

CASE REPORT

Laparoscopic Spleen-Preserving Distal Pancreatectomy Followed by Intramuscular Autologous Islet Transplantation for Traumatic Pancreatic Transection in a Young Adult

Sabrina Dardenne¹, Adrien Sterkers², Christophe Leroy³, Laurent Da Mata⁴, Philippe Zerbib¹, François-René Pruvot¹, François Pattou², Stéphanie Truant¹

Departments of ¹Digestive Surgery and Transplantation, ²Endocrine Surgery, ³Medical Imaging, and ⁴Anesthesiology; CHU, Univ Nord de France. Lille, France

ABSTRACT

Context Pancreatic injuries caused by blunt trauma are often treated conservatively, except for the highest grades of these. **Case report** We report a case of complete transection of the distal pancreas in a young adult which was successfully managed by spleen-preserving laparoscopic distal pancreatectomy followed by an islet autotransplantation in the patient's forearm striated muscle. **Conclusion** We describe a mini-invasive approach for pancreatectomy with restoration of resected islets to the patient.

INTRODUCTION

Pancreatic injury occurs in 12% of abdominal trauma [1] while the reported incidence in blunt trauma is between 0.2 and 5% [2, 3]. Isolated pancreatic injury in such circumstances is unusual. The benefit of early surgical management has previously been demonstrated for injuries with duct transection [4]. Laparoscopic distal pancreatectomy is a well reported procedure that may provide better postoperative outcome and esthetic result [5]. But only few case-reports or small series describe this approach for pancreatectomy following traumatic injury, and mostly in the pediatric population [4, 6, 7, 8, 9]. We report a case of successful laparoscopic distal pancreatectomy for a complete transection of the left pancreas in a young adult who subsequently benefited from an islet autotransplantation with mini-invasive approach.

CASE REPORT

In the resuscitation room of our centre we received a 24-year-old man without any previous medical history, after a road traffic accident. He fell of his motorcycle with unclear circumstances; he did not remember the

event because of an alcohol abuse. Assessment in emergency room revealed stable hemodynamic signs but a marked tenderness with focalized guarding in the epigastric region. There were diffuse contusions of the thoracic and abdominal wall. The rest of the clinical examination was normal. Laboratory analysis indicated a ten-fold increase of liver enzymes and elevated lipases at 337 U/L (reference range:10-150 U/L). Thoracoabdominal computed tomography (CT) showed a hemoperitoneum, a moderate contusion of the left liver, and a complete fracture between the body and the tail of the pancreas (Grade III) [10] (Figure 1). We performed a laparoscopic exploration the following day. The trocars were placed as following: a supra-umbilical 10 mm port, and three 5 mm ports in the left subcostal region, the right hypochondrium, and below the xyphoid appendix. The abdominal exploration disclosed a minimal hepatic contusion of the left lobe without active bleeding, the absence of associated hollow viscus injury, and a moderate hemoperitoneum. Then, the lesser sac was opened through the gastrocolic ligament, preserving the short gastric vessels, but especially the left gastroepiploic artery, which represents the main collateral vasculature in case of spleen preservation with splenic vessels resection [11, 12]. The pancreas was shown to be transected entirely at the level of its tail, with significant peripancreatic hematoma and inflammation. The splenic vein was identified deep behind the pancreas (Figure 2). We could perform a totally laparoscopic distal pancreatectomy with spleen and splenic vessels preservation. The proximal main pancreatic duct was oversewn with 4-0 Monocryl[®] (Ethicon, Inc.,

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Correspondence Sabrina Dardenne
Secrétariat de Chirurgie Digestive et Transplantation CAOB,
Professeur FR Pruvot; Hôpital Claude Huriez, CHRU de Lille;
F-59037 Lille Cedex; France
Phone: +33-(0)320.444.260; Fax: +33-(0)320.446.364
E-mail: sabrinadardenne@hotmail.com

