

Clinical Cases

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A Case Report of Pancreatic Transection by Blunt Abdominal Trauma

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Rezumat

Transsecțiune pancreatică prin traumatism abdominal închis - prezentare de caz

Ruptura posttraumatică de pancreas este asociată cu o rată mare a morbidității și a mortalității. Sunt descrise variate strategii de management al acestor cazuri, dar din cauză că aceste cazuri sunt rare, nu există tratament standard. Prezentăm cazul unui tânăr de 21 ani cu ruptură post-traumatică completă de istm pancreatic, asociat cu o leziune devascularizantă a duodenului II, tromboză posttraumatică de arteră renală dreaptă și dilacerarea lobului stâng hepatic. Ruptura posttraumatică de pancreas este asociată cu o rată mare a morbidității și a mortalității. Sunt descrise variate strategii de management al acestor cazuri, dar din cauză că aceste cazuri sunt rare, nu există tratament standard. Prezentăm cazul unui tânăr de 21 ani cu ruptură post-traumatică completă de istm pancreatic, asociat cu o leziune devascularizantă a duodenului II, tromboză posttraumatică de arteră renală dreaptă și dilacerarea lobului stâng hepatic. După laparotomie și hemostază în alt spital, pacientul ne-a fost adresat. S-a efectuat duodenopancreatectomie cefalică și nefrectomie dreaptă. Postoperator, pacientul a dezvoltat o fistulă pancreatică ce s-a închis spontan la 45 zile. Duodenopancreatectomia cefalică poate fi o soluție de management a traumei pancreatice în cazuri selecționate.

Cuvinte cheie: transecțiune pancreatică, traumă, duodeno-pancreatectomie, complicații tardive

Abstract

Posttraumatic pancreatic rupture is associated with high morbidity and mortality. Various management strategies are described, but due to the relative rarity of this pathology no standards exist. We reported a 21 years old male with post-traumatic complete rupture of the pancreatic isthmus, devascularization lesion of descending duodenum, right renal artery posttraumatic thrombosis and left lobe of the liver laceration. Laparotomy for hemostasis was initially performed in a different hospital and the patient was then referred to us. Pancreaticoduodenectomy and right nephrectomy were performed. Postoperatively the patient had a pancreaticojejunal anastomosis fistula spontaneously resolved at 45 days. Pancreaticoduodenectomy can in selected cases be a solution in pancreatic trauma.

Key words: pancreatic transection, trauma, pancreaticoduodenectomy, late complications

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Introduction

Although the incidence of pancreaticoduodenal injuries in blunt abdominal trauma is very low, it is also associated with

numerous complications, such as traumatic pancreatitis, duodenal fistula, bile leakage, pancreatic fistula, diffuse peritonitis, abdominal abscess and pancreatic pseudocysts (1). Due to its retroperitoneal location, pancreatic injury from both blunt and penetrating trauma is less common. Pancreatic injury has been reported to occur in only 3 to 12% of patients presenting with abdominal injuries: 1,1% in penetrating traumas and only 0,2% in blunt trauma. Despite the fact that it is a rare condition, traumatic pancreatic rupture is associated with high morbidity and mortality. The diagnosis is difficult, usually accompanied with other injuries and so, the delay in treatment is frequent (2,3). Pancreaticoduodenal injury can result in severe morbidity and even mortality. Pancreaticoduodenectomy is a valid option to save the life of patients with severe pancreaticoduodenal injury (3). The surgeon's assessment is usually accurate, but when doubt exists, intraoperative pancreatography is advocated. In patients with significant pancreatic head injury with ductal disruption and associated duodenal injury, pancreaticoduodenectomy is recommended (4).

Case report

We report the case of a 21 years old patient with blunt abdominal trauma 48 hours before following aggression. The patient underwent laparotomy in another hospital being hemodynamic instable. The exploration showed laceration of liver segments II and III. Haemostatic suture was performed. After hemodynamic stabilisation the patient was referred to our center. At admission the patient was stable biologically, WBC = $11000/\text{mm}^3$, Hb = 9,9 g/dL, Serum amylase = 1200U/L. Chest X-ray: moderate bilateral effusion. CT scan described complete rupture of the pancreatic isthmus, right renal artery thrombosis with secondary ischemic lesions of the right kidney. (Figs. 1, 2).

