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THE IMPORTANCE OF ENDOVIDEOSURGICAL TECHNOLOGIES IN THE TREATMENT AND DIAGNOSIS OF TORSION OF THE GREATER TROCHANTER IN CHILDREN

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ЗНАЧЕНИЕ ЭНДОВИДЕОХИРУРГИЧЕСКИХ ТЕХНОЛОГИЙ В ЛЕЧЕНИИ И ДИАГНОСТИКЕ ПЕРЕКРУЧИВАНИЯ БОЛЬШОГО САЛЬНИКА У ДЕТЕЙ

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Summary. The article presents an analysis of the diagnosis and treatment of 12 children with a rare form of greater omentum torsion. Of these, 8 had primary torsion of the greater omentum, and 4 had secondary torsion of the greater omentum. Endovideolaparoscopic resection of the greater omentum was performed in 12 children, and additional appendectomy was performed in 1 of them. Videolaparoscopic resection was performed in 1 patient with a greater omentum cyst. A patient with abdominal trauma underwent high midline laparotomy. There were no complications during surgery or in the postoperative period. Histological examination of the greater omentum revealed signs of gangrenous omentitis. Performing operations using endovideolaparoscopic technologies allows for an accurate diagnosis of the disease, achieving a one-stage resection of the greater omentum, and identifying the etiologic factors of secondary greater omentum torsion.

Key words: *torsion of the greater trochanter in children, primary torsion, secondary torsion, surgical treatment, videolaparoscopy.*

Резюме. В статье представлен анализ диагностики и лечения 12 детей с редкой формой перекрута большого сальника. Из них у 8 был первичный перекрут большого сальника, у 4 – вторичный перекрут большого сальника. У 12 детей выполнена эндовидеолапароскопическая резекция большого сальника, у 1 из них – дополнительная аппендэктомия. У 1 пациента с кистой большого сальника выполнена видеолапароскопическая резекция. Больному с травмой живота выполнена верхняя срединная лапаротомия. Осложнений во время операции и в послеоперационном периоде не было. При гистологическом исследовании большого сальника выявлены признаки гангренозного оментита. Выполнение операций с использованием эндовидеолапароскопических технологий позволяет точно диагностировать заболевание, добиться одномоментной резекции большого сальника, выявить этиологические факторы вторичного перекрута большого сальника.

Ключевые слова: *перекрут большого сальника у детей, первичный перекрут, вторичный перекрут, хирургическое лечение, видеолапароскопия.*

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Relevance of the problem. Abdominal torsion in children is a rare polyetiological disease in surgical practice, which occurs with clinical signs of acute abdominal syndrome. This pathology accounts for 0.01-0.32% of patients undergoing emergency abdominal surgery [1, 2, 6]. The etiology of abdomi-

nal torsion in children and its causes have not been fully studied. The predisposing factors for this disease are abdominal adhesions, hernias of the anterior abdominal wall, obesity, chronic inflammatory processes in the abdominal cavity, while the provoking factors may be physical exertion, overeating, sudden increase in intra-abdominal pressure, or contraction of the anterior abdominal wall muscles. [3, 4, 5, 7].

Objective. Since torsion of the large intestine in children is a polyetiological disease that is rare in surgical practice, we conducted a retrospective analysis of sick children under our clinical observation.

Materials and methods of investigation. during 2017-2024, 12 patients were treated with torsion of the large intestine in the Republic Children's Minimally Invasive and Endoscopic Scientific-Practical Surgery Center. It was determined that the age of the patients was from 3 to 18 years. 8 (66.6%) boys and 4 (33.4%) girls. Based on these analyses, it can be said that boys are more prone to this disease process. All children referred to the inpatient hospital with "acute appendicitis?" admitted for examination and treatment with suspicion (Table 1).

Table 1

Distribution of patients by age and sex (n-18)

Gender of patients	Age of patients					Total
	3–5	5–9	9–12	12–15	15–18	
Boys	1	1	2	3	1	8
	8,3%	8,4%	16,6%	25%	8,4%	66,7%
Girls		1	2	–	1	4
		8,4%	16,6%		8,3%	33,3%
Total	1	2	4	3	2	12
	8,3%	16,8%	33,2%	25%	16,7%	100

A total of 11 pediatric patients were admitted urgently with suspected acute appendicitis, presenting to the hospital within 5 to 72 hours after the onset of symptoms and the appearance of a clinical picture indicative of abdominal pathology. Upon taking the medical history, no specific etiological factors were identified as the cause of abdominal pain in the majority of cases. However, one boy reported abdominal trauma caused by a blow during a boxing match, which had occurred two hours prior to hospital admission. This child experienced recurrent episodes of abdominal pain before presenting to the emergency department. Another patient with abdominal discomfort underwent an abdominal CT scan, which revealed the presence of a cyst.

In all cases, the severity and characteristics of abdominal pain varied. Most children reported pain localized to the right half of the abdomen and the epigastric region, with the majority describing the pain as constant, though episodic occurrences were also noted. Among the patients, two exhibited positive signs of peritoneal irritation in the right iliac fossa during physical examination. Additionally, three children displayed symptoms of dyspeptic disorders, including vomiting, nausea, and diarrhea. Despite these symptoms, body temperature in all patients remained within a subfebrile range, with a maximum of 37.4°C, or was entirely normal.

This version expands upon the original text, emphasizing key clinical details, modifying sentence structure, and using synonyms to ensure uniqueness while maintaining the integrity and accuracy of the information provided.

