

# Optimizing the Management of Acute Adhesive Intestinal Obstruction in Children: A Retrospective Analysis of Surgical and Conservative Approaches

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**Abstract** The article presents the experience of comprehensive treatment of children with adhesive disease of the abdominal cavity. It is based on the results of examination and treatment of patients with postoperative adhesive complications in the abdominal cavity, drawn from 195 cases treated at the clinic from 2023 to 2025. The patients' ages ranged from 3 months to 18 years. A total of 152 (77.9%) patients were hospitalized once, 28 (14.3%) patients were hospitalized twice, and 12 (6.1%) patients were hospitalized 3 to 11 times. Of these, 29 (14.8%) had evident intra-abdominal adhesions and, to facilitate completion of a full videoendolaparoscopic adhesiolysis, received a preoperative intraperitoneal injection of a centrally prepared fibrinolytic mixture (composition: heparin 10,000 IU + fibrinolysin 20,000 IU + hydrocortisone 125 mg + gentamicin 80 mg + novocaine 0.25% – 200 mL) followed by protocolized therapeutic procedures. No postoperative complications or recurrence were observed. With the use of endovideolaparoscopic technology, all operated patients were mobilized early and had an average hospital stay of 3.7 days.

**Keywords** Abdominal adhesive disease, Children, Prevention, Videolaparoscopic adhesiolysis

## 1. Introduction

Acute adhesive intestinal obstruction (AAIO) is one of the complex issues in emergency abdominal surgery. According to various data, AAIO accounts for between 2.6% and 9.4% of all acute surgical abdominal conditions [1]. In recent years, contrary to expectations, there has been a rising trend in the incidence of this pathology [2] [1]. The number of patients with intestinal obstruction of neoplastic genesis is increasing each year. Against the background of a decrease in manifest forms of intestinal obstruction (volvulus, intussusception, etc.), the frequency of adhesive obstructions has significantly increased. This is often associated with patients' late presentation to medical facilities and an increase in diagnostic errors at all stages of care for this category of patients [1] [3]. Acute mechanical intestinal obstruction, as a rule, requires prompt observation and treatment; thus, it is traditionally classified as a "clinical" pathology [3]. Emergency surgery remains the main method of treating patients with AAIO; however, the high rate of mortality and postoperative complications

forces physicians to seek alternative treatment methods [4]. In the diagnosis of AAIO, an urgent surgical intervention is typically the first consideration. Early surgical doctrine held that "a patient with ileus must be operated on before the sun sets or before it rises on them" – in other words, within a few hours of onset. Today, surgery for acute mechanical AAIO is recognized as the only radical treatment. One of the leading figures in abdominal surgery, the Hungarian surgeon Imre Litter ái (Littmann), stated metaphorically in the 1970s: "...even the most advanced multicomponent drug therapy aimed at restoring water-salt balance cannot bring such relief to a patient with intestinal obstruction as cutting just one constricting adhesion with the surgeon's finger and surgical instrument" [5]. This empirically accepted scientific concept remains relevant and pressing to this day.

**Aim of the Study:** To analyze the diagnosis, treatment, and complications in pediatric patients with adhesive disease of the abdominal cavity (postoperative intra-abdominal adhesions and their consequences).

## 2. Materials and Methods

This study is based on the examination and treatment results of 195 pediatric patients with adhesive complications in the abdominal cavity following surgical interventions,

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who were treated in our clinic from 2023 through 2025. The patients' ages ranged from 3 months to 18 years. Of the total, 152 (77.9%) patients were admitted to the hospital once, 28 (14.3%) patients were admitted twice, and 12 (6.1%) patients were hospitalized between 3 and 11 times.

All patients who developed abdominal pain syndrome after previous abdominal surgeries underwent standard clinical examinations, as well as abdominal ultrasonography. If ultrasound examination did not reveal clear signs of an adhesion process, additional instrumental and laboratory investigations were performed to determine the cause of the pain syndrome. These included plain abdominal radiography, contrast study of gastrointestinal passage, irrigography, fibrogastroduodenoscopy (FGDS), excretory urography, computed tomography (CT), and other relevant tests as needed.

