Case report

A FATAL CASE OF SMALL BOWEL OBSTRUCTION DUE TO CONSTRICTION BAND ENCOUNTERED IN AN ADULT IN FORENSIC SETTING

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Submit Date 2025-06-29

Revise Date 2025-08-20

Accept Date 2025-09-20

ABSTRACT

Background: We report a case of mechanical small bowel obstruction due to a constriction band and subsequent necrosis of the herniated part, in a 27-year-old female patient with no previous abdominal surgery. **Case Presentation:** She had been experiencing mild intermittent abdominal pain over the past six months, and she took analgesics and antacids only. The day before her death, she complained severe pain and underwent an ultrasound scan, which indicated a distended intestinal loop. She didn't seek a surgical opinion. In autopsy, a whitish fibrous constriction band of 1 to 2 cm width found attached to mesentery, from which distal jejunum and proximal ilium was herniating, which was gangrenous. Histo-pathological findings from herniated part showed coagulative necrosis of mucosal epithelial lining (transmural intestinal infarction). **Conclusion:** The timely diagnosis and intervention would have prevented the outcome. Though the constriction band is rare in adults, it should still be suspected as an etiology in patients without prior abdominal surgery.

KEYWORDS: Autopsy pathology; Constriction band; Forensic Pathology; Hospital Autopsy; Intestinal obstruction; Intestinal adhesion

INTRODUCTION

A 27-year-old female, having no history of abdominal surgery, had been experiencing mild intermittent abdominal pain over the past six months, which was alleviated by analgesics and antacids prescribed by a local general practitioner. The patient drank carbonated water (club soda) from time to time, as she believed that drinking it relieved her abdominal pain.

However, the condition persisted without improvement, and the pain was progressively increased in frequency, intensity, and duration as the days passed. The day before her death, she again consulted another local general practitioner, and upon his advice, she underwent an ultrasound scan, which indicated a distended small intestinal loop, and without further seeking a medical advice or taking a surgical opinion, she again only took over-the-counter pain relief medications by herself and went home. There was no history of vomiting or abdominal distension.

She was found unresponsive at midnight that day. Her husband and in-laws brought her to the primary health care facility where she was pronounced dead. Because this was a case of sudden death of a young female at her husband's home having marriage duration of less than seven years, the on-duty doctor flagged it as a medico-legal case and notified the police for necessary intervention. Even though her husband and in-laws did not want an autopsy to be conducted to find out the cause of death, the police sought expert opinion by requesting a medico-legal forensic autopsy to be performed by a panel of forensic doctors to prevent any future allegations from

her parents regarding the demand of dowry or foul play by the husband or in-laws in her death, so the medical officer at the primary health care facility referred the case at our tertiary care institute for the same.

CASE REPORT

External Autopsy Findings: Abdominal distension was apparent.

Internal Autopsy Findings: A distended, dark reddish purple, gangrenous intestinal loop was found (see Fig.1), consistent with the findings from the ultrasonography. No omental or mesenterial inflammation was evident. Peritoneal fluid was blood tinged.

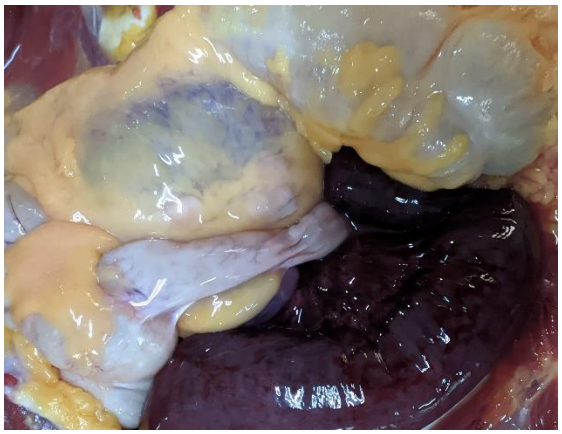

FIGURE 1 View of the intestinal loop after opening the abdominal cavity and shifting the greater omentum.

After shifting this diseased loop, the underlying cause for this ailment was found to be a whitish fibrous constriction band of 1 to 2 cm width (see Fig.2) attached to the mesentery, from which the distal jejunum and proximal ilium were herniating. This fibrous band caused vascular insufficiency of the bowel. No malrotation or other abnormality such as inflammation or intestinal adhesions were found.