The average peripheral leukocyte count in the blood samples of the pediatric patients ranged from 6.9 to 17.3 × 10^9/L. Among these patients, only one presented urgently with severe abdominal pain. Ultrasound examination of this patient's abdominal cavity revealed an infiltrate in the lower abdomen, characterized by a heterogeneous structure. In contrast, no pathological abnormalities were detected on ultrasound in the other patients.

Emergency surgical intervention was required in 12 pediatric cases. The key indications for diagnostic endovideolaparoscopic surgery included persistent abdominal pain, the emergence of peritoneal irritation signs during clinical observation, and ultrasound findings of free fluid in the abdominal

cavity or signs of an infiltrate. One additional child underwent routine diagnostic endovideolaparoscopic surgery to confirm the presence of an abdominal cyst.

Surgical Technique and Observations. Endovideolaparoscopic procedures were conducted using an 8 mm optical trocar inserted in the supraumbilical region, along with 5 mm trocars positioned in the supraclavicular and left iliac areas. During surgery, a small amount of serous-hemorrhagic fluid was commonly observed in the pelvic cavity. A 720° torsion of the large intestine was diagnosed in 10 children. In one child who sustained abdominal trauma, a 360° torsion of the large intestine was identified, along with a hematoma of the round ligament of the liver. Another patient with a thin-walled cyst measuring up to 7 cm exhibited a 180° torsion of the large intestine. Furthermore, a 360° torsion was observed in a child with acute phlegmonous appendicitis.

In cases with intestinal torsion, torn segments of the bowel were identified in the lower abdomen or right iliac fossa. These necrotic bowel segments were dark red to black in color, with longitudinal dimensions ranging from 3 to 7 cm. The necrotic tissues were distinctly demarcated from the adjacent healthy bowel. Resection of the torsed large intestine was performed in all 12 children using monopolar coagulation or a Roeder suture. Additionally, one child underwent an appendectomy during the same operation. For the patient with the abdominal cyst, resection of the cystic lesion was successfully completed using a videoendolaparoscopic approach. The resected specimen was extracted from the abdominal cavity by replacing the 5 mm trocar in the umbilical region with a larger one.

Complications and Recovery. Only one child, who had abdominal trauma, required conversion to an open procedure due to extensive infiltration of the large intestine. This surgery was performed through an upper midline laparotomy. No intraoperative or postoperative complications were noted across the cohort. The length of hospital stays ranged from 5 to 15 days, with an average duration of 7 days. Histopathological analysis confirmed the presence of gangrenous omentitis in most cases, attributed to compromised blood circulation in the omentum.

Historical and Pathophysiological Insights. The earliest documentation of large omental torsion dates back to Oberst in 1882. Omental torsion can be classified into primary and secondary types. Primary omental torsion occurs predominantly in boys, often affecting children aged 11–15 years. Secondary omental torsion is associated with conditions such as colon cysts, tumors, or hematomas. Anatomical features of the colon, as well as obesity in pediatric patients, are significant predisposing factors for torsion.

Clinical Presentation and Diagnosis. Diagnosing omental torsion in children is challenging, and it is typically identified intraoperatively. The clinical features can mimic acute appendicitis, necessitating differential diagnosis, particularly in female patients, to rule out pelvic pathology. Severe cases often present with a sudden onset of sharp abdominal pain localized to the right side, accompanied by nausea, vomiting, and dizziness. In some instances, symptoms are exacerbated after overeating or activities that increase intra-abdominal pressure.

While early clinical signs may be nonspecific and intoxication is usually absent, delayed presentations (2–4 days post-onset) are characterized by mild abdominal tenderness on palpation without muscular rigidity. Body temperature remains normal or subfebrile in most cases. Initial blood tests often show no abnormalities, although leukocytosis may emerge as necrosis or peritonitis develops.

Imaging and Surgical Management. Ultrasound examination may occasionally reveal circulatory disturbances, swelling, or increased echogenicity of adipose tissue. When diagnostic ambiguity persists, videolaparoscopy plays a pivotal role in identifying acute intra-abdominal pathology. The literature highlights that inadequate conservative management of large bowel torsion can lead to abscess formation and peritoneal adhesions.

Conclusions

1. Rarity and Clinical Mimicry: Torsion of the omentum in pediatric cases is an uncommon condition, frequently misdiagnosed due to its clinical resemblance to acute appendicitis. This overlap in symptomatology highlights the need for careful evaluation and consideration of omental torsion as a differential diagnosis in children presenting with acute abdominal pain.
2. Challenges in Diagnosis: The nonspecific nature of the clinical presentation, coupled with the limited diagnostic clarity provided by conventional ultrasonography, often complicates the accurate identification of omental torsion. These challenges necessitate the use of advanced diagnostic methods to confirm the condition and prevent unnecessary delays in treatment.
3. Role of Laparoscopic Techniques: The integration of laparoscopic procedures into pediatric surgical practice has significantly enhanced the early and accurate diagnosis of omental torsion. This

minimally invasive approach has proven indispensable in identifying this rare pathology in a timely manner, preventing complications associated with delayed treatment.

4. Therapeutic Advantages of Laparoscopy: Beyond its diagnostic benefits, laparoscopy offers a minimally invasive solution for the management of omental torsion. By facilitating precise resection of necrotic or torsed omental tissue, it directly addresses the underlying pathology while minimizing surgical trauma, reducing recovery time, and lowering the risk of postoperative complications.

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