### 3. Results and Discussion

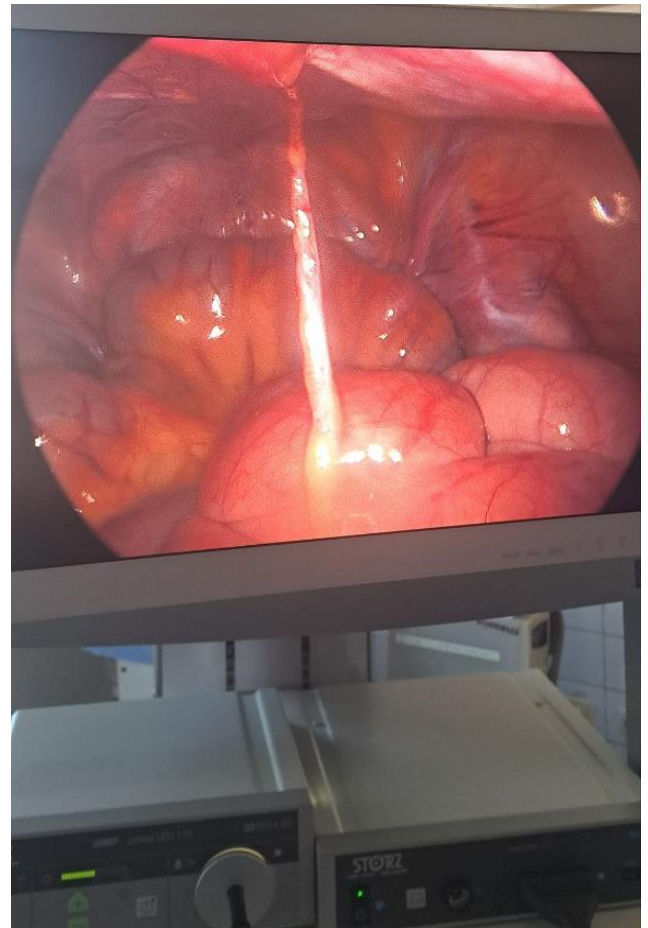


**Figure 1.** Patient I.A., 11 years old, diagnosis: AAIO. Diagnostic abdominal radiograph

Among the 195 patients with adhesive disease of the abdominal cavity in our series, 29 (14.8%) underwent planned laparoscopic adhesiolysis. Conversion to open surgery was required in 10 cases (5.1%), and the remaining 156 patients (80%) were managed with conservative therapy. If an alternate pathology was identified as the cause of symptoms, patients were referred to the appropriate specialists (gastroenterologist, nephrologist, etc.). For patients in whom ultrasound examination confirmed the presence of adhesions, the treatment strategy depended on the severity of the pain syndrome and the patient's medical history. In cases of mild

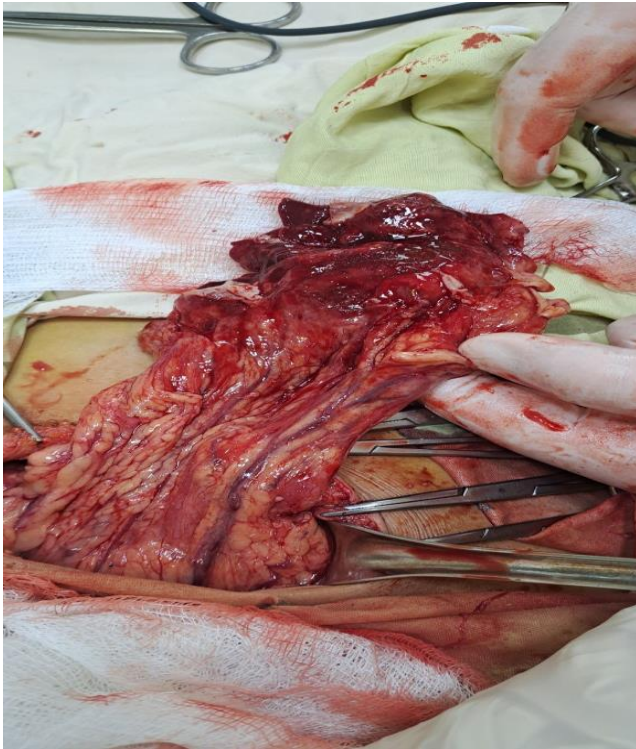
to moderate pain, a full course of anti-adhesion (conservative) therapy was prescribed, followed by a repeat ultrasound evaluation. Patients with severe pain syndrome, as well as those who had experienced an episode of adhesive intestinal obstruction within the last three months, received a course of anti-adhesion therapy conducted in parallel with preparation for elective surgery.

