

ORIGINAL ARTICLE

PROGRAMMED LAPAROSCOPY IN THE OF DIFFUSE APPENDICULAR PERITONITIS TREATMENT OF CHILDREN

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ABSTRACT

The aim: To analyze the implementation of programmed laparoscopy with the criteria definition for its termination in the treatment of diffuse appendicular peritonitis in children.

Materials and methods: Since 2017, the programmed laparoscopy in the treatment of diffuse appendicular peritonitis has been used in 28 children aged 1 to 16 years.

Results: The programmed laparoscopy allows assessing the dynamics of the intra-abdominal infectious-inflammatory process and monitoring the treