Missed Diagnosis: Blunt Abdominal Injury-Case Report

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Abstract
Acute pancreatitis is an uncommon finding in children and therefore one must have a high index of suspicion when evaluating children with blunt abdominal trauma. It can cause severe morbidity and mortality and requires one to be vigilant to make the diagnosis and to ensure appropriate management. We report on a case of acute pancreatitis that had diagnostic and management dilemmas at Colonial War Memorial Hospital (CWMH) in Fiji. (PHD 2011; Vol. 16(2): p70-74).

Key Words
Pancreatitis, distal pancreatectomy, auto-digestion, abdominal Trauma

Case Presentation

An 8 year old Chinese female presented to the Colonial War Memorial Hospital (CWMH) under the care of adult general surgeons with a two day history of having colicky abdominal pain associated with bilious vomiting and fever. She gave a history of sustaining a blunt abdominal injury during a swimming class when she fell onto a diving board the day prior to the onset of pain. There was no significant past medical, drug or familial history.

On examination, she was clinically well and haemodynamically stable. Initial abdominal examination showed no palpable masses or peritonism. Other systemic examinations were unremarkable. Her full blood count, renal function and electrolytes on admission were normal. Serum amylase was significantly elevated at 1105 units/l and unfortunately this result was only available after surgery.

The initial ultrasound of the abdomen on the day of admission showed presence of fluids in the peritoneal space mainly in the right iliac fossa and pelvis. She however continued to have increasingly severe colicky abdominal pain after admission.

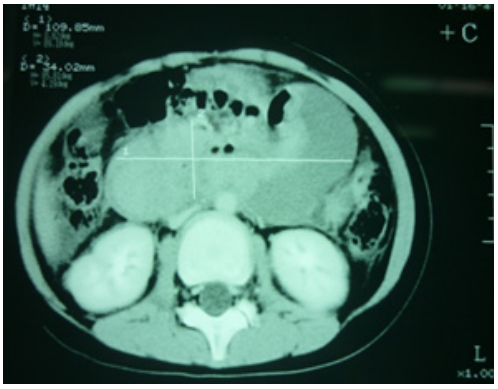

Figure 1: CT Scan of Patient

The abdominal U/S scan was repeated the following day and this was reported by two radiologists as suspicious for intussusception. Retrospectively, the U/S scan findings were not consistent with intussusception. A plain abdominal x-ray showed dilated small bowel loops with minimal air-fluid levels and no extraluminal retroperitoneal air in the area of duodenum. The abdominal CT Scan with IV contrast in retrospect showed significant peripancreatic oedema with intact pancreatic duct, duodenal intramural haematoma and contusion, free peritoneal fluids and no free gas. However, no upper gastrointestinal contrast was used in this case to assess for duodenal perforation.

Given her ongoing abdominal pain, she underwent an emergency laparotomy. Intra-operatively, she was found to have acute pancreatitis with oedema involving predominantly the head of the pancreas, gross swelling and haematoma around the duodenum with multiple calcified deposits on omentum and on the pancreas. She also had moderate ascites and other intra-peritoneal viscera were normal. She recovered well and was discharged after 5 days without any complications of pancreatitis or complications of having a laparotomy. In retrospect, she should have been managed conservatively with better correlation of her clinical finding and investigations and as such, avoided having an unnecessary laparotomy.

Discussion

Acute pancreatitis is most commonly seen in the adult male population due to alcohol consumption (35%) or as a complication of having gallstones (40%).[1] It is defined as the chemical autodigestion of the pancreatic parenchyma by its own enzymes resulting from multiple triggers that cause activation of proteases within the pancreas.[2]

Acute pancreatitis is an uncommon finding in children. The rate of pancreatitis in children under 15 years in developed countries have been reported around 2.7 cases per 100,000.[3] Leading cause of acute pancreatitis in children is blunt abdominal injury either from a bicycle handle-bar or road traffic accident, but one must always consider the possibility of child abuse.[3] Other minor abdominal traumas sustained in play areas such as the monkey bars, direct force from a kick or a punch to the epigastrium and other forms of non-accidental injury have also been reported.[4]

Pancreatic injury resulting in pancreatitis in children has not been reported previously in Fiji and the incidence and epidemiological trends are unknown. Very few children in Fiji have bicycles or would have been exposed to playing field where monkey bars are available. As such, the aetiology of traumatic pancreatitis in Fiji might be different from other reported literatures. Our case report sustained injury from falling onto a diving board. However, the fall did not stop her from continuing with her swimming class on the day. This showed that mild or trivial blunt abdominal injury in thinly built children can be significant to cause pancreatic injury which could lead to pancreatitis. As also reported in other studies, our patients also had an intramural duodenal haematoma which is usually associated with pancreatic injury.[5] This duodenal haematoma or injury was missed in the initial abdominal CT scan report prior to surgery.

Other aetiologies of pancreatitis including mumps, metabolic, tropical pancreatitis, hereditary or familial pancreatitis, parasites and lipid abnormality are rare in children.[8] These aetiologies have not been encountered in our institution. Other conditions such as cystic fibrosis causing pancreatitis are seen in Caucasian but extremely rare and have not been reported in Fijians.

