

Pancreatic Transection in a 6-year Child Following Bicycle Handlebar Injury

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ABSTRACT

Bicycle handlebar injuries are the commonest cause of pancreatic trauma in children and adolescents, especially in males. Recognition of such injuries and initiation of correct treatment may be delayed when there is no abdominal wall bruising. We present a case of a 6-year boy with severe pancreatic trauma, who was referred from a local hospital following bicycle handlebar injury five days earlier. Contrast-enhanced computed tomography showed grade III pancreatic injury, which was repaired the following day; and he subsequently made a good recovery. The case highlights challenges faced by non-specialist clinicians working in resource-limited settings in diagnosing these injuries.

Key Words: Bicycle handlebar injury, Blunt trauma, Pancreatic injury.

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INTRODUCTION

Abdominal trauma accounts for <10% of all childhood injuries and can be life-threatening.¹ Pancreatic injuries are the fourth commonest cause of intra-abdominal injuries after spleen, liver, and kidney.¹ The incidence of pancreatic injury in children varies between 3–12% of all blunt abdominal traumas.^{2,3} The American Association for the Surgery of Trauma (AAST) injury scoring scale is the most widely accepted tool for classifying the severity of pancreatic injuries.⁴ We report a case of a 6-year boy with AAST grade-III pancreatic injury following blunt trauma to abdomen.

CASE REPORT

A 6-year boy presented to the Emergency Department in a specialist centre in northeastern India with abdominal pain and an episode of bilious vomiting. He had fallen from a bicycle five days earlier and had hit his abdomen on the handlebar. There was no history of fever, abdominal wall bruising, or bleeding from any site. He was managed in a local hospital with analgesics and fluids.

His temperature was 36.4°C, heart rate 108 beats/min, respiratory rate 26 breaths/min, blood pressure 127/89, and oxygen saturation 95% on air. The abdomen was tense, warm, and tender to palpation with rebound tenderness in periumbilical region; bowel sounds were reduced.

A contrast-enhanced computed tomography (CECT) of the abdomen (Figure 1) and magnetic resonance cholangiopancreatography (MRCP) showed pancreatic transection at the junction of head and body with complete transection of the main pancreatic duct. No vascular injury, or injury to the liver or spleen was seen.

He was diagnosed with AAST grade-III pancreatic injury and was given intravenous fluids, antibiotics (cefotaxime and metronidazole), analgesics and omeprazole. Octreotide infusion was started to reduce gastrointestinal, biliary, and pancreatic secretions, and to decrease gastrointestinal motility. Blood results showed a total leucocyte count of $18 \times 10^9/L$, C-reactive protein 246 mg/L, serum amylase 193 IU/L, and lipase 1099 IU/L. Hyponatremia with serum sodium of 125 mmol/L was corrected preoperatively.

At laparotomy, a large haematoma near the head of the pancreas, and total pancreatic fracture at the junction of the neck and body were identified (Figure 2). Repair of pancreatic laceration, debridement of peri-pancreatic tissue with pancreatico-gastrostomy and drainage of hematoma were performed. Two intra-abdominal drains were left *in situ* and removed on day-6. He recovered well in the postoperative period; pancreatic enzyme levels improved and he was discharged on day-9. At day-7 post-discharge, the scar site was healthy and he was making good progress. Review after three months showed complete recovery; he was referred to the care of local paediatrician.

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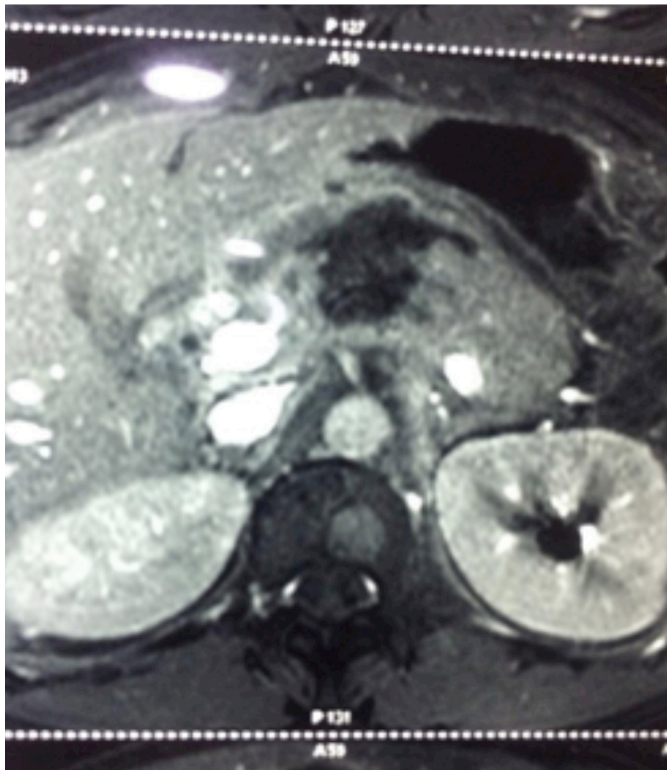


Figure 1: Contrast-enhanced CT scan showing pancreatic injury.

