

CASE REPORT

Endoscopic Management of Pancreatic Duct Disruption Following a Bullet Injury: A Case Report

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ABSTRACT

Context A pancreatic fistula is the most common complication of pancreatic injury. Although spontaneous closure of pancreatic ductal disruption has been reported, surgical treatment is accepted as the single most carried-out intervention in major ductal injury. We report a case of pancreatic duct disruption due to a bullet injury managed successfully by endoscopic pancreatic duct stenting. **Case report** A 28-year old male sustained a bullet injury leading to proximal pancreatic duct disruption with leakage of dye. After a month of unsuccessful conservative management, graded endoscopic pancreatic duct stenting was carried out, leading to closure of the leak. The patient has gained 15 kilograms of weight at one year of follow-up without any complications. **Conclusion** This is probably the first case of successful endoscopic management of pancreatic duct disruption due to a bullet injury. In carefully selected patients, successful non-surgical management of traumatic pancreatic duct disruption is feasible.

INTRODUCTION

Injuries to the pancreas are rare and account for 1-4% of severe abdominal injuries [1]. In 60-80% of patients with pancreatic injuries, damage to surrounding organs also occurs [2]. A pancreatic fistula is the most common complication of pancreatic injury [3]. Although spontaneous closure of pancreatic ductal disruption has been reported, surgical treatment is accepted as the single most carried-out intervention in major ductal injury. Surgical options include internal or external drainage of fluid collections and pancreatic surgery but surgery has considerable morbidity and mortality. Successful treatment of pancreatic duct disruption due to blunt trauma abdomen by means of endoscopic pancreatic duct stenting has been reported. We report a case of pancreatic duct disruption due to a bullet injury managed successfully by endoscopic pancreatic duct stenting.

CASE REPORT

A 28-year-old male sustained a gunshot injury piercing the liver, pylorus, inferior vena cava and the head of

the pancreas with the bullet lodging between the L2-L3 vertebrae. He went into hypovolemic shock. Resuscitation with exploratory laparotomy (repair of the liver, inferior vena cava and pylorus) was carried out at a local hospital. A percutaneous drain was placed in the pancreatic bed. Postoperatively, the patient developed continued high drain output (500-1,000 mL/day) with a high amylase content (39,640 U/L). Conservative management in the form of bowel rest, total parenteral nutrition and octreotide failed to close the pancreatic fistula. He was thereafter referred to us for further management.

Contrast-enhanced computed tomography (CECT) of the abdomen showed pancreatic injury involving the head, neck and uncinate process with intra-abdominal loculated collections along the right pararenal space, paracolic gutter and pelvis. A percutaneous drain was placed in the loculated collections. A pus culture showed *E. coli*, and antibiotics were given according to the sensitivity report (Figure 1).

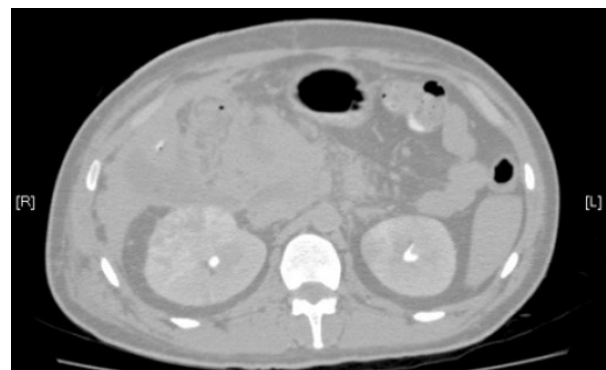


Figure 1. CECT of the abdomen showing acute pancreatic injury.

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Key words Abdominal Injuries; Endoscopy; Pancreatic Fistula

Abbreviations CECT: contrast-enhanced computed tomography; ERCP: endoscopic retrograde cholangiopancreatography; Fr-French

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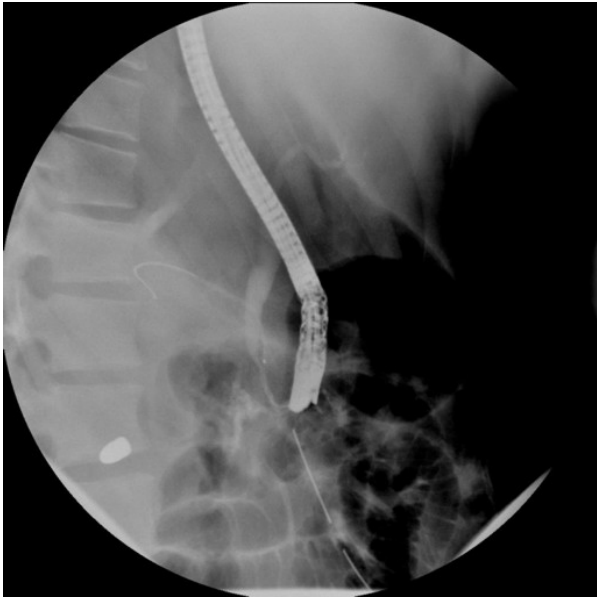


Figure 2. Pancreatogram demonstrating pancreatic duct leak.

Drain output did not decrease despite one month of conservative management. Endoscopic retrograde cholangiopancreatography (ERCP) was carried out one month after the injury. A pancreatogram showed proximal pancreatic duct disruption (type IIIb injury) [4] with leakage of dye but a normal distal duct (Figure 2).