FIGURE 2 Fibrous constriction band found after shifting the small intestinal loop.

Upon excision of the constriction band, a hemorrhagic line was found on the consistent adjacent part of the mesentery (see Fig.3).

Internal examination of the herniated part showed multiple focal area of loss of normal intestinal rugosity. The rest of the small intestine, which was outside this constriction band, was found to be normal. Mesenteric lymph nodes of size 0.5 cm to 1 cm were identified.

FIGURE 3 View of the intestinal loop after excision of the fibrous constriction band. Hemorrhagic line was found on mesentery which was near the constriction band.

Histo-pathological findings: Histopathology sections from lymph nodes showed congestion and hemorrhage. Microscopic pictures of sections from herniated part of small intestinal wall shows congestion, hemorrhage and necrosis in mucosa, submucosa, muscularis propria and serosa (transmural intestinal infarction), and destruction of the normal villous architecture and coagulative necrosis of mucosal epithelial lining (see Fig.4). Histopathology sections from brain, heart, lungs, liver, spleen and kidneys were unremarkable.

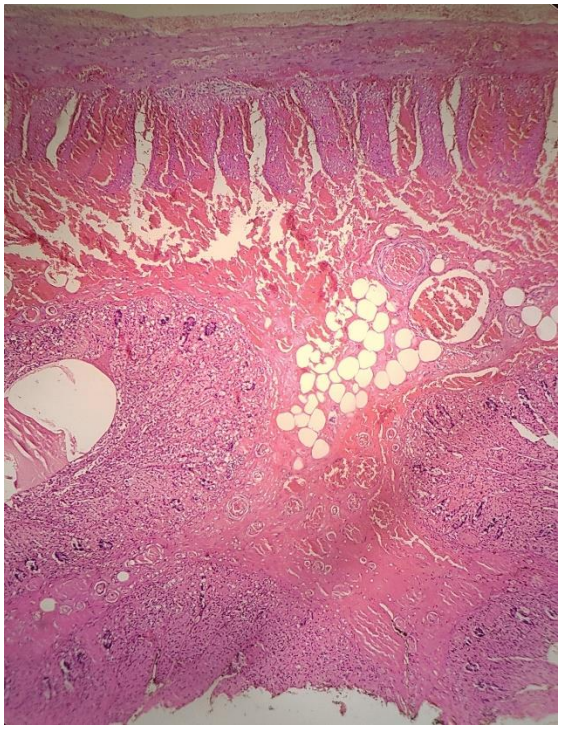

FIGURE 4 A

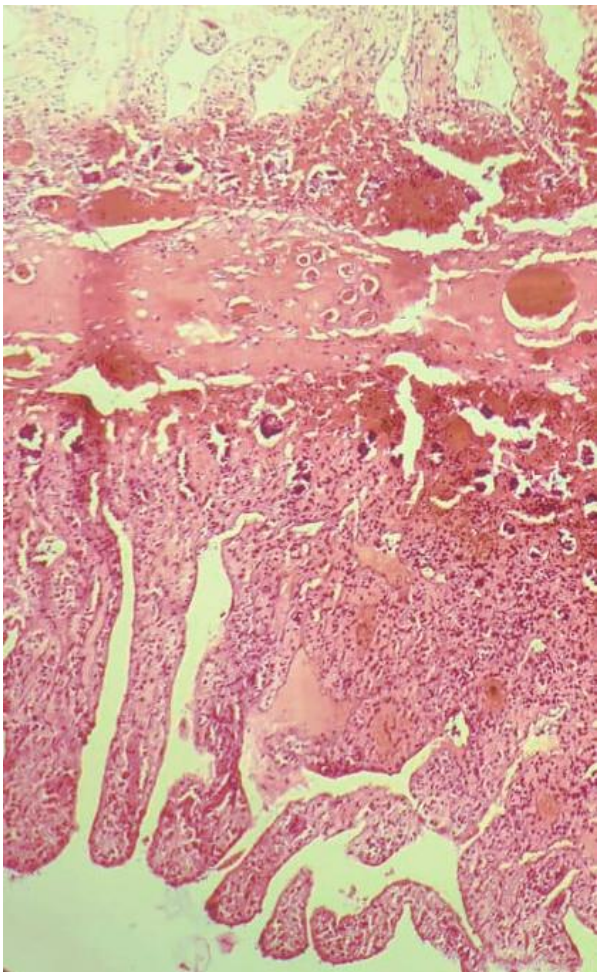

FIGURE 4 B

FIGURE 4 Microscopic pictures of sections from herniated part of small intestinal wall in Hematoxylin and Eosin stain. **A:** Congestion, hemorrhage and necrosis were present in mucosa, submucosa, muscularis propria and serosa (transmural intestinal infarction) (4x). **B:** destruction of the normal villous architecture and coagulative necrosis of mucosal epithelial lining (10x).

