CASE REPORT

Parenchyma preserving surgery in pancreatic trauma

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Introduction

The pancreas is a retroperitoneal structure, lying posteriorly across the upper lumbar vertebrae extending from the curvature of the duodenum to the hilum of the spleen. Therefore, injuries to the pancreas are not that common with abdominal injuries, accounting for about 4% of all abdominal injuries and especially in children; it's about 0.5% [1][2]. One of the problems associated with pancreatic injuries following blunt abdominal trauma is its delay in diagnosis or misdiagnosis causing high morbidity and mortality.

The mechanism of injury of nonpenetrating pancreatic trauma is either due to acceleration-deceleration forces on the parenchyma or due to crushing injury of the parenchyma on the vertebral column. The crushing injuries results in fracture of the parenchyma at the level of the neck or body region due to compression over the lumbar vertebrae. This can lead to complete or partial injury of the pancreatic duct. Even though major ductal injuries account only for about 15% of all pancreatic injuries, it carries higher morbidity as well as higher mortality [3]. Therefore, early diagnosis and vigorous treatment are paramount. Pancreatic injuries are graded according to the American Association for the Surgery on Trauma[4]. The diagnosis and grading of pancreatic injuries in abdominal trauma are usually done with the operative findings in cases of open injuries and by the findings in imaging, especially by contrast-enhanced CT scan in cases of blunt abdominal injury. The sensitivity and specificity of the CECT in detecting pancreatic trauma are around 87-98%, respectively, and in about 40% of cases, it may be undetected, especially if carried out early that is within 12 hours following injury [5]. The CT scanning should be done according to the pancreatic protocol to increase the sensitivity. The ductal injury, which is a major prognostic factor in pancreatic injuries, can be missed if there is a partial rupture. If such is suspected, further imaging should be carried out to confirm the diagnosis by either an ERCP or MRCP. In certain situations, the ductal injuries are diagnosed intra-operatively while exploratory laparotomy is being carried out for acute abdomen following trauma.

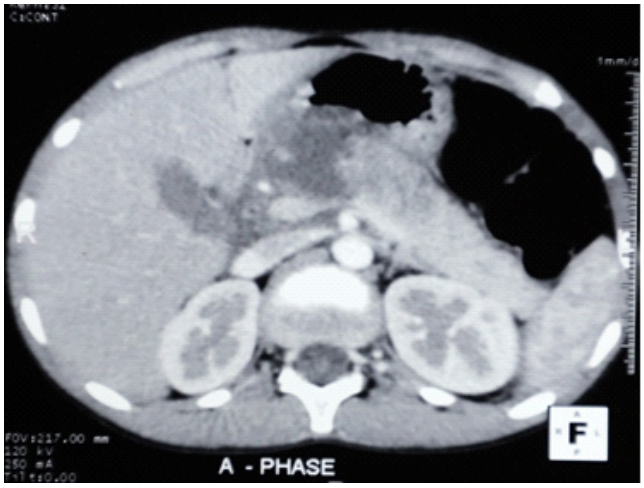

Figure 1. The CECT films of the pancreatic injury

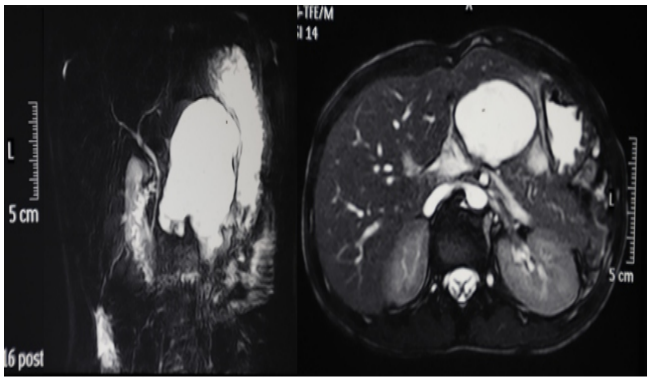

Figure 2. MRCP of the collection following the injury

We present here a case report on a pancreatic injury of a 14-year-old boy who presented late to a tertiary care centre with complete ductal disruption and its management. This patient sustained a blunt abdominal trauma when he had fallen onto a cement block and was transferred to a tertiary care unit after 5 days following the injury. On presentation, the patient was complaining of severe abdominal pain Ultra sound scan has shown free fluid posterior to the stomach and the subsequent contrast-enhanced CT showed evidence of pancreatic injury with a localized fluid collection posterior to the stomach [Figure 1].

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The imaging showed a pancreatic transection near the neck. This was a grade IV injury, according to the pancreatic injury scale. There were no other injuries. The patient was hemodynamically stable and there was localized tenderness and guarding in the epigastrium.

Since there was evidence of main pancreatic duct disruption, an MRCP was carried out, which demonstrated a complete transection of the neck of the pancreas including the main pancreatic duct. Both proximal and distal portions were viable and there was no injury to the splenic vessels. The fluid collection was localized to the lesser sac. The collection was around 7x9 cm which was also symptomatic as it was pushing the stomach anteriorly.

Since the boy was transferred 5 days later it was not safe to do an early operation of repairing the duct over a stent or performing a pancreaticojejunostomy due to severe inflammation in and around that area. The possibility of distal pancreatectomy was ruled out as this would have caused endocrine and exocrine insufficiency in the child since the distal segment was about 80% of the total parenchyma. This caused a management dilemma but the patient was managed with analgesics and a few days later started on an oral diet. He responded to the conservative management but required definitive treatment as he was getting symptomatic with the fluid collection. His requirement for analgesics escalated and in addition, he required a regular dose of anti-emetics.

He was managed conservatively in the initial period allowing the fluid collection to be well localized. After about 6 weeks, he was reimaged to check the thickness of the cyst wall. This revealed a thick fibrous cyst wall which was closely adherent to the stomach and the position was also favourable for a cyst gastrostomy. A cyst gastrostomy was carried out under general anaesthesia and he had an uneventful recovery. This was followed by a good recovery in the perioperative period. He was followed up for 3 years and there were no complications. He did not have endocrine or exocrine insufficiency. His weight gain and growth were normal.

Discussion

One of the main challenges in blunt abdominal trauma is the diagnosis of retroperitoneal injuries, of which pancreatic injuries carry higher morbidity and mortality adversely affecting the outcome. In a resource-poor setting in Sri Lanka where CT scans and MR scans are only available in tertiary care centres, the diagnoses of such injuries are being made on clinical and on the available imaging modalities such as sonography and X-rays. This explains the delay in the transfer of this patient to a tertiary centre. On presentation to the tertiary care unit, the child was hemodynamically stable and the abdomen did not show any evidence of peritoneal irritation, except for some tenderness in the epigastric region. This presentation gave us a chance of investigating him further and did not warrant an early laparotomy which otherwise would have led to a disruption of the well-localized collection. This would have led to a distal pancreatectomy which would be the only option available in a laparotomy in a situation like this. There was no possibility of stenting the main pancreatic duct as demonstrated in the MRCP that there was a complete disruption of the main duct. An ERCP was not attempted at that time for pancreatic duct stenting due to this reason. The advantage was that the collection between the proximal and distal segments was well localized in the lesser sac. However, on the other hand, the collection was significant in size [figure 2] and was causing pressure effects on the surrounding structures.

Since the collection was symptomatic with compression of the stomach, surgical intervention was required. Therefore, we decided on a cyst gastrostomy. This was carried out after 6 weeks giving ample time for the cyst wall to mature. The other alternative at that time was to perform a distal pancreatectomy. This would have resulted in an endocrine and exocrine failure of the child, which would have also led to many complications in his development. Pancreatico-jejunostomy to the distal segment is another option that is available in preserving the pancreatic parenchyma in a situation similar to this in early presentation. Since this was a delayed presentation, it would have been an unsafe procedure to carry out in the presence of intense inflammation in and around that area. This would have made the surgery difficult and given rise to complications like pancreatic fistulae and intra-abdominal collections. We planned to treat the collection with a cyst gastrostomy upon maturity of the cyst, as it was well localized and there was no peritonitis. There is much evidence in the literature to show that a cyst gastrostomy is a safe option in these kinds of presentations, especially in preserving the pancreatic parenchyma [6][7]. The other options would have been endoscopic cyst gastrostomy which requires endoscopic ultrasonography, which was not available in our setting or else an endoscopic transpapillary stenting of the collection. Both these were not attempted as we did not have the necessary equipment and expertise.

This procedure was carried out with minimal disturbances and with no complications. We can strongly recommend this approach in selected patients as safe and effective in late presentation of pancreatic trauma with the localized fluid collection. This is also parenchyma preserving surgery which is essential in the pediatric age group.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

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Learning Points:

- Parenchymal preserving surgery is possible in late presentations following pancreatic trauma.
- Adequate time should be allowed for the localized collection to be properly walled off with fibrous capsule.
- A cyst gastrostomy is a safe option for a well localized walled off collections following a complete transection of the pancreas.
- This preserves the endocrine and exocrine function of the pancreas.