Endoscopic Retrograde Cholangiopancreatography in the Management of Traumatic Pancreatic Pseudocysts

A Report of 2 Cases

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SUMMARY

The results of endoscopic retrograde cholangiopancreatography (ERCP) in 2 patients with traumatic pancreatic pseudocysts are described. As a pre-operative procedure, this investigation provided useful information on the exact site of duct disruption. In both patients, the pancreatic pseudocysts were drained via a posterior cyst gastrostomy, and they have remained well since surgery. Follow-up ERCP at 6 and 12 months demonstrated complete stenosis at the site of duct disruption. The value of ERCP in the pre-operative and follow-up management of traumatic pancreatic pseudocysts is discussed.


Blunt injury to the pancreas is uncommon and should be suspected in any patient with a history of forcible compression of the upper abdomen. This may occur as a result of kicks and punches in fights, steering wheel and seat-belt injuries in motor accidents, and falls on the handlebars of bicycles and tricycles in children.

Pseudocyst formation is a common complication of pancreatic injury. Indeed, pancreatic injury is often not suspected until a pseudocyst develops a few weeks or months later. The diagnosis is dependent on the presence of a tender abdominal mass, with abnormal elevation of the serum amylase level, and leucocytosis. Further diagnostic help may be obtained by barium meal investigation, abdominal ultrasound examination, and, in some cases, by arteriography.

The treatment of choice of traumatic pancreatic pseudocysts is surgical, viz. internal drainage, or pancreatic resection. The pre-operative demonstration of the exact site of the pancreatic duct disruption would provide useful additional information for the selection of the appropriate surgical therapy. Before the introduction of endoscopic retrograde cholangiopancreatography (ERCP), this was only possible by means of intra-operative cholangiography.

In this report the utilization of ERCP in the pre-operative diagnosis, and the follow-up management of 2 patients with pancreatic pseudocyst formation after abdominal trauma are described.
CASE REPORTS

Case 1

A 30-year-old man presented in January 1976 with a history of having sustained a steering wheel injury to his abdomen in a motor vehicle accident 3 weeks before admission. He subsequently complained of continuous cramp-like epigastric pain aggravated by meals and associated with vomiting, anorexia and weight loss. There was a large, tender epigastric mass, and a barium meal examination showed gross anterolateral displacement of the stomach (Fig. 1). Laboratory evaluation revealed a haemoglobin level of 14.7 g/dl and a white cell count of 3,700/μl. The serum amylase was 180 Street-Close U/l (normal 8 - 38 U/l).

Fig. 1. Barium meal radiograph showing lateral displacement of the stomach by a large pancreatic pseudocyst (case 1).

The clinical diagnosis was a traumatic pancreatic pseudocyst. The patient underwent ERCP examination before surgery, and this demonstrated a large pseudocyst in the head of the pancreas, with the site of duct disruption at the junction of the head and neck (Fig. 2). Laparotomy confirmed the presence of a large pancreatic pseudocyst which was drained of 2 litres of fluid via a posterior cyst gastrostomy. The patient made an uneventful recovery and was discharged.

He remained well until February 1977, when he complained of continuous epigastric pain radiating to the left hypochondrium and to the back. His alcohol consumption was negligible. There was slight abdominal tenderness localized to the left hypochondrium, but the rest of the examination was non-contributory. The serum amylase level was normal. A repeat ERCP (Fig. 3) was performed, which, in comparison with the initial ERCP (Fig. 2), demonstrated restoration in the continuity of the duct at the site of the previous disruption, but with a complete cut-off of the duct evident at a more distal site in the body of the pancreas. In the presence of adequate duct filling with contrast medium, this cut-off, which was constant on all the radiographs, indicated complete stenosis of the pancreatic duct at the distal site. The patient was treated symptomatically, and was asymptomatic at follow-up examination 20 months later.

Case 2

An 18-year-old youth was admitted on 26 January 1977 after having been kicked in the abdomen. There was generalized distension and tenderness of the abdomen, with evidence of peritoneal irritation. The diagnosis of intra-abdominal injury was confirmed at laparotomy, when a ruptured spleen and a large amount of blood were found in the peritoneal cavity. In addition, there was a retroperitoneal haematoma overlying the pancreas. This was left undisturbed and a splenectomy was performed. The postoperative serum amylase level was 324 IU/l. The patient made an uneventful recovery, and was discharged 11 days later.