After the first course of anti-adhesion therapy, a follow-up abdominal ultrasound was performed. If the abdominal pain had resolved and the sonographic signs of adhesions were absent, patients were discharged for outpatient follow-up. These patients were advised to adhere to a diet and were monitored for 3–5 years, with abdominal ultrasound check-ups once every 6 months [6].

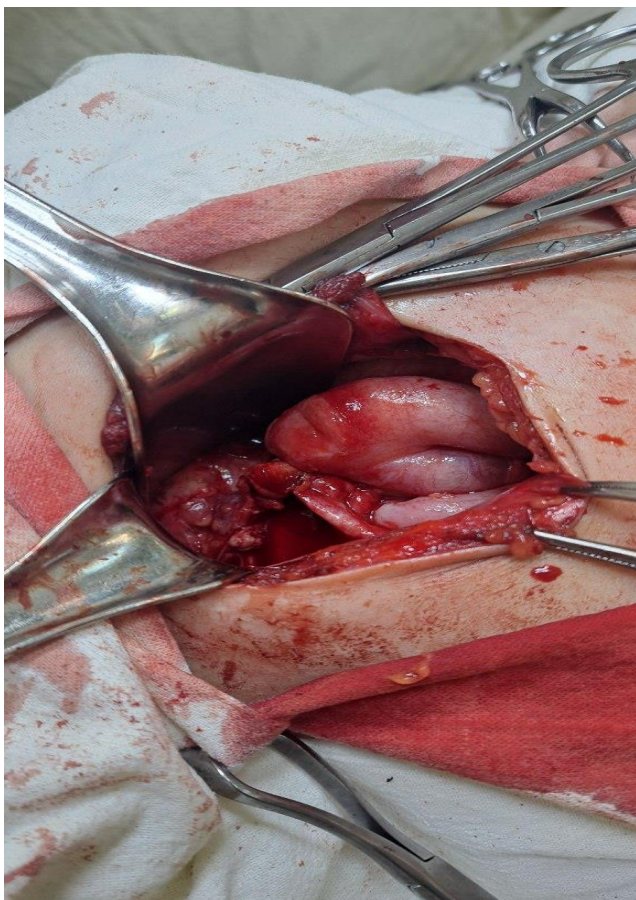


**Figure 2.** Patient I.A., diagnosis: AAIO. Intraoperative view during adhesiolysis

Patients who showed improvement in pain (positive dynamics of the pain syndrome) but in whom ultrasound still indicated adhesions – as well as those in whom ultrasound signs were unclear – were prescribed a second course of anti-adhesion therapy one month after the first. Additional repeat treatment courses were administered as dictated by the persistence or recurrence of clinical symptoms. In 29 children for whom the initial course of conservative anti-adhesion therapy had no clinical effect, laparoscopic adhesiolysis became the only effective treatment option.



**Figure 3.** Patient K.B., 14 years old, diagnosis: AAIO. Necrotic intestinal tissue following adhesive intestinal obstruction



**Figure 4.** Patient I.A., diagnosis: AAIO. Operative process (laparotomy after conversion)

The feasibility of videolaparoscopic adhesiolysis depended on the extent and density of the adhesions in the abdominal cavity. During laparoscopic surgery, surgeons encountered difficulty in inserting the first trocar into the abdominal cavity due to adhesions. Dense adhesions in the abdomen restricted the general view of the operative field and altered the normal anatomic relationships of the organs. The following intraoperative findings (according to O. I. Blinnikov's classification) were factors that necessitated conversion to open laparotomy or the use of a video-assisted approach:

- Diffuse adhesions in the abdominal cavity (Grade IV);
- Necrosis of intestinal loops due to acute obstruction;
- Intestinal loops tightly adherent to the parietal peritoneum;
- Technical complications during laparoscopy (e.g. massive hemorrhage, opening of an intestinal loop, or inability to complete adhesiolysis in the presence of dense fibrous adhesions).

