Case study

Incidentally Detected Malrotation in a Case of Traumatic Gastric Perforation

Abstract :

Introduction

Intestinal malrotation is defined as intestinal nonrotation or incomplete rotation around the superior mesenteric artery, involving anomalies of intestinal fixation. The incidence of intestinal malrotation is estimated to be around 1 in 6,000 live births. Most patients remain asymptomatic and are incidentally detected at a surgical procedure or during an autopsy. Adult presentation accounts for 0.2 to 0.5% of all cases, of which only 15% present with midgut volvulus.

Case Presentation

A 36-year-old male presented as a casualty with blunt trauma to the abdomen two days ago. On examination, the patient had a BP of 90/60 mmHg and a pulse of 120 bpm. Per-abdomen examination showed diffuse tenderness with guarding and rigidity, and an X-ray of the chest showed gas under the diaphragm, which suggested perforation peritonitis with septic shock, for which he underwent an emergency laparotomy. There was a 5x5 cm anterior gastric perforation with the presence of a transverse colon going below the stomach and a jejunum with small bowel loops present on the right. An antrocolic isoperistaltic gastrojejunostomy was done. The postoperative period was uneventful, with the patient discharged on POD 10 with passing stool and on a normal oral diet.

Conclusion

Intestinal malrotation is a rare developmental anomaly of the embryonic gut. The most severe presentation is malrotation with bowel volvulus. 30% of cases occur in the first month of life, 60% by one year of age, and over 75% by the age of five. Adult presentation is only 0.2 to 0.5%, of which 15% present with midgut volvulus. The most common presentation is bilious vomiting in infants, while in older children, there is the presence of chronic and intermittent abdominal pain. CT shows the absence of the third part of the duodenum, with the whirlpool sign positive. The role of additional surgery, especially in asymptomatic patients with malrotation is debated. Surgically, it is treated by the Ladds procedure, which widens the mesenteric pedicle to prevent further volvulus.

Keywords :Malrotation, Midgut Volvulus, Gastrojejunostomy, Ladd

Introduction

Intestinal malrotation refers to an incomplete or complete lack of rotation around the superior mesenteric artery (SMA) axis, along with anomalies of intestinal fixation. The incidence is estimated to be 1 in 6,000 live births. Malrotation is symptomatic mostly in the first year of life, with complaints of abdominal pain, acute bowel obstruction, and intestinal ischemia due to midgut or cecal volvulus. Adult patients remain mostly asymptomatic and are detected incidentally at the time of surgery or during autopsy. [1]

This is a case of incidentally detected malrotation in a blunt trauma abdomen patient with gastric perforation.

Case Presentation

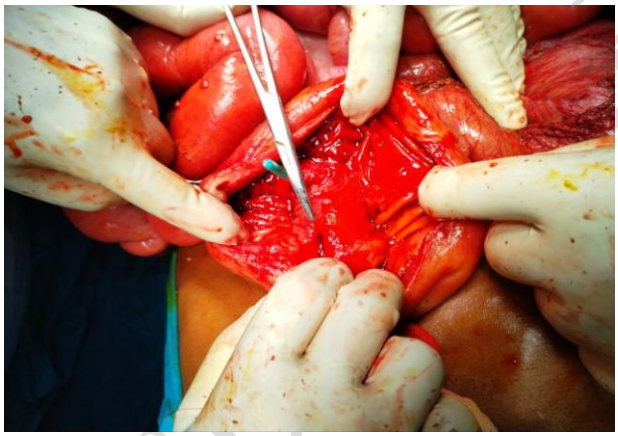
A 36-year-old Indian male came to the casualty with a complaint of abdominal pain and non-passage of the flatus and stool following a blunt trauma to the abdomen two days ago. On examination of patient vitals, he had a blood pressure of 90/60 mm Hg, a pulse rate of 130 beats per minute, a respiratory rate of 32 breaths per minute, a temperature of 99 °F, and a saturation of 78% in room air. On physical examination, the patient had abdominal distension, diffuse guarding, and rigidity.

An X-ray-ray done, which showed the presence of gas under the diaphragm, suggesting hollow viscus perforation.

Fig 1 : X-ray: Gas under Diaphragm

The patient underwent an emergency laparotomy, and a perforation of size 4x4 cm was present over the anterior surface of the stomach. Also, the transverse colon passed below the stomach with small bowels to the right. The 4th part of the duodenum and the duodenojejunal junction were not present.

fig 2-4 :Desection during Lacparotomy



Antrocolic isoperistaltic gastrojejunostomy was done. The post-operative period was uneventful. Patient was started on oral feed on day 4. Drains were removed on post-operative day 5. Stitches were removed on day 10. The patient was discharged uneventfully.

Discussion

At 6 weeks of gestation, the primitive bowel herniates into the umbilical cord and rotates anti-clockwise 90° around the SMA axis. At 6th to 10th weeks of gestation, the bowel grows and undergoes further 90° anticlockwise rotation. By the 10th week of gestation, the bowel reenters into the abdomen, and then another 90° anticlockwise rotation places the proximal duodenum posterior to the SMA. The distal ileum and proximal large intestine follow and undergo a 180-degree counter-clockwise rotation, placing the cecum in the right abdomen with its mesentery anterior to the SMA. [2]

From the 10th week on, the bowel undergoes a process of fixation, with the proximal duodenum becoming incorporated into the retroperitoneum with a sweeping C-shaped loop around the pancreas. This creates a duodenojejunal (DJJ) junction at the ligament of Treitz. The ascending and descending colons become fused to the lateral abdominal walls and retroperitoneum, and the cecum descends into the right lower quadrant. The small bowel blood supply becomes part of a broad wide mesentery extending from the left upper abdomen to the right lower abdomen. These points of fixation, specifically the duodenal sweep, the ligament of Treitz, and the right and left colon, stabilise the intestines and prevent catastrophic volvulus.[2]

Nonrotation/ malrotation of the bowel is usually accompanied by one or many Ladd bands; peritoneal attachments are formed, perhaps to fixate the bowel mesentery. These bands lead to the formation of volvulus, cause partial obstruction and may entrap the duodenum and proximal jejunum.[2]

The most serious complication is the midgut volvulus which involves the rotation of the root of a shortened bowel mesentery on its axis due to a lack of fixation. Mostly infants are involved and present with feeding intolerance and bilious vomiting.[2] Thirty percent of cases are seen in the first month of life, 60% by one year of age, and over 75% percent by the age of five. Adult patients are usually asymptomatic. Very rarely (0.2 to 0.5%), they present with chronic abdominal pain and, at times, with features of sudden obstruction due to the formation of midgut volvulus (15%) .[3]

Malrotation is also associated with the cecal volvulus and the formation of paraduodenal hernias. The first line of investigation for malrotation is ultrasonography (USG). USG shows superior mesenteric to the left of the superior mesenteric vein at its origin, along with the whirlpool sign being positive if vsolvulus is also present. Midgut volvulus is managed by the Ladd procedure. It involves three goals-lysis of Ladd bands, inspection of duodenum and proximal jejunum, and making a decision regarding the appendix 1.[2]

Conclusion

The adult presentation of malrotation is rare and difficult to diagnose. These are often incidental detections at the time of surgery for a different case or at the time of autopsy.

If the patient presents with a volvulus, then they would need to undergo a Ladd procedure.
In the case of an adult patient who is asymptomatic, just observation may be enough, as additional surgery doesn't bring any additional benefit to the patient. [4]

References

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