We decided to perform laparotomy. Intraoperatory, we found an important quantity of ascites of pancreatic origin, complete isthmus pancreatic transection, traumatic lesion with devitalisation of parts II and III of the duodenum. After Kocher maneuver, a bile collection was identified in the retroperitoneum. The right kidney showed devitalisation at palpatory maneuvers, consistant with the CT description of right renal artery thrombosis. We performed cephalic pancreaticoduodenectomy and right nephrectomy (Figs. 3, 4). The post-operative evolution was marked by the apparition of an external pancreatic leakage in the 6th day with an average flow of 300 ml /24 hours which progressively diminished under conservative treatment. The patient was discharged the 19th postoperatively day and the drainage tube was removed the 45th postoperatively day. The control ultrasound exam was normal.

Discussions

Pancreatic injury in blunt abdominal trauma is rare; it is generally associated with multivisceral injury. A variety of operative interventions for pancreatic lesions are available to the surgeon, the difficult part being the best choice and the integration of pancreatic posttraumatic surgery in the damage control concept which would insure the best outcome for a given patient. Lesions of pancreas could be divided into 2 major groups: the ones that respect the integrity of the main pancreatic duct and a group with disruption either total or partial of the duct. In the former group nonoperative management appears to be the best choice, bearing in mind late intervention on demand if necessary. In cases with partial effraction of the main pancreatic duct (MPD), drainage (either operatively or by endoscopic stenting) appears to be the choice for best outcome with mild nonaggressive therapeutic approach. The later group of patients of MPD disruption (following blunt

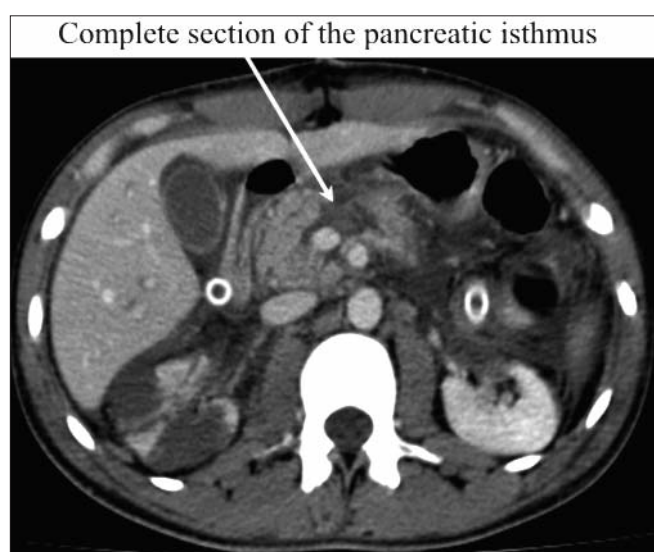


Figure 1.

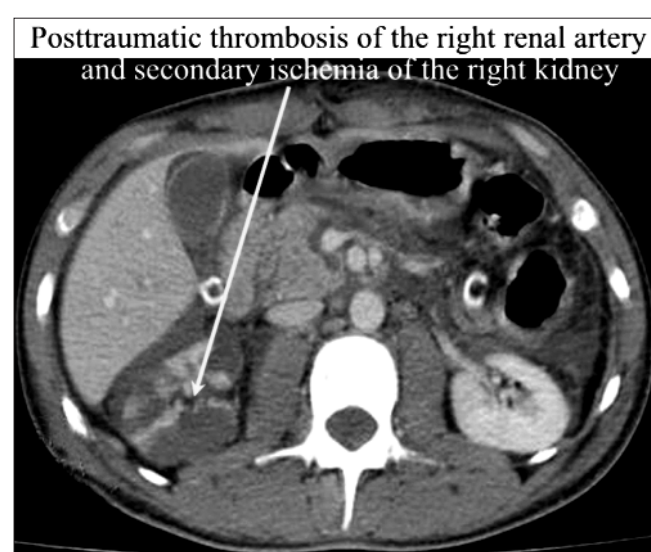


Figure 2.

