# TORSION AND NECROSIS OF THE FAT ATTACHMENT OF THE LARGE INTESTINE WITH TRANSLOCATION OF INTERNAL ORGANS (A CASE FROM PRACTICE)

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***ANNOTATION****: Diseases of the fatty pendants of the colon (torsion, inflammation, necrosis) are rare and account for 0.1–0.3% of acute diseases of the abdominal organs. Transposition of internal organs (situs inversus viscerum) is a rare variant of biologically normal anatomy, occurring no more often than 1 in 10 thousand people. The diagnosis of torsion and necrosis of fatty pendants of the colon is most often established intraoperatively during laparoscopy or laparotomy, the indications for which, as a rule, are other diseases of the abdominal cavity and pelvic organs. This article presents a clinical case of a patient with torsion and necrosis of the fatty pendant of the colon during transposition of internal organs.*

***Key words:*** *fat suspension of the colon, transposition of internal organs, laparoscopy.*

**Introduction:** It has been approximately 470 years since A. Vesalius described the fat appendages of the colon (epiploic appendices) in 1543 [1, 2]. In foreign literature, these structures are referred to as "epiploic appendix," "apparcil sero-gras-sieux," "adipose appendages," and "sero-appendices" [1]. According to anatomical sources, they are described as small physiological peritoneal fat pouches attached to the outer surface of the colon by vascular stems. Typically, these appendices are 1–2 cm thick and 0.5–5 cm long, but in some cases, they can reach up to 15 cm, increasing in size distally from the cecum to the sigmoid colon. Each appendix is supplied with one or two small terminal arteries of the colon and

a small vein [10]. Diseases of these appendices (torsion, inflammation, necrosis) are rare, accounting for 0.1–0.3% of acute abdominal diseases [2, 5, 6].

Transposition of internal organs (situs inversus viscerum) is a rare variant of biologically normal anatomy where the major internal organs are mirrored compared to their usual positions: the heart is on the right side, the liver is on the left, and the stomach is on the right. The prevalence of situs inversus varies among different populations but occurs in no more than 1 in 10,000 people [2, 4].

In 1600, Fabricius reported the first known case of reversed liver and spleen in a human. In 1897, Wechsler first demonstrated organ transposition using X-rays [8, 9]. This unusual anatomy presents challenges in diagnosing and treating diseases [11]. According to some authors, among 71 patients operated on for colon epiploic appendix torsion, 15 cases were found in the cecum, 2 in the appendix, and 54 in the ascending and sigmoid colon [7].

The rarity of the disease and the lack of prominent clinical signs often complicate diagnosis and lead to diagnostic errors. Factors complicating the preoperative diagnosis of torsion and necrosis of the appendices include the absence of specific laboratory changes and limited non-invasive diagnostic capabilities, such as ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI). Therefore, laparoscopy plays a crucial role in diagnosing epiploic appendix diseases. The diagnostic value of laparoscopy in torsion and necrosis of the appendices is quite high, allowing diagnosis verification in 83–100% of cases [1, 2, 5, 6].

The diagnosis of torsion and necrosis of the epiploic appendices is most often made intraoperatively during laparoscopy or laparotomy, usually indicated for other abdominal and pelvic diseases. Postoperative complications in torsion and necrosis of the appendices occur in 7.6–17.3% of cases, with a mortality rate reaching 1.6% according to some authors [2, 5, 6]. Therefore, a diagnosis based solely on clinical manifestations can lead to errors and requires additional objective information. Ultrasound, X-ray, irrigoscopy, colonoscopy, and CT are not sufficiently informative for epiploic appendix diseases [2, 5, 6, 7].

In the literature we reviewed, there are only a few reports on torsion and necrosis of the epiploic appendices in patients with situs inversus. Similarly, there are limited reports of colon pathologies associated with organ transposition [2, 3].

**Objective of the Study:** Presentation of a clinical case involving the treatment of a patient with torsion and necrosis of the epiploic appendices in the context of situs inversus.