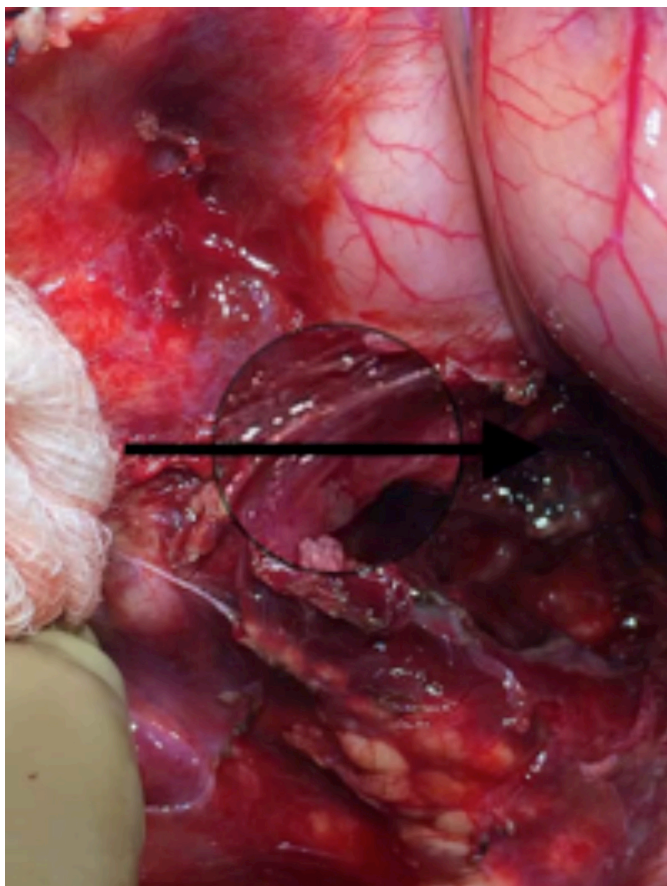


Figure 2: Transected pancreas seen at operation [black arrow].

DISCUSSION

A Chinese study of abdominal injuries involving bicycle handlebars with 219 children (187 boys) aged <17 years highlighted that most children sustained isolated injuries involving solid organs: liver (n=184), pancreas (n=33), spleen (n=23) and kidneys (n=16).⁵ No deaths were reported and the overall outcome was good.⁵

Severe pancreatic injury in children is most commonly seen in polytrauma situations, typically motor vehicle accidents, and bicycle handlebar injuries (especially in boys).² Pancreatic injuries can be difficult to diagnose, and low-grade injury may remain undiagnosed. In the absence of gross structural damage, elevated pancreatic lipase or amylase may suggest pancreatic injury.² CECT is the preferred diagnostic imaging modality for hemodynamically stable children with suspected pancreatic injury.³ MRCP or endoscopic retrograde cholangiopancreatography (ERCP) enhances the diagnostic accuracy of ductal injury.³

An Australian study with 91 cases identified two distinct groups of patients: Group A (less severe) had 59 cases with abdominal trauma and elevated serum lipase but no CT or ultrasound evidence of pancreatic injury; and Group B (more severe) had 32 with history of abdominal trauma, elevated serum lipase also had CT and/or ultrasound evidence of pancreatic injury.² The study found that bicycle handlebar injuries were more likely to lead to severe pancreatic injury (6/59 in Group A, 13/32 in Group B; $p=0.001$) than motor vehicle injuries.²

AUS study with 424 cases compared operative *versus* non-operative management of pediatric blunt pancreatic trauma.¹ The study found that irrespective of the severity of the injury, the children managed non-operatively had equivalent or better outcomes (overall complications, length of stay, need for ICU admission, or death) than those with operative or delayed operative management.¹

A recently published systematic review and meta-analysis of 42 studies involving a total of 1,754 children (aged <18 years) with blunt pancreatic injuries, reported that 1,095 were initially managed non-operatively and 659 operatively.⁶ The authors concluded that there were no clear existing guidelines for the initial management of blunt pancreatic trauma in children, and that most children can be treated conservatively; surgical intervention should be limited to high-grade ductal injury patients (AAST \geq III), who are likely to benefit from early surgical intervention as seen in this case.⁶

The pancreatic injury should be considered as blunt trauma involving the abdomen, especially after bicycle handlebar injury, even when there is no obvious bruising. Elevated pancreatic enzymes may be suggestive of pancreatic trauma in low-grade injuries in the absence of positive findings in CT scan images. Although the decision for the need of surgical intervention rests with the clinical team caring for the patient, the management of blunt pancreatic trauma remains controversial; and the conservative management may be beneficial. This case reflects diagnostic and management challenges that

clinicians may face in resource-limited settings.

PATIENT'S CONSENT:

Informed consent has been obtained from the parent of the patient to publish the data concerning this case.

CONFLICT OF INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

GSK: Concept, overall patient management, manuscript preparation, literature search, obtaining electronic images, and patient consent.

DB: Specialist input into radiological and surgical aspects of the paper.

RKB: Supervision and paediatric gastroenterology specialist input in the paper.

SPP: Concept, supervision, manuscript editing and revising, and providing expert opinion on the paper.

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