Cause of death: Death is opined to be due to complication of small intestinal necrosis following a constriction band formation, Manner of Death - Natural.

DISCUSSION

Small bowel obstruction (SBO) is mechanical blockage of intestinal contents and its propulsion, and it is one of the most common surgical emergencies resulting from various causative factors. Leading cause of small bowel obstruction are adhesions (60%) followed by hernia (25%) and neoplasms (5-10%) **(Weibel & Majno, 1973)**. Adhesions may be congenital or acquired (post inflammatory or post-operative) **(Weibel & Majno, 1973, Parker et al., 2001, Barmparas et al., 2010)**. Congenital constriction bands tend to declare themselves in early age. Other less common causes include intussusception, inflammatory bowel disease, and midgut volvulus. The predominant aetiology of SBO has shifted notably to post-operative adhesion because of the increasing number of abdominal surgeries. Up to 60–70% of instances of SBO can be attributed to adhesions **(Gowthaman et al., 2021)**. Mortality rates for acute SBO range from 3% for simple obstruction, and with luminal necrosis or perforation exposing the patient to a possible fatal outcome, it can be as high as 30% **(Eren et al., 2015)**. Adhesions may even form a tight constricting band around the bowel, leading in time to complete transection and formation of two blind loops **(Atif, 2019)**.

The mechanical SBO following a constriction band and subsequent necrosis of the herniated part in a patient with no previous abdominal surgery is rare and only a handful of cases are reported **(Loganathan et al., 2021, Sinwar, 2015)**. Despite the availability and wide use of modern imaging techniques, preoperative diagnosis is very difficult to establish. This entity is uncommon, especially in adult population, many cases are reported of a congenital constriction band formation causing of SBO in children **(Erginel et al., 2016, Akgür al., 1992, Habib & Elhadad, 2003)**.

A detailed history, including history of prior surgeries and thorough physical examination are paramount to the diagnosis of bowel obstruction. Acute SBO is commonly a diagnosis of exclusion. Symptoms of SBO include nausea, vomiting, bloating, crampy, colicky abdominal pain, with minimal or complete absence of flatus and bowel movements **(Aka et al., 2021, Taylor & Lalani, 2013)**. A plain abdominal X-Ray and Ultrasonography are usually required as an initial investigation modality which can demonstrate the distension of an intestinal loop. Subsequently, a Computed Tomography (CT) Scan can be done to determine the location, severity, and etiology of the SBO **(Gowthaman et al., 2021, Aka et al., 2021, Taylor & Lalani, 2013)**. A CT scan is useful for differentiating SBO caused by adhesive bands from SBO due to matted adhesions **(Delabrousse et al., 2009**). The prompt diagnosis and surgical intervention prevents potential complications like strangulation, ischemia, gangrene, and perforation of the herniated part of small intestine and possible subsequent peritonitis. Excision of the constriction band and *sos* resection and anastomosis of intestine are adequate **(Erginel et al., 2016)**. Though the constriction band formation is rare, it should still be suspected as an etiology in patients without prior abdominal surgery **(Loganathan et al., 2021)**.

The scarcity of doctors in rural areas, lack of sensitization regarding when to seek expert medical care in emergency and the healthcare expenditure per capita may be the factors for neglect of one's own health needs and resorting to self-medication. Though the debate is discussed in detail regarding the classic surgical dilemma of "never let the sun set on small bowel obstruction" **(Aka et al., 2021)**, if the patient did not let the sun set for a surgical consultation, the outcome would have been favourable.

Conflict of interest

The authors declare that they have no competing interests.

Funding

None.

Ethics approval and consent

The study was conducted according to the declaration of the Helsinki. The requirement for ethical review was waived by the Institutional Ethics Committee of our affiliated institution. Written informed consent was obtained from the victim's family for both the study and the publication of this case report.

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