A 5 French (Fr) 7 cm plastic stent was placed across the leak site. Following stenting, the pancreatic bed drain output decreased and the drain was removed 15 days after stenting. Repeat ERCP with pancreatic duct stent exchange with a 7 Fr 7 cm plastic stent was carried out one month after the initial ERCP (Figure 3). A third ERCP with stent removal and pancreatic sphincterotomy was carried out 90 days after the first ERCP. The pancreatogram did not show leakage of the dye implying successful closure of the pancreatic ductal disruption (Figure 4). The patient has gained 15 kilograms of weight at one year of follow-up without any complications.

DISCUSSION

The majority of pancreatic injuries occur in young men. Blunt trauma can lead to transection of the gland in the neck region in line with the superior mesenteric vein due to compression against the lumbar vertebra. Penetrating trauma to the abdomen or lower thorax can lead to pancreatic injury. Rupture of the gland carries a mortality of 20% [5]. In abdominal gunshot injuries, the mortality rate rises according to the number of organs injured [6].

Early diagnosis and adequate therapy for pancreatic trauma are essential for the prevention of complications. A preoperative diagnosis of pancreatic trauma is difficult, as retroperitoneal lesions do not have specific symptoms. Elevation of serum amylase is not a specific sign of pancreatic injury. Enzyme levels increase in only 60-70% of patients with blunt



Figure 3. Pancreatogram demonstrating stent in situ.

abdominal trauma, and in an even smaller proportion in penetrating injuries. On the contrary, elevated amylase levels are present in one third of abdominal trauma patients without pancreatic injury [7].

A number of complications can be associated with pancreatic injury, the most common being pancreatic duct disruption [8, 9]. CECT of the abdomen can detect parenchymal lesions but ductal disruption is commonly missed [10]. However, recent articles in the literature suggest that CT has a 90% sensitivity for detecting pancreatic ductal disruption [11]. Gougeon *et al.* [12] first reported the use of emergency ERCP in the diagnosis of pancreatic injury in 1976. ERCP has a sensitivity and specificity of 100% for pancreatic ductal injury [13]. It can be used preoperatively, intraoperatively and postoperatively in patients with

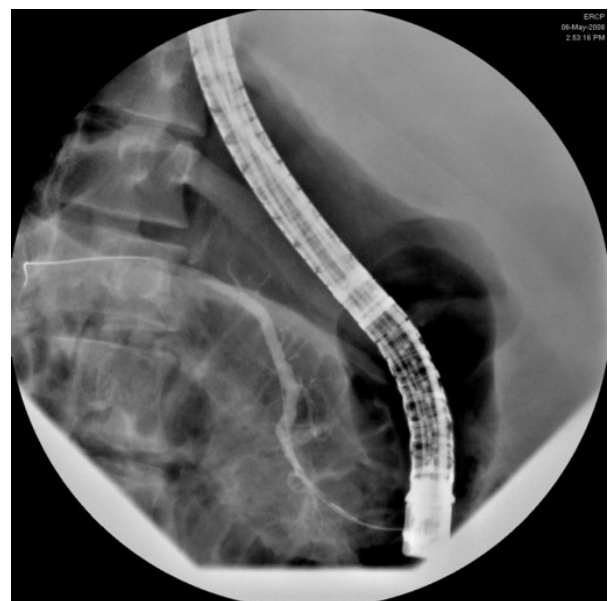


Figure 4. Pancreatogram after stent removal showing no leak.

pancreatic ductal injury. ERCP should be carried out whenever main pancreatic duct injury is suspected. It provides not only a conclusive diagnosis, but also an effective and safe non-operative treatment tool [14]. However, ERCP requires a stable patient and a skilled endoscopist, and has its own complications.

The management of a post-traumatic pancreatic fistula is controversial. Most authorities feel that pancreatic fistulas should be managed conservatively as the majority close within a month [15] and operative management should be reserved for the failure of conservative management, peritonitis and associated duodenal injury. However, significant morbidity and mortality are associated with operative management. Some case series have shown pancreatic duct stent placement to be an effective therapy in resolving duct disruption and its sequel following blunt abdominal trauma [16, 17, 18, 19]. Transductal pancreatic stenting allows internal drainage of the pancreatic secretion and may re-establish duct continuity, although a proportion still requires percutaneous or endoscopic drainage. Endoscopic management has gained increasing acceptance over the past decade. This approach has been extended to patients with main pancreatic duct injury, previously considered candidates for operative management.

In our case, we waited for one month after the injury to allow for the spontaneous closure of the pancreatic fistula using conservative management. After one month, ERCP showed a proximal pancreatic ductal leak which was managed with graded pancreatic duct stenting. Following the first stenting, the pancreatic bed drain output decreased and could be removed. Stent exchange and finally stent removal after documenting ductal leak closure was carried out to prevent the formation of a pancreatic duct stricture leading to chronic pancreatitis. Although endoscopic management of blunt traumatic pancreatic duct disruption has been described in the literature, this is probably the first instance of successful endoscopic management of pancreatic duct disruption due to a bullet injury implying that ERCP has a role in management of such cases. However, the prerequisites are a stable patient and a skilled endoscopist.

Conflict of interest The authors have no potential conflicts of interest

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