The diagnosis of acute pancreatitis in children can sometimes be challenging on admission. The symptoms in children are vague and it's not the classical abdominal pain that we see in adults. Symptoms of epigastric pain which radiates to the back and are relieved with crouching or sitting forward are seen mostly in adults. Other non-specific gastrointestinal symptoms include nausea, vomiting with decreased appetite. The child may be icteric, with a distended tender abdomen with decreased bowel sounds. Systemic Inflammatory Response Syndrome (SIRS) will be present in almost all the cases as a result of trauma or the pancreatitis.[6] Therefore, any history of trivial blunt abdominal injury should be taken seriously and should be considered in the assessment of children presenting with abdominal pain. As with our patient, children could present with recurrent colicky abdominal pain post

trauma. Retrospectively, in this case, we attributed the colicky abdominal pain to the intramural duodenal haematoma with the pain being mainly in the upper abdomen.

Other possible diagnosis following blunt abdominal injury in children are possible if the mechanism of injury was of a significant force such as in a road traffic accident or significant blow to the abdomen. This includes a perforated viscus, visceral injury or a mesenteric tear with ischaemic bowel. However, this would have resulted in generalized peritonitis and a haemodynamically unstable patient on presentation, hence the need to do an urgent laparotomy. This patient presented 2 days after the injury and was otherwise clinically stable.

Further investigations should also be considered with elevated serum amylase and serum lipase seen in pancreatitis. Raised serum amylase or serum lipase is diagnostic of acute pancreatitis in majority of paediatric cases. The serum amylase, which is available in our practice, has a sensitivity of almost 80%.[7] This could still be normal within the first 24 hours after the injury, hence the serum lipase, which has a sensitivity of 85-100% is more specific but it is only available in our setting in the private practice. This serum amylase unfortunately was missed in our pre-operative assessment and the results were only available after surgery. Other causes of hyperamylasemia such as bowel or mesenteric ischaemia, bowel perforation, salivary gland and pelvic pathologies are not common in children.[1] Other haematological markers used in the Ranson's criteria such as raised white cell count, elevated glucose raised hematocrit, hypocalcaemia can be useful to assist in the diagnosis when radiological investigations are not available.[8]

Retrospectively, with our case, the team should have checked the serum amylase results and correlated this with the CT scan findings before any surgical intervention was done. In some cases of pancreatitis, plain radiographs are useful in eliminating other causes of acute abdomen e.g. in blunt abdominal trauma, an erect chest x-ray can be useful to exclude pneumoperitoneum from a perforated viscus. With pancreatitis, one may notice other non-specific signs such as sentinel loops ("colon cut-off" sign), obscured psoas margins and a dilated duodenum which can be difficult to identify in children. Only a third of adult patients have radiological abnormalities of a chest x-ray which include pleural effusion and basal atelectasis.[9] Developing countries where CT scan is not readily available, surgeons may need to resort to other radiological investigations such as abdominal X-rays and chest x-ray apart from the serum amylase to assist with the diagnosis or exclusion of pancreatitis.

The role of U/S scan in blunt abdominal trauma is useful to assess for presence of fluids in the abdomen but is limited when assessing severity of visceral injury or visceral trauma.[10] As such, emphasis should be placed on serial abdominal examinations and correlating this with available results, biochemical and radiological findings.

CT scan of the abdomen when available is the ideal diagnostic modality in the assessment of the complications of pancreatitis, severity of pancreatic injury and pancreatic duct assessment.[11] Treatment options however will depend on the complications of pancreatitis such as having pancreatic abscess or peri-pancreatic fluids or pseudocyst and ruptured pseudocyst causing intra-peritoneal bleeding or peritonitis. In the acute presentation of blunt abdominal injury, CT scan is also useful in the assessment of the patency of the pancreatic duct. This should be combined with oral or intravenous contrast to exclude other visceral injuries or perforated hollow viscus.[12] Despite doing an abdominal CT scan, we failed to diagnose the features of pancreatic injury in this case.

The surgical management of acute pancreatitis in children involves a multi-disciplinary approach. Initial management include rehydration with IV fluid therapy and adequate analgesia. Emphasis should be placed on early and continuing enteral feeds and the use of Total Parenteral Nutrition (TPN) is reserved for severe cases. Enteral feeding is also particularly beneficial in our institution given that it is readily available, cheap, has less complications and beneficial as compared to TPN.

Surgical intervention in severe pancreatitis in children is limited to it's complications. Once traumatic pancreatitis without duct injury has developed, management is conservative[13] and any further surgical intervention might be indicated only if they have developed complication. Lack of appreciation of this condition would result in unnecessary laparotomies.

Conclusion

Acute pancreatitis is uncommon in our paediatric population in Fiji. Trauma, as reported is the commonest cause of pancreatitis in children. Our case report of traumatic pancreatitis highlighted that the pancreas can be traumatized in normal childhood activities such as a swimming class. The clinical presentations may be not specific to pancreatitis or to pancreatic injury, hence the importance of having biochemical and radiological investigations to confirm the diagnosis. A stable patient would be assessed by doing serial abdominal examination and correlating this with CT or U/S scan findings. Early and correct diagnosis will assist the team in the conservative management of pancreatitis thus reducing the complications of doing unnecessary laparotomies. As such, in an acute setting, one would justify surgery in blunt abdominal injury in children when they present haemodynamically unstable from haemorrhagic shock despite aggressive fluids/blood replacement or peritoneal soiling from a ruptured hollow viscus. Acute traumatic pancreatitis should be treated conservatively unless there is associated pancreatic duct transection or later when they have developed complications of pancreatitis.

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