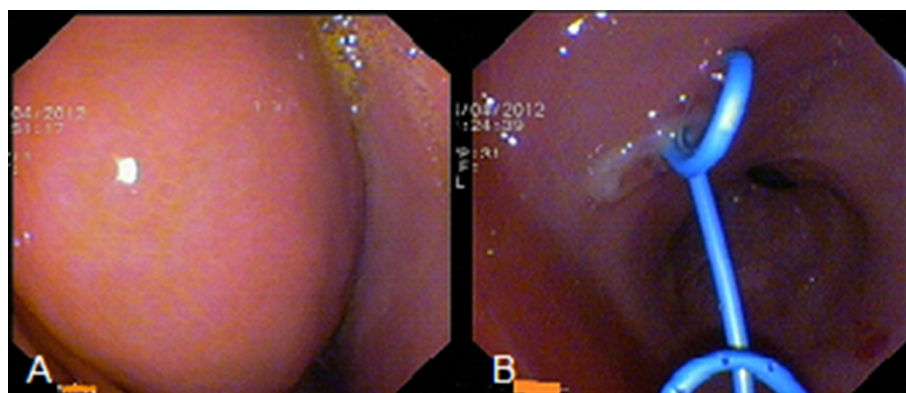


Figure 4 Endoscopic view. A. The bulging at the posterior wall of the stomach due to the fluid collection in the lesser sac. B. Two double pigtail stents were placed transgastrically to drain the fluid collection.

cases in which the CT findings are inconclusive, further investigation with MRCP may be used. MRCP can demonstrate clear delineation of the MPD and its integrity [8].

Pancreatic injuries are classified into five grades according to the Pancreas Injury Scale published in 1990 by the American Association for the Surgery of Trauma [9]. Traditionally, patients with injuries to the MPD (grade III, IV, V) require laparotomy.

In our case a contusion and laceration of the pancreatic parenchyma was found on CT imaging. The integrity of the pancreatic duct could not be assessed by CT and MRCP was performed when the patient was transferred to our hospital, on the 6th day. He was

haemodynamically stable with mild epigastric tenderness and, despite having a grade III injury, it was decided to treat it conservatively initially with the option of endoscopic intervention if required.

In general, injuries accompanied by MPD disruption require more aggressive treatments such as laparotomy or therapeutic endoscopy [10]. Huckfeldt *et al.* [11] reported the first successful stent placement when the procedure was performed a few hours after pancreatic trauma for MPD transection. Endoscopic transpapillary stenting of the MPD promotes healing of duct disruptions by blocking the leaking duct and bridging the disruption or by ablating the pancreatic sphincter converting the high-pressure pancreatic duct system to a low-pressure system with preferential flow to the duodenum [12,4]. Endoscopic transgastric drainage has been established for the treatment of peripancreatic fluid collections and pseudocysts after acute or chronic pancreatitis [13]. Therapeutic endoscopy has been used to treat duct disruptions in the early phase after pancreatic trauma or in the delayed phase to treat complications of duct injury [14,4]. However the published experience is limited.

Our patient had a full recovery and remains asymptomatic, but a duct stricture suggesting complete MPD disruption with upstream dilatation of the pancreatic duct has developed. According to the previous and recent imaging, ERCP to bridge the two MPD sections was considered impossible. Whether this can cause problems in the future is unknown.

Conclusions

The clinical status of the patient rather than the grade of pancreatic injury should be the principal determinant to guide the diagnostic and therapeutic decisions. Endoscopic stenting and drainage is an attractive minimally invasive therapeutic procedure for haemodynamically

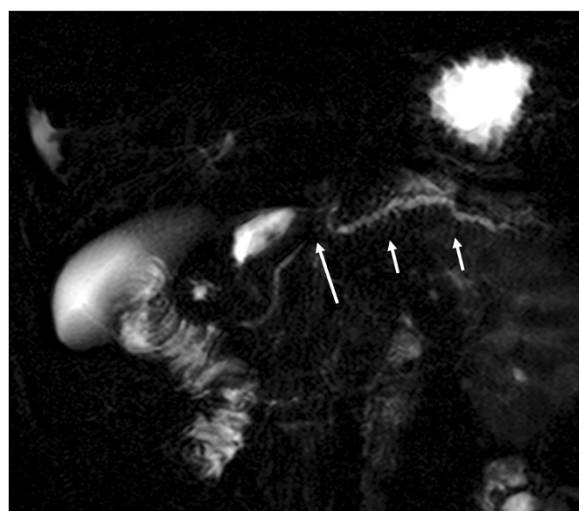


Figure 5 Follow-up magnetic resonance cholangiopancreatography performed 6 months postinjury. A stricture suggesting complete disruption has developed (long arrow), with upstream dilatation of the main duct and its side branches (short arrows).

stable patients, and it may obviate the need for surgery. However, worldwide experience is limited and further investigation is required regarding the safety and outcome.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Abbreviations

CT: Computed tomography; ERCP: Endoscopic retrograde cholangiopancreatography; MPD: Main pancreatic duct; MRCP: Magnetic resonance cholangiopancreatography.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

AV and VK designed the report; AV and GF were attending doctors for the patient; AV and AP performed the endoscopic procedure; GF and GP organized the report; AV and VK wrote the paper and GP and AP gave the final approval. All authors read and approved the final manuscript.

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