**Materials and Methods:**A patient presented to the emergency department surgeon with complaints of pain in the right and left iliac regions, nausea, vomiting, and general weakness. According to the patient, they have been ill for the past three days, experiencing this type of pain for the first time. The pain initially occurred in the right iliac region and subsequently spread to the left iliac region and around the navel. The patient reported nausea with vomiting, dry mouth, and weakness. At home, they took antispasmodic tablets, which provided short-term relief. However, the abdominal pain, dry mouth, and general weakness intensified, prompting the visit to the hospital. The patient has had situs inversus since childhood. They grew and developed normally according to their age. Previous illnesses included childhood infections and acute respiratory viral infections.

**Objective Condition:** The patient's condition is of moderate severity. The patient is conscious and alert. Body temperature is 36.9°C. The skin and visible mucous membranes are of normal color. Peripheral lymph nodes are not enlarged. The musculoskeletal system shows no pathology. The patient is of normal build. Breathing is free and spontaneous, with a respiratory rate of 18 breaths per minute. Vesicular breath sounds are present and conducted in all areas. The heart borders are located in the right side of the chest. Heart sounds are clear and rhythmic, with no murmurs detected. The pulse is 92 beats per minute. Blood pressure is 120/80 mmHg. The tongue is slightly dry, coated with a white film. The abdomen is not distended and is symmetrical; it is soft upon palpation but painful in the right and left iliac regions and around the navel. The liver is located on the left, and the spleen is on the right, both not enlarged. Hepatic dullness is preserved, and there

are no dull percussion sounds in the dependent parts of the abdomen. Rovsing's, Sitkovsky's, and localized Shchetkin-Blumberg's signs are positive. Bowel peristalsis is audible upon auscultation. Bowel movements and urination are not impaired.

**Examination Results:**

- Complete Blood Count: Hemoglobin – 132 g/L, Red Blood Cells – 4.5 million, White Blood Cells – 8.3 thousand.
- Urinalysis and biochemical blood tests show no abnormalities.
- ECG: Dextrocardia, sinus rhythm, heart rate of 94 beats per minute.
- Chest and abdominal X-ray: The chest is of normal configuration, and the soft tissues show no peculiarities. Complete inversion of internal organs is observed, with the heart positioned on the right. Lung fields are fully expanded without focal or infiltrative shadows. The lung pattern is unremarkable, with bronchial walls highlighted. The lung roots are not enlarged, minimally structured, and condensed. The mediastinum is not displaced. The heart shadow is located on the right, not enlarged, and of normal configuration. Pleural sinuses are clear. The diaphragm domes are in a normal position. The gastric air bubble is located on the right (see Fig. 1).


Figure 1. Chest X-ray.

**On Chest and Abdominal MSCT:** The organs of the chest and abdomen are reversed: the heart, aorta, stomach, spleen, and tail and body of the pancreas are on the right; the liver, gallbladder, head of the pancreas, and inferior vena cava are on the left. The shape, size, and structure of the organs are unchanged. The

lymph nodes of the abdominal cavity and retroperitoneal space are not enlarged (see Figs. 2 and 3).

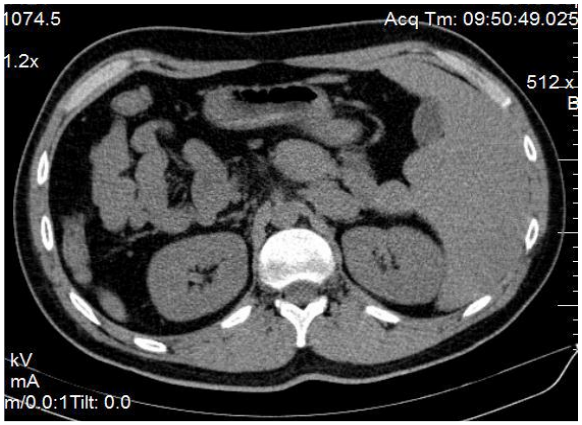


Figure 2. MSCT of the Abdominal Organs and Retroperitoneal Space.


