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Case Report

Isolated tubal ischemia secondary to small bowel volvulus: a rare case report

Marouane Boukroute*, Abdelmajide Regragui, Zaineb Chatbi, Ibtissam Bellajdel, Hafsa Taheri, Hanane Saadi, Ahmed Mimouni

Department of Obstetrics and Gynecology, Mohammed VI University Hospital Center, Oujda, Morocco

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***Correspondence:**
Dr. Marouane Boukroute,
E-mail: marouaneboukroute4@gmail.com

ABSTRACT

Torsion of the fallopian tube is a rare cause of acute abdominal pain, often underrecognized in the context of intestinal pathology. We reported the case of a 30-year-old woman who developed isolated fallopian tube ischemia secondary to small bowel volvulus, a complication rarely described. She presented with acute hypogastric pain, vomiting, and mild left hydronephrosis. CT imaging revealed a small bowel obstruction with a whirlpool sign but no apparent tubal abnormalities. Laparotomy identified a twisted, ischemic fallopian tube with hydrosalpinx, attributed to adhesions from a recent appendectomy. Salpingectomy, small bowel resection, and anastomosis were performed, with histopathology confirming ischemic necrosis. This case underscores the diagnostic challenge posed by overlapping gastrointestinal and gynecological emergencies and suggests that vascular compromise in small bowel volvulus may extend to pelvic structures. Given the rarity of secondary tubal torsion, clinicians should consider this possibility in women with prior pelvic surgery and acute abdominal pain. Early CT imaging and interdisciplinary collaboration are essential for timely intervention and improved outcomes.

Keywords: Fallopian tube ischemia, Secondary tubal torsion, Small bowel volvulus, Post-appendectomy adhesions, Gynecologic emergency, Acute abdomen in women

INTRODUCTION

Ovarian torsion is an uncommon but serious gynecological emergency, accounting for approximately 2.7% of acute pelvic pain cases in women and often leading to delayed diagnosis due to its nonspecific presentation.[1] We reported the case of a 30-year-old woman presenting with acute abdominal pain, where CT imaging revealed a small bowel volvulus. During exploratory laparotomy, isolated fallopian tube ischemia caused by the bowel torsion was discovered-an association not previously described in the literature. This rare presentation underscores the complex anatomical relationship between gastrointestinal and gynecologic organs, where torsion or ischemia of adnexal structures can occur as secondary complications.[2] Adhesions from previous surgeries are recognized contributors to such events, by distorting normal pelvic anatomy and predisposing to both bowel and tubal torsion.[3] A high index of suspicion and timely multidisciplinary intervention remain essential to avoid misdiagnosis and improve patient outcomes.[4]

CASE REPORT

A 30-year-old married woman, G1P1, who underwent an appendectomy two months prior with a negative histopathological result, was admitted to the emergency department for acute hypogastric pain. The patient's symptoms began two days prior with the onset of hypogastric abdominal pain accompanied by vomiting. An abdominal ultrasound revealed mild left hydronephrosis

associated with papillary ectasia, all occurring in the context of afebrility and general malaise.

Clinical examination found the patient conscious and hemodynamically stable with a blood pressure of 120/78 mmHg, a heart rate of 78 bpm, and a respiratory rate of 16 cpm, classified as WHO grade 0. Abdominal examination showed McBurney's scar and a drainage scar in the right iliac fossa. The abdomen was soft with slight hypogastric and peri-umbilical tenderness. Digital rectal examination revealed a full ampulla, and bowel transit was preserved.

Laboratory findings included negative infection workup WBC: 12,580 /mm^3, CRP: 2 mg/l, and negative urine culture; normal blood cell count: hemoglobin: 12.1 g/dl, platelets: 384,000 /mm^3; renal function was correct, urea: 0.27, creatinine: 6.93; negative β-hCG: 1.2.

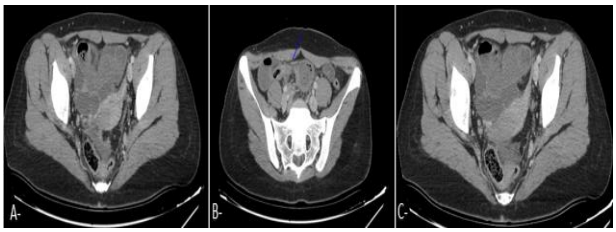

Figure 1: CT scan showing (A) the uterus, left fallopian tube, and left ovary appeared normal, with no anomalies detected. The right fallopian tube was not visualized; (B) the organic small bowel obstruction identified upstream of a whirlpool sign (blue arrow) in the hypogastric region, indicative of a small bowel volvulus; (C) visible right ovary, absence of visualization of the right fallopian tube.

Figure 2: Intraoperative images depicting (A) small bowel volvulus with extensive bowel necrosis (white arrow), and (B) ischemia and necrosis of the fallopian tube (red asterisk) with viable ovarian tissue.

A contrast-enhanced abdominal-pelvic CT scan indicated an organic small bowel obstruction proximal to a whirlpool sign in the hypogastric region, consistent with small bowel volvulus associated with minimal ascites; the uterus, left tube and ovary were without abnormalities, no visualization of the right tube (Figure 1).

