Pancreatic Trauma with Splenic Preservation
(A Case Report)

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ABSTRACT

Trauma to the pancreas is rare, occurring in 0.2 to 3% of abdominal injuries. They are associated with high mortality and morbidity if diagnosis is delayed. Their clinical symptomatology is atypical. Abdominal CT scans can diagnose pancreatic injury and rupture of the main pancreatic duct. It is important that surgeons are aware of the issues and principles of management of pancreatic injury.

We report the case of a 33-year-old patient with no previous pathological history. Admitted for a closed abdominal contusion following a road traffic accident with an abdominal impact point without initial loss of consciousness and generalized abdominal contracture. Abdominal CT scan showed a hypodense area in the tail of the pancreas not enhanced after contrast injection, possibly related to a pancreatic fracture and a medium-sized peritoneal effusion. The patient underwent corporeo-caudal pancreatectomy with splenic preservation. Postoperative follow-up was favorable. The clinical evolution judged on regular controls was favorable over a period of 2 years.

We would like to share a very difficult clinical case and our experience with the support of the literature. This is a challenge to clinicians and surgeons above all.

Keywords: Pancreatectomy, pancreatic trauma, therapeutic strategies, treatment.

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I. INTRODUCTION

The pancreas is a retroperitoneal organ, whose anatomical relationship with vascular and digestive structures is complex [1]. Pancreatic trauma is uncommon, affecting 0.5%–8% of trauma patients [2]. These injuries are difficult to diagnose and pose a problem in treatment strategy [1]. Treatment can be solely medical, but mainly surgical and endoscopic in the case of ductal damage [3]. It is important that surgeons are aware of the challenges and management principles of the pancreatic injury [4].

We report the case of a 33-year-old patient with no previous pathological history. Admitted for a closed abdominal contusion following a road traffic accident with an abdominal impact point without initial loss of consciousness and generalized abdominal contracture. Abdominal CT scan showed a hypodense area in the tail of the pancreas not enhanced after contrast injection, possibly related to a pancreatic fracture and a medium-sized peritoneal effusion. The patient underwent corporo-caudal pancreatectomy with splenic preservation. Postoperative follow-up was favorable. The clinical evolution judged on regular controls was favorable over a period of 2 years.

II. CASE DESCRIPTION

The patient was 33 years old and had no previous medical history. Admitted to the department for a closed abdominal contusion following a public road accident (PRA) with thoraco-abdominal impact without initial loss of consciousness or other associated signs.

On general examination, the Status of performance was zero with a temperature of 38 °C and the abdominal examination found a generalized abdominal contracture.

In the paraclinical work-up, abdominal ultrasound showed only a small to medium-sized peritoneal effusion. An abdominal CT scan (Fig. 1) was then completed, which showed a hypodense area in the tail of the pancreas that was not enhanced after injection of PDC, which could be related to a pancreatic fracture and a moderate peritoneal effusion. The hemoglobin was 14.9 g/dl, the white blood cell count was 11100/mm³ and the C-reactive protein (CRP) was 131 mg/l.

The patient underwent corporo-caudal pancreatectomy with splenic preservation, peritoneal cleansing with dirty saline, drainage of the pancreatic stump by delbet blade, drainage of the back cavity of the epiploons by redon drain, subphrenic drainage by redon drain, drainage of the pouch of Douglas by redon drain and a feeding jejunostomy. On exploration, there was a medium-sized peritoneal effusion of "collected" serum fluid, the presence of candle spots throughout the abdominal cavity, the presence of a fracture of the body of the pancreas (Fig. 2) with a solution of continuity of the Wirsung canal with the presence of a laceration of the tail of the pancreas and the presence of necrosis flows in retroperitoneal behind (image B) the ADJ with conservation of the splenic vessels (Fig. 3).

The postoperative evolution was favorable and the patient was declared discharged at D-10 postoperatively after removal of the drains and the delbet blade.

The clinical evolution judged on regular controls is favorable after 2 years.

III. DISCUSSION

Trauma to the pancreas is rare and frequently associated with other intra-abdominal or extra-abdominal injuries as part of a major trauma [3].

The frequency of pancreatic trauma is 0.25 cases per 100,000 population in the Nilsson study. In the series on abdominal trauma, pancreatic involvement is rare, between 1 and 6% of cases in adults and less than 1% of trauma admissions in children. These circumstances of occurrence explain the strong male predominance in all the series, and the young age of the injured, with 80% of the trauma victims being under 40 years old [5].
Morbidity and mortality rates for isolated pancreatic injuries are related to the presence of pancreatic duct damage [6].