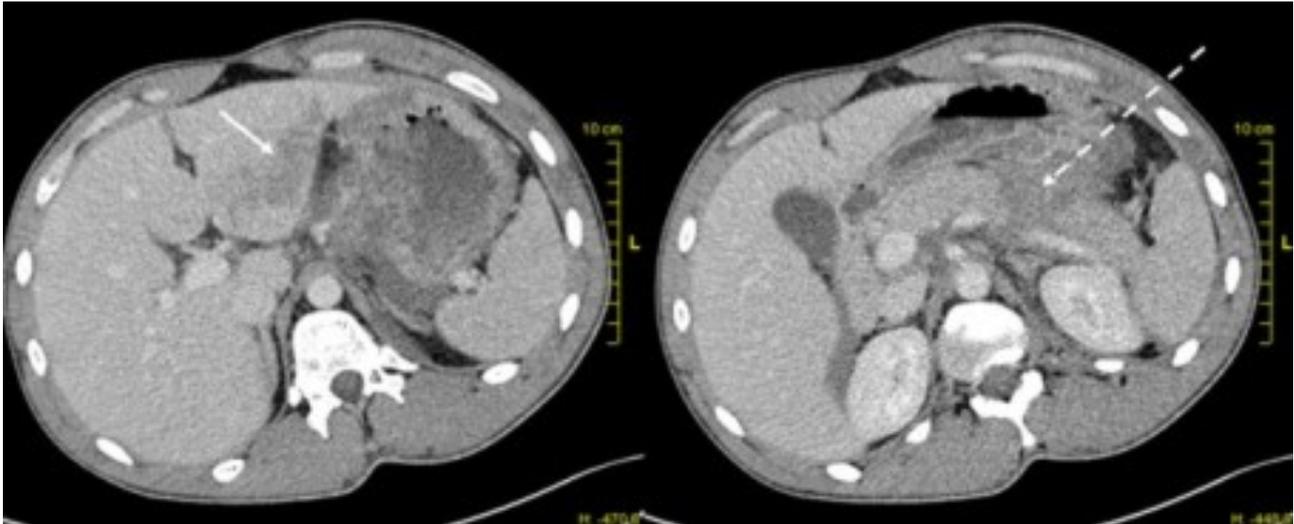


Figure 1. CT scan showing a moderate contusion of the left liver (arrow), and a complete fracture between the body and the tail of the pancreas with an hematoma in front of the splenic vein (dotted arrow).

Somerville, NJ, USA), with no further treatment of the proximal pancreatic margin. We placed a Penrose drain near the head of the pancreas. The resected piece was removed in a bag, by a short Pfannenstiel laparotomy (Figure 3). Indeed, it was necessary not to damage the tail of the pancreas, which was subsequently treated for islets isolation.

One day later, the patient could benefit from an islet autotransplantation in the left forearm under local anesthesia, as previously described in the literature [13, 14, 15]. The early postoperative outcome was uncomplicated, without pancreatic leak. The patient was discharged after nine days.

DISCUSSION

The management of pancreatic trauma largely depends on the presence of duct disruption and other concomitant injuries [6]. Endoscopic retrograde cholangiopancreatography (ERCP) can evaluate the ductal integrity, but we did not perform this exam

because of the rather important suspicion of complete pancreatic transection on CT scan. Grade III involving the distal pancreas and the main pancreatic duct was diagnosed according to the Association for the Surgery of Trauma (AAST) injury scale (grade III to V sign a major injury) [10]. The traditional management approach for major pancreatic trauma at the level of neck, body, and tail is open exploratory laparotomy and distal pancreatectomy [6]. More recently, laparoscopic surgery has been applied in such a context, by analogy with pancreatectomies for other conditions, although mainly reported in the pediatric population [5]. In our 24-year-old patient, we chose laparoscopic approach because we expected a simplified dissection due to the complete transection and the magnified visualization offered by this procedure. However, these advantages could have been counterbalanced by risks relative to local conditions such as surrounding hematoma and inflammation. Furthermore, the treatment of the proximal pancreatic



Figure 2. Operative view with the body of the pancreas (arrow) separated of the tail (thick arrow), and the splenic vein in depth (white arrow).



Figure 3. The tail of the pancreas was removed by a short over pubic laparotomy.

margin may be more difficult by laparoscopic approach. In the literature, the reported complications rate after surgical treatment of pancreatic trauma range between 26 and 86% [6], including pancreatic fistula in 8 to 30% [8]. This rate is similar after open *versus* laparoscopic approach [8]. But laparoscopy provides a shorter hospital length of stay and a faster recovery [4, 6, 8]. Our patient was discharged after nine days. Actually, he roamed in the hospital's corridors waiting impatiently a return to home from the fifth day, but he had to remain for control imaging examinations because of his hepatic contusion. Another important point of the discussion concerning partial

pancreatectomies is after-effects as the onset of diabetes. The real incidence of the postoperative endocrine dysfunction is poorly evaluated in the literature. Some series reported this complication after pancreatectomy for miscellaneous indications [16, 17]. The risk of diabetes after trauma is related to the volume reduction of the gland, and is more frequent after distal pancreatectomy than in other partial resection like central pancreatectomy [18], due to a greater concentration of islets cells in the tail [19]. Al-Ahmadi *et al.* [20] collected data about 25 patients with pancreatic trauma, 6 of 13 operated patients required a distal pancreatectomy and the others 12 were conservatively managed. The overall reported endocrine deficiency was 16% after a five-year follow-up [20]. So, we decided to restore to the patient his islets, which otherwise would have been lost. In the literature an abundance of data is found about islet cell transplantation, but few concerning this procedure in case of traumatic pancreatic injury. Jindal *et al.* [21] reported a case of total pancreatectomy after gunshot wound and Garraway *et al.* [2] two cases of distal pancreatectomy after road crash and stab wound, but they made islet re-implantation in the portal vein, the most common site of injection nowadays. The choice of striated muscle as graft recipient site (successfully tested on rats) provides a less invasive procedure, a probably better engraftment (less islet destruction in the portal circulation), and an easy removal if necessary [22].

CONCLUSION

We described a successful laparoscopic spleen-preserving distal pancreatectomy for abdominal injury with complete pancreatic duct transection. We took a special care of the removed piece to allow it to be restored to the patient in the form of intramuscular autologous islet transplantation.

Competing interest None

Reference

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