After providing supportive care, including fluid resuscitation, antibiotics, and pain management, the patient was admitted for an emergency laparotomy with a presumptive diagnosis of bowel volvulus. Intraoperatively, an ischemic, twisted fallopian tube with hydrosalpinx was discovered. The fallopian tube was found to be twisted twice and non-viable (necrotic), particularly at the distal end (fimbriae and ampulla) (Figure 2). Upon consultation with the obstetrics and gynecology team, a decision was made to perform a salpingectomy. The torsion was attributed to an adhesion. Extensive adhesions, resulting from prior surgery, led to small bowel obstruction. This was managed with adhesiolysis; however, the severity of intestinal damage required resection followed by primary ileal anastomosis. The postoperative course was uneventful, and the patient was discharged five days post-surgery.

Table 1: Imagery signs of bowel volvulus and ovarian tubes ischemia.

Type of imagery	Signs of bowel volvulus	Signs of the ovarian tubes ischemia
Abdominal radiography	Dilated bowel loops presenting with a distinctive "spiral nebula" pattern in the midabdomen.	Distended Fallopian tube
Ultrasound	Whirlpool sign (pathognomonic)	Enlarged edematous globular ovary; Stromal hypoechogenicity (edema) or patchy hyperechogenicity (hemorrhage); Little or no ovarian venous flow (sensitivity of 100% and specificity of 97%)
CT scan	Whirlpool sign (direct sign); The ‘beak’ sign; The presence of gas indicating infarction (indirect sign)	Edematous or hemorrhagic mass anterior or posterior to the uterus (which may be tilted), with patchy enhancement and adjacent free fluid

DISCUSSION

A volvulus refers to the torsion of a segment of the gastrointestinal tract around its mesenteric axis. This

twisting can lead to either complete or partial obstruction of the affected bowel segment, often accompanied by compromised arterial or venous blood flow. Volvulus primarily affects the sigmoid colon, cecum, and stomach, with less frequent involvement of the transverse colon. In adults, small bowel volvulus is uncommon, reviewing the literature only few cases were reported, cited in less than 7% of all bowel obstruction and from 3-6% in the western world.[5-9] However, the incidence of small bowel volvulus is notably higher in countries in the Middle East, Asia, and Africa. This variation may be linked to specific dietary habits, particularly the consumption of high-fiber foods following extended periods of fasting, such as those observed during the month of Ramadan such in Morocco as well as genetic predispositions and differences in surgical practices.[5] It is a surgical emergency, so in the event of delayed diagnosis, the consequences can be major, ranging from septic shock to life-threatening associated to high mortality. Moreover, vascular compromise in small bowel volvulus can extend to nearby pelvic structures due to shared mesenteric circulation, as hypothesized in our case.

Small bowel volvulus can be attributed to either primary (in the absence of anatomical defects) or secondary causes. Additional etiological factors include congenital malrotation, Meckel's diverticulum, mesenteric leiomyomas, and malignancy.[6,9-11] On rare occasions, small bowel volvulus may also be induced by Ascaris infestation.[12] Thus, previous studies on tubal torsion have mainly focused on primary cases without an associated bowel pathology. Our case introduces a secondary mechanism of tubal ischemia that may go underrecognized in acute surgical settings.

The clinical manifestations of small bowel volvulus may encompass various symptoms, including severe abdominal pain, usually periumbilical or epigastric and which may occur after ingestion of a meal, often sudden and intense, abdominal distension, nausea and vomiting, absence of passage of gas or stool, abdominal tenderness upon palpation, tachycardia, and, in severe cases of vascular strangulation, signs of shock such as pallor, arterial hypotension, and altered consciousness.[13,14] Furthermore, the intensity of abdominal pain correlates directly with the duration of vascular compromise, while displaying no correlation with the extent of intestinal obstruction.[2] These signs may be confused with those of ischemia of the ovarian tube, which may or may not be associated with fever or leucorrhoea, and vaginal bleeding making the diagnosis more challenging and underscores the crucial role of imaging.

Reviewing the literature, we could identify the most frequent signs of bowel volvulus and those of the ovarian tube ischemia (Table 1).[15,16]

Histopathological findings in tubal ischemia secondary to bowel volvulus have not been extensively reported. Our case contributes to the understanding of ischemic patterns in secondary tubal torsion, reinforcing the need for tissue examination in similar cases.

The treatment of this pathology remains surgical approach, with an emergency laparoscopy performed in the early disease course, in which the isolated torsion of the fallopian tube could be relieved, and to rescue the tube. However, in the aspect of persistent ischemia changes in the delayed presentation, Salpingectomy is (to be) performed as an inevitable surgical procedure. The post-operative recovery is faster; the length of hospital stay is shorter; and there are fewer pelvic adhesions than with laparotomy.[17] Given the complexity of this case, early recognition of bowel volvulus in women with prior pelvic surgery could lead to preemptive gynecological assessment, potentially preserving tubal function.

CONCLUSION

In patients exhibiting an enlarged ovary or with a history of pelvic surgery, suspicion for torsion should be heightened. Small bowel volvulus, though infrequent, warrants consideration in patients experiencing the abrupt onset of acute abdominal pain. In instances of small bowel volvulus, it is imperative to contemplate fallopian tube ischemia, necessitating the performance of a contrast-enhanced CT scan to ascertain the diminishment of vascular perfusion.

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