Employing endovideolaparoscopic technology, the separation of thin, film-like visceroparietal adhesions did not present technical difficulty. However, in the process of eliminating dense visceroparietal and viscerovisceral adhesions, instances of profuse bleeding from the bowel wall were observed. To facilitate the performance of complete videoendoscopic adhesiolysis, a fibrinolytic mixture (FLM) prepared at our center was injected into the abdominal cavity preoperatively. The composition of this fibrinolytic mixture was: heparin 10,000 IU + fibrinolysin 20,000 IU + hydrocortisone 125 mg + gentamicin 80 mg + novocaine 0.25% – 200 mL. Administration of the FLM exerts a pathogenetic effect on intra-abdominal adhesion processes by causing lysis of fibrinous collagen bands, which are the main component of adhesions. As a result, dense adhesions transform their fibrous consistency into a gel-like state, making them easier to separate during surgery and thereby reducing trauma and improving the technical conditions of the operation. The adhesiolysis procedure is completed by aspirating blood and clots from the abdominal cavity. To improve intestinal motility, 0.5% novocaine was injected into the mesentery of the small intestine using a long puncture needle.

In an attempt to decrease inflammation and adhesion formation, intraperitoneal administration of the fibrinolytic solution in cases with pronounced inflammatory changes led to rapid derangement of vital organ and system functions, pronounced hyperfibrinogenemia, and impaired fibrinolysis. These observations once again indicate that minimally invasive surgical methods are necessary for the early prophylaxis of abdominal adhesive disease. The fibrinolytic mixture (FLM) dissolves fibrin strands, normalizes fibrinolysis, and most importantly, prevents the formation of adhesions. Videolaparoscopic adhesiolysis combined with intraperitoneal FLM application reduces fibrinogen concentration and restores fibrinolysis to normal levels; this is one of the reliable methods for early postoperative prophylaxis of adhesive disease in children.

After laparoscopic adhesiolysis, patients received an anti-recurrence therapy course for 7 days. For patients who underwent adhesiolysis, 2–3 courses of anti-adhesion therapy (each course lasting 10 days) were prescribed at 3-month intervals, followed by ultrasound monitoring. Subsequently, these children were monitored on an outpatient basis with mandatory follow-up examinations and ultrasound: every 3 months during the first year, and then once every 6 months for the next 3–5 years. The number of conservative therapy courses was determined on an individual basis, depending on the extent of the surgical intervention, the degree of clinical efficacy, and the dynamics of ultrasound findings.

In cases where a pronounced adhesive process was found during laparoscopy and the risk of injury to internal organs was high, conversion to an open laparotomy (with video assistance) was indicated. At the same time, the ability to visually inspect the abdominal cavity allowed us to avoid unnecessarily extensive laparotomies that would increase operative trauma.

A study of the long-term outcomes of 1–2 courses of conservative anti-adhesion treatment in the 195 patients with adhesive disease revealed that 152 (57.6%) patients were re-hospitalized due to persistence or recurrence of abdominal pain. Among these, 54 (42.4%) patients were readmitted with clinical signs of acute adhesive intestinal obstruction and were operated on emergently. In 24 patients with a diffuse adhesive process in the abdominal cavity, it was possible to stabilize their general condition, relieve pain, and normalize nutrition; however, the ongoing risk of developing intestinal obstruction necessitated placing these patients under continuous dispensary (long-term) observation.

#### 4. Conclusions

Indications for elective surgical treatment of patients with acute adhesive intestinal obstruction include an unsatisfactory clinical effect of conservative therapy and the presence of ultrasound signs of intestinal loops adherent to the parietal or visceral peritoneum. In patients who achieved a clearly positive clinical effect from conservative management—namely, when the ultrasound signs of conglomerated adhesions to the peritoneum were eliminated—multiple courses of conservative therapy were carried out until the pain syndrome had completely resolved. The above information confirms that minimally invasive surgical methods are necessary for the early prevention of abdominal adhesive disease. The use of our fibrinolytic mixture (FLM) during surgery dissolves fibrin bands, normalizes fibrinolysis, and most importantly, prevents the formation of adhesions. Performing videolaparoscopic adhesiolysis with intraoperative FLM treatment of the abdominal cavity lowers fibrinogen levels and normalizes fibrinolysis; this approach has proven effective in the postoperative management and early prevention of adhesive disease in children.

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