Patients with isolated pancreatic trauma are asymptomatic in the first few hours but later develop diffuse abdominal pain with an epigastric origin [7]. When the pancreatic lesion is small, the pain may disappear rapidly and only reappear with the appearance of a pseudocyst [3]. In the case of polytrauma, the symptoms may be masked or difficult to differentiate [8].

The diagnosis of pancreatic trauma is based on a combination of clinical, biological, and radiological examination [9].

Abdominal CT with contrast injection plays an important role in the hemodynamically stable patient presenting with abdominal trauma as it provides comprehensive information for the diagnosis of pancreatic trauma [10]. In the initial stage, the images suggestive of pancreatic injury are usually non-specific. More specific signs are enlargement of the gland, presence of a hypodense pancreatic fracture, a spontaneously hyperdense hematoma, better individualized after injection, the presence of fluid between the splenic vein and the posterior aspect of the pancreas, and infiltration of the peri-pancreatic fat and/or the anterior para-renal fascia [3].

Although ultrasound is easy to perform, its use is limited and it is useful for monitoring complications [10].

Endoscopic retrograde cholangiopancreatography (ERCP) provides complete ductal mapping, with 100% sensitivity for detecting abnormalities. It should be performed within the first 12 to 24 hours after the trauma [3].

The contribution of magnetic resonance imaging (MRI) to parenchymal exploration does not seem to be greater than that of CT [3].

Therapeutic decisions are very difficult depending on whether an emergency laparotomy is necessary or whether a closed belly work-up is allowed by a stable or stabilized hemodynamic situation. They are also based on the involvement of the Wirsung and the anatomical classification of the Lucas lesions expresses these data well (Table I) [11].

| Class | Modified Lucas Classification |
|-------|------------------------------|
| Class I | Contusion or laceration with minimal parenchymal damage. Main pancreatic duct intact. |
| Class II | Major laceration, perforation or transection of body or tail with or without duct injury. |
| Class III | Severe crush, perforation or transection of the pancreatic head with or without duct injury. |
| Class IV | Combined pancreatic-duodenal injury: |
| a) | Minor pancreatic injury |
| b) | Severe pancreatic injury with duct disruption |

Classification of traumatic injury of the pancreas according to the AAST [1]:

- Grade 1: Minor contusion without ductal injury.
- Grade 2: Major contusion/laceration without ductal injury or tissue loss.
- Grade 3: Distal transection or parenchymal injury with ductal injury.
- Grade 4: Proximal transection or parenchymal injury involving ampulla.
- Grade 5: Mass destruction of the pancreatic head.

In open belly treatment, two different situations can be contrasted, one in which the trauma to the pancreas is only one of the elements of a serious picture imposing a damage control laparotomy, and the other in which the control of the situation allows a complete exploration of the pancreas and opens up the choice of treatment procedures (Fig. 4) [12].

![Fig. 4. Decisional algorithm: management steps when pancreatic injury is found at open laparotomy. PD: pancreatoduodenectomy, CT: computed tomography scan, MRI: magnetic resonance imaging, ERCP: endoscopic retrograde cholangiopancreatography.](image)

In the case of closed belly treatment in the absence of ductal injury (Lucas class I), careful monitoring is proposed in the surgical setting. If ductal damage is likely, the use of an endocanal prosthesis has given excellent results. On the other hand, in the case of ductal damage with doubt about an associated duodenal lesion, an exploratory laparotomy is indicated [11].

Pancreatic-related complications are reported to occur in 11-62% of patients after pancreatic injury trauma, with an average morbidity rate of 36.6% [13].

In case of late diagnosis, post-traumatic complications of the pancreas are acute pancreatitis, pancreatic pseudocysts. Other rare complications are false aneurysms, portal thrombosis and duodenal stenosis [12].

IV. CONCLUSION

Pancreatic trauma is always a challenge for surgeons. It is important to make an early diagnosis which is key to the success of the patient. There are different treatment modalities available, but a lot of controversies exist in the management. And despite scientific advances, the prognosis is still poor.

PATIENT CONSENT

Written informed consent for publication of their clinical details and clinical images was obtained from the patient.

AUTHOR CONTRIBUTION

Ahmed Elmi Abdirahim: corresponding author writing the paper; El Bakouri Abdellah: writing the paper; Mounir Bouali: study concept; Bensardi Fatima-Zahra: correction of
the paper; El hattabi Khalid: correction of the paper; Fadil Abdelaziz: correction of the paper.

**ETHICAL APPROVAL**
As per international standard or university standard written ethical approval has been collected and preserved by the author.

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**CONFLICT OF INTEREST**
Authors declare that they do not have any conflict of interest.

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