Figure 3. MSCT of the Abdominal Organs.

A preliminary diagnosis was established: Acute appendicitis. Situs inversus viscerum (SIV). Emergency surgery was recommended. Before the operation, the patient was examined by a therapist and an anesthesiologist. Two hours after being admitted to the hospital, an operation was performed under endotracheal anesthesia: Diagnostic laparoscopy, removal of the necrotized epiploic appendage of the sigmoid colon, and drainage of the abdominal cavity. During the laparoscopic revision, it was found that the abdominal organs were transposed. Up to 30 ml of clear effusion without pathological admixtures was detected in the pelvic cavity. The parietal and visceral peritoneum in all sections were unchanged. The abdominal organs—liver, gallbladder, and duodenum—were located on the left, with no pathological changes detected. The stomach and spleen were located on the right, also without pathological changes. The round ligament of the liver was not thickened or edematous. The loops of the small

intestine were not dilated, their surface was pink, peristalsis was present, and the mesentery was unchanged. The entire length of the large intestine was examined and found to be moderately dilated, with a gray-pink surface. The dome of the cecum and the appendix were located in the left iliac region. The appendix was located medially, 8 cm in length, and unchanged. Further revision revealed that the sigmoid colon was located in the right iliac region, with a 3.0 x 2.5 x 0.8 cm epiploic appendage on its anterior wall. The appendage was of dense consistency, black in color, twisted 360° clockwise at the base, and attached to the intestinal wall on a stalk (see Fig. 4).

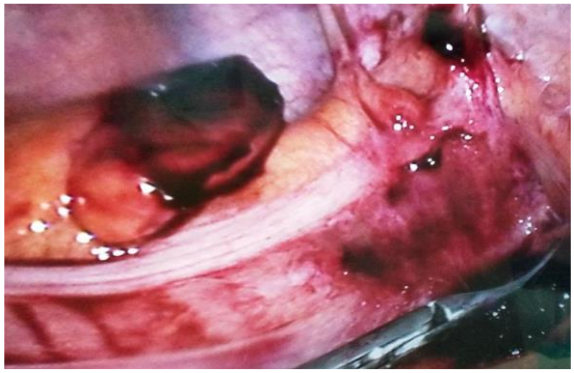

Figure 4. Intraoperative Torsion and Necrosis of the Epiploic Appendage of the Colon.

Based on the revision, an intraoperative diagnosis was established: Torsion and necrosis of the epiploic appendage of the colon. Situs inversus viscerum (SIV). Considering the above, the necrotized epiploic appendage was removed. The pedicle of the epiploic appendage was isolated from the wall of the sigmoid colon, ligated, and transected. The wall of the cecum in the area of the epiploic appendage was slightly infiltrated. The removed epiploic appendage was extracted through a trocar in the left iliac region. The right and left iliac regions were dried. The small pelvis was drained through a contraparture (existing puncture) in the right iliac region. Layered sutures were applied to the wound. An aseptic alcohol dressing was used.

Histological conclusion: No. 3721-25 pieces of adipose tissue with areas of necrosis, hemorrhages, and fibrosis. The postoperative period was smooth. Infusion, antibacterial, and analgesic therapy were administered. The abdominal

drainage was removed on the third day after the operation. The postoperative wound showed no signs of inflammation. The patient was discharged in satisfactory condition for further outpatient treatment by a surgeon at their place of residence.

**Conclusions:** The rare occurrence of the combination of acute surgical pathologies with situs inversus viscerum (SIV) underscores the importance of studying the clinical features and the potential of various diagnostic methods for this pathology. In cases of combined diseases of the colon with SIV, laparoscopic intervention is the primary method for establishing an accurate diagnosis and providing appropriate treatment.

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