On 21 February 1977 he presented with epigastric pain and a tender abdominal mass. The serum amylase con-

Fig. 2. ERCP demonstrating site of duct disruption and pseudocyst in head of pancreas (case 1).
centration was 1925 IU/l. A barium meal investigation demonstrated lateral displacement of the stomach by a large pseudocyst of the pancreas (Fig. 4). ERCP performed pre-operatively showed a disruption of the pancreatic duct in the body of the pancreas communicating with a large pseudocyst (Fig. 5). At surgery, a large pancreatic pseudocyst was drained via a posterior cyst gastrostomy.

A repeat ERCP performed 6 months later to demonstrate any distortion in the pancreatic duct architecture showed complete stenosis of the duct at the site of the previous disruption (Fig. 6). At follow-up examination 14 months later, the patient was well and had no abdominal pain.

DISCUSSION

The infrequent occurrence of injuries to the pancreas can be accounted for by its high retroperitoneal position in the abdominal cavity. However, when the pancreas is crushed between the compressing force and the spine, injury which may be confined to the pancreas may result in one-third of cases.\(^1\)

Pancreatic trauma is often unsuspected because the onset of complaints frequently occurs days, weeks or months after the injury. This is more likely to occur in patients with isolated pancreatic injury. Indeed, even in patients with associated injuries requiring laparotomy, the surgeon often neglects to examine the pancreas for evidence of injury. The presence of upper retroperitoneal haematoma should be considered presumptive evidence of pancreatic injury and the pancreas should be carefully explored, and sources of bleeding controlled.\(^5,6\) In addition, one can expect some disruption of ducts or ductules with any pancreatic injury. Wide drainage of the damaged pancreas and retroperitoneal area is therefore advised to prevent the undesirable complications of pseudocysts and abscesses.\(^2,3\) The overall mortality rate in pancreatic injury is 20%.\(^4\)

Pancreatic pseudocyst formation is a frequent complication of pancreatic injury, and has been reported in up to 75% of patients managed conservatively.\(^7\) As far back as 1892, Lloyd\(^1\) emphasized the importance of surgical drainage in traumatic pancreatic pseudocysts. Spontaneous resolution is extremely unlikely, and the secondary complications of spontaneous rupture, infection and massive haemorrhage have such a high mortality that surgical treatment is required. ERCP can offer useful pre-operative diagnostic information which could favourably influence the high morbidity and mortality associated with pancreatic injury. Pancreatic duct disruption with pseudocyst formation in the head and body of the pancreas can be managed in most instances by internal drainage into the stomach or duodenum, while cysts in the tail of the pancreas may be suitable for distal pancreatic resection and a Roux-en-Y jejunal loop.

That both patients did well at intervals of 14 and 20
months after surgery suggests that as a result of the complete stenosis of the pancreatic duct there was most probably distal pancreatic atrophy, or at least a failure of exocrine pancreatic secretion. Experimentally, ligation of the pancreatic duct results in degeneration of the acinar tissue with considerable preservation of the islet tissue. However, up to 90% of the gland must be damaged to produce evidence of pancreatic insufficiency. Therefore, the development of total stricture formation of the pancreatic duct need not cause concern, provided not more than 80% of the gland is involved, and there is no evidence of an underlying exocrine or endocrine pancreatic disorder.

There is little information regarding the long-term effects on the ductal system after pancreatic trauma. In case 1, the restoration in duct continuity at the proximal site suggests partial disruption while, more distally, total stricture formation probably resulted from complete disruption of the duct (Figs 2 and 3). Follow-up ERCP examination is clearly necessary to assess whether the initial trauma has seriously disrupted the ductal system of the gland. This disruption of the duct architecture may provide the basis for future inflammatory attacks and progressive insufficiency of the organ.

The main risk of ERCP in a patient with pancreatic pseudocyst formation is the development of a pancreatic abscess, as a result of the introduction of microorganisms during the procedure. For this reason we routinely add antibiotics to the contrast material, with the additional administration of systemic antibiotics should a pancreatic pseudocyst be demonstrated on ERCP. No untoward complications were encountered in our patients. Thus, with minimal additional risk, ERCP can provide valuable pre-operative information regarding the exact site of duct disruption in pancreatic injury. Furthermore, a follow-up ERCP can ascertain the extent of injury to the main duct system.

REFERENCES