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A delayed presentation of a traumatic isolated duodenal injury

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Abstract

Blunt injury to the abdomen resulting in isolated duodenal injury is rare in surgical practice. Due to the insidious onset of symptoms and the vague non-specific nature of the clinical presentation, these injuries can be easily missed even in experienced hands. Contrary to Europe or developed countries, assaults to the abdomen using hands, fists, and feet in home-based violence is common in third-world countries. These patients have the habit of hiding the assault part of the history to avoid litigations to 'known' people. A high level of suspicion, a continuous revisiting of the history, and timely damage control surgery can improve the outcomes of such patients.

Keywords

Critical care, emergency medicine, surgery, duodenal injury, blunt trauma

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Introduction

Isolated duodenal injuries are a relatively infrequent and diagnostically challenging entity in trauma surgery. Insidious onset of symptoms and subtle and non-specific physical signs owing to the retroperitoneal location may cause diagnostic delay leading to fatal consequences. Thus, a high index of suspicion is required to diagnose and manage such patients. Here, we describe a patient with an isolated duodenal injury who underwent pyloric exclusion and diverting loop gastrojejunostomy in a resource-poor setting.

Case report

A 29-year-old male patient was admitted to surgical casualty complaining of lower abdominal pain for a 1-day duration. His pain was vague and dull in character. It was more in the right iliac fossa (RIF) region and progressively worsening. He did not have circum-umbilical pain preceding the RIF pain. He had a feeling of 'unwellness' but no associated vomiting or fever. He did not have dysuria, haematuria, altered bowel habits, or bleeding per rectum. He denied trauma to the abdomen. He had not taken over-the-counter medications except for paracetamol and this was the first doctor encounter with his abdominal pain.

He was an otherwise well patient without medical comorbidities. He was never subjected to surgery before. He was an occasional alcohol consumer, but he denied an episode of alcohol intake before the admission. He was not a smoker and had no allergies.

A thin-built male came walking into the ward. He was not pale. His pulse rate was around 92–96 beats/min with a blood pressure of 110/80 mmHg. No objective evidence of fever. He was not tachypneic (respiratory rate 12/min), and auscultation of the lungs was normal. Abdominal examination revealed deep tenderness over the RIF region without rebound tenderness. Abdomen moved well with respiration. His liver dullness was preserved and had no free fluid in the abdomen on percussion. Another system examination was unremarkable.

His white blood cell count was $14 \times 10^3/\mu L$ (neutrophils – 72%), platelets – $210 \times 10^5/\mu L$, and CRP – 68 mg/L. Urine analysis did not show any abnormal cells, red cells, casts, or crystals. Being a peripherally located hospital, ultrasound and CT facilities were not available after 4 pm.

Based on the above findings, clinical suspicion of appendicitis was made. The patient was treated with analgesics and

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kept in an acute side bed with urine output monitoring. He was started on intravenous Cefuroxime and Metronidazole and prepared and planned for routine appendicectomy.

His vital parameters were stable throughout. Four hours after the admission, he developed a fever spike of 99.5 F. He was sweaty and warm. Abdominal examination revealed tenderness and guarding over the RIF region. He was tachycardic with a pulse rate of 110/min and had an increased respiratory rate of 16/min compared to admission. His blood pressure was 110/70 mmHg. Due to diagnostic uncertainty and deteriorating vital parameters with worsening abdominal signs, a clinical decision was taken to proceed with an emergency laparotomy. While explaining the condition to the patient, he revealed a history of blunt trauma to the right side of the abdomen by fist following an argument with a known person, which occurred 2 days ago. On further questioning, it was revealed he had hidden that information for fear of legal action. His symptoms had started about a day after the trauma to the abdomen.

Informed written consent was taken from the patient and the condition was explained to his family.

Surgery was performed with rapid sequence induction under general anaesthesia. Midline laparotomy was done. There was no free fluid, blood, or pus upon entry to the abdomen. Peritoneal survey was done systematically. All solid organs, stomach, small bowel, mesentery, transverse colon, left colon, and rectum were normal. Caecum and appendix also appeared normal.

There was a blackish/greenish discolouration with features of inflammation over the posterolateral side of the caecum towards the abdominal wall. It was ascending towards the hepatic flexure. In suspicion with a posterior caecal perforation, the caecum mobilized after dividing along the white line of Told. Upon entry to the retroperitoneum, a black-green watery fluid gushed into the surgical field. Samples were sent for culture and antibiotic sensitivity test. The fluid did not have a feculent smell. Examination of the posterior wall of the caecum and ascending colon did not reveal a perforation. However, the posterior wall of ascending colon was oedematous. With the suspicion of a duodenal perforation, hepatic flexure mobilization was done. There was a duodenal perforation in the D2–D3 junction towards the lateral wall with bilious content extravasation into the retroperitoneum.

It was around 2 cm in diameter longitudinal perforation. Edges of the perforated area were unhealthy and tissues were friable due to surrounding inflammation disabling the primary closure of the defect. Kocherisation of duodenum done. No other duodenal injury or bile duct injury was seen.

A diverting gastro jejunostomy with pyloric exclusion was performed. Pyloric exclusion was achieved with a purse-string suture running in the mucosa at the level of the pylorus with a 3-0 proline. Next, a ‘T’ tube was inserted into the duodenal defect and exteriorized. T tube was anchored to the duodenal defect with a purse-string suture using 3-0 polydioxanone. A nasojejunal tube was inserted through gastrojejunostomy. A feeding jejunostomy was performed for future feeding processes. After thorough peritoneal irrigation, drains were applied to the right para-colic gutter and gastro jejunostomy site before routine closure. The patient was sent for ICU care following surgery.

He was kept nill orally with intravenous antibiotics, pain relief, and physiotherapy. T tube drain was reduced gradually over time and was able to remove the drains by post-op day 7 except the T-tube drain. Upper GI contrast studies showed normal passage through gastro jejunostomy. He did not develop hospital-acquired infections. He was discharged on post-op day 9 with the T-tube drain.

Discussion

Isolated duodenal injuries are rare and challenging to diagnose due to the insidious onset of vague symptoms and signs.[1,2] It is more difficult to diagnose such an injury when patients do not reveal the preceding traumatic event, as in our case. Delayed presentation of such injury can result in chemical peritonitis, metabolic acidosis, SIRS, and sepsis ultimately leading to multi-organ failure and death. Most patients with duodenal injury present within the first 24 h. Many of them will present with epigastric pain, upper abdominal pain, and vomiting.[2,3] In contrast, the index patient presented after 48 h following trauma and had vague lower abdominal pain without upper abdominal symptoms or vomiting.

Penetrating trauma to the abdomen is the most common cause of duodenal injury. Blunt trauma causing duodenal perforation (road traffic accidents/punching in the abdomen) is less common.[2] Most of these incidents result in associated other organ injuries, especially liver, colon, and pancreas.[1] Isolated injury to the duodenum is a rarer entity in the surgical field.

In the context of an acute trauma setting, duodenal injuries are managed according to the ATLS protocol.[4] However, delayed presentations with obscured history as in our patient warrant experienced clinical judgement in diagnosis. In a resource-rich setting, the mainstay of identifying such injury is contrast-enhanced computerized topography of the abdomen. Oral contrast will not give an additional benefit in diagnosing duodenal perforation.[4,5] Duodenal wall thickening, poor enhancement of injured segment, periduodenal fluid or fluid in the right anterior pararenal space, and the ‘sentinel clot’ sign are contrast enhanced computerized topography signs of duodenal injury.[4] If oral contrast is used, extravasation of oral contrast into the lesser sac with the above findings is also diagnostic of duodenal injury.

In a setting where advanced imaging methods are not readily available, clinical examination/continuous monitoring and frequent revisiting of the history to evaluate traumatic

events which led to injury is pivotal in timely diagnosis. In contrast to Europe and other developed countries, people in the suburbs of Sri Lanka may still present late after assaults, especially when they are family based to avoid legal consequences to their 'known' people. Though it is rare, it is worth knowing these diverse presentations of injury which can lead to catastrophic events if misdiagnosed.

Management of a delayed presentation of an isolated duodenal injury depends on the haemodynamic stability of the patient and the severity of the injury itself.[4,6,7] Initial resuscitation with volume replacement and antibiotics is vital in preventing mortality in a septic patient. Most low-grade injuries diagnosed by pre-operative imaging in a haemodynamically stable patient can be managed conservatively.[4,7,8] Injuries found in laparotomy can be attempted for primary closure provided the patient is haemodynamically stable, injured duodenum is non-ischaemic with healthy edges, tension-free repair is achievable. In all other categories, it is wise to perform damage control procedures.

Our patient had unhealthy duodenal edges for primary duodenal repair. We performed a pyloric exclusion and diverting loop gastrojejunostomy to prevent gastric emptying to the injured duodenum. Although most of the literature shows no special benefit in pyloric exclusion, it was the best intraoperative decision to rest the duodenum. Insertion of a 'T'-tube duodenostomy to decompress the lumen has shown good outcomes in difficult-to-handle duodenal injuries.[6,9] Prophylactic placement of feeding jejunostomy aided immensely in improving the overall postoperative nutrition in our patient.

However, the new trend in managing a duodenal injury is to avoid complex procedures and to perform simple repair methods wherever possible.

Conclusion

Isolated duodenal injuries can present late especially in an assault when patients tend to hide injuries to avoid legal procedures. A high level of clinical expertise is required to diagnose such patients, especially in a resource-poor setting. Damage control surgery with diversion procedures in conjunction with T-tube duodenostomy can improve outcomes in these delayed presentations where primary repair is not possible.

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K P D J K Gunarathne – Design of the work/ writing/ Revision
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References

1. García Santos E, Soto Sánchez A, Verde JM, et al. Duodenal injuries due to trauma: review of the literature. *Cir Esp* 2015; 93: 68–74.
2. Pandey S, Niranjan A, Mishra S, et al. Retrospective analysis of duodenal injuries: a comprehensive overview. *Saudi J Gastroenterol* 2011; 17(2): 142–144.
3. Bhattacharjee HK, Misra MC, Kumar S, et al. Duodenal perforation following blunt abdominal trauma. *J Emerg Traum Shock* 2011; 4(4): 514–517.
4. UpToDate. Management of duodenal trauma in adults, https://www-uptodate-com.bibliotecadigital.uv.cl/contents/management-of-duodenal-trauma-in-adults?search=recognitionandmanagementofduodenumtraumainadults&source=search_result&selectedTitle=5~150&usage_type=default&display_rank=5
5. Gosangi B, Rocha TC and Duran-Mendicuti A. Imaging spectrum of duodenal emergencies. *Radiographics* 2020; 40(5): 1441–1457.
6. Burgess P, Fox JG and Taylor RMR. Management of duodenal injuries by proximal T-tube drainage. *Injury* 1991; 22(4): 321–322.
7. Aiolfi A, Matsushima K, Chang G, et al. Surgical trends in the management of duodenal injury. *J Gastrointest Surg* 2019; 23(2): 264–269.
8. Ratnasekera A and Ferrada P. Traumatic duodenal injury: current management update. *Curr Surg Rep* 2020; 8(5): 6.
9. Kutlu OC, Garcia S and Dissanaike S. The successful use of simple tube duodenostomy in large duodenal perforations from varied etiologies. *Int J Surg Case Rep* 2013; 4(3): 279–282.