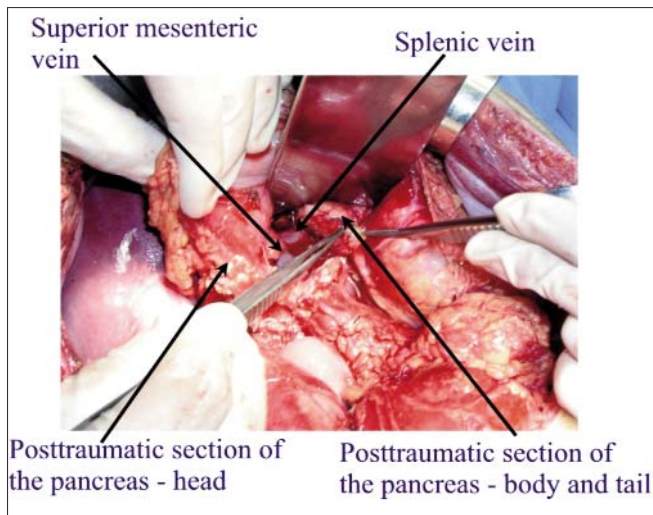


Figure 3. Complete transection of the pancreatic isthmus

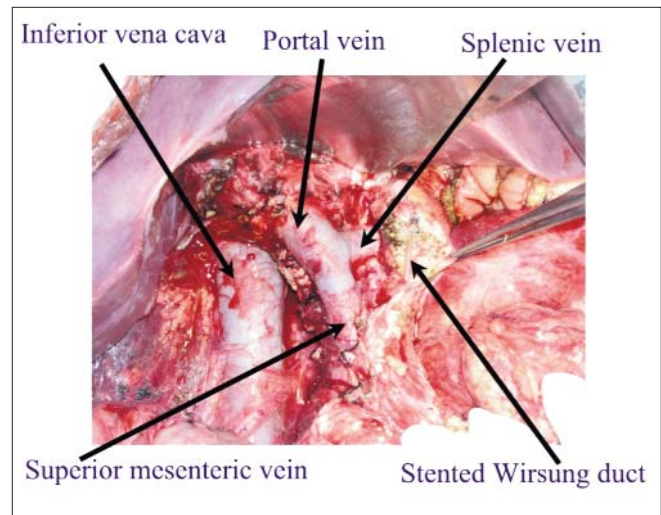


Figure 4. The final aspect after resection, with a stent placed in Wirsung duct

trauma) is the most challenging. The trauma surgeon will have to find the best choice with minimal pancreatic tissue loss. Due to the rarity of such lesions, the studies are rare and there is no general consensus. Injuries to the distal pancreas are generally treated by distal pancreatectomy with or without splenectomy. The management of the proximal pancreatic duct injury is generally suture, some authors however suggested the proximal duct should be anastomosed with Roux en Y loop to minimise the risk of fistula (5,6,7,8,9). A more conservative approach in distal injuries would be abstention of resection of the distal pancreas and performing a pancreatico-enterostomy (10,11). Pancreatico-gastrostomy follows the same principles and appears easier to perform and safer than pancreatico-jejunostomy (10).

In proximal injuries with minimal duct disruption the safest option is external drainage (5,12). Another possibility would be patching a Roux-en-Y loop on to the injured area of the pancreas. However this technique carries a high risk of anastomotic leakage (5,6). In combined pancreatico-duodenal injuries, primary duodenal repair, pancreatic drainage and duodenal decompression, even using pyloric exclusion, can be considered whenever possible (5,13).

Pancreatico-duodenectomy is a rare procedure in trauma indicated in massive destruction of the pancreas and duodenum.

Pancreatico-duodenectomy in trauma presents the risk of leakage following anastomosis with a general normal, soft pancreatic stump, with nondilated MPD and a narrow normal bile duct. Two-stage pancreatico-duodenectomy was therefore proposed (5,14,15).

Resection is performed in the initial damage control operation, the stomach, jejunum and pancreatic stump are closed and bile duct ligated. The reconstruction is performed at 48 hours in a stable patient with a dilated bile duct which facilitates anastomosis and decreases risk of complications.

Pancreatico-duodenectomy in trauma differs from pancreatico-duodenectomy in cancer in the way that the

uncinate process can be preserved and the surgeon can operate away from the superior mesenteric vein. For complete section of the main pancreatic duct, primary repair has also been performed with good results (16,17,18,19,20,21,22,23,24,25, 26); it seems an interesting method for selected patients with complete pancreatic transection after blunt trauma. A simplified pancreatico-duodenectomy was described by Feng Xing-Fu (1) in a partial devitalisation of the head of pancreas and duodenum. The authors resected the duodenum and devitalized of the head of pancreas and a direct end-to-side anastomosis was between a loop of jejunum and the remaining pancreatic head with a stump of distal bile duct and MPD opening on its' surface. Thus they avoided separate anastomosis with a small diameter bile and pancreatic duct (1).

Among cases treated surgically for pancreatic trauma, complications are found in 20 to 40% of cases, with a particularly higher rate in pancreaticoduodenal injuries (5,7, 27,28). Postoperative complications like pancreatic fistulas, bile leakage and intraperitoneal abscesses can be associated with pancreaticojejunal anastomotic dehiscence and the autodigestion of the anastomosis region (1,29,30). If adequate external drainage and nutritional support are provided, the fistulas can be resolved spontaneously in 1-2 weeks after injury (5,31).

The incidence of abscess formation ranges between 10-25% and depends on the other associated injuries (5). Once constituted, the abscesses can be managed by percutaneous drained, with ultrasound or CT guidance. If the location of the abscess does not permit a percutaneous drainage, re-laparotomy is necessary.

Post-pancreatectomy hemorrhage is a serious complication and a significant cause of morbidity. The exact mechanism of hemorrhage is unclear, but it seems to have its origins in the surrounding vessels as a result of the local sepsis, retroperitoneal autodigestion or the association with a pancreatic leak (5,32, 33,34,35,36,37) Brodsky and Turnbull reported the association

of a late hemorrhage in 75% of the patients with pancreatic leaks (38). Yekebas et al pointed out that the association of late hemorrhage with pancreatic fistula is more frequently lethal than the late pancreatic hemorrhage with other sources (39).

The real temporal correlation between the presence of a postoperative pancreatic leakage and the moment of apparition of the late pancreatic hemorrhage remains unknown (34).

The delayed hemorrhage is better dealt with interventional angiography - embolisation in stable patients and re-laparotomy in hemodynamical unstable cases (5,35). Yekebas et al also reported cases who required re-laparotomy to control hemorrhage after the failure of initial interventional radiology (38,39). Choi et al observed a bleeding rate of 10% after embolisation, successfully treated by re-embolisation (35,36).

Pseudocysts after pancreatic trauma can develop at weeks or even months after the original pancreatic injury. If the MPD is intact (as shown by ERCP) interventional options can include percutaneous drainage (40,41) but it has a high risk of re-accumulation or the development of a pancreatic cutaneous fistula. If a disruption of MPD is observed, internal or distal pancreatectomy is the best solution (5,42,43).

Mild pancreatitis can be found in up to 18% patients who underwent surgery for pancreatic trauma and usually it can be treated conservatively (5,8,44,45).

A very seriously complication which can develop in such cases is the haemorrhagic pancreatitis, but, fortunately it is rare (46,47).

Patients that undergo pancreaticoduodenectomy at a younger age are more likely to develop diabetes mellitus and steatorrhea than their older counterparts, but these complications are unusual after resection for pancreatic trauma because the extent of pancreatic resected tissue is lower compared to the same resection in surgical oncology (48,49).

Conclusions

Pancreatic trauma is a rare condition generally associated with other lesions. its management is unstandardized and surgeon has to choose from variate techniques described (50,51,52). It seems however that drainage alone is a good choice in minor trauma while in serious disruption of the MPD, pancreaticogastrostomy is a good choice. Resection should be performed only in case of extreme necessary and even then loss of pancreatic tissue should be minimised.

Pancreatico-duodenectomy should be an extremely rare procedure when no other reasonable choice is possible. It will be accompanied by severe morbidity and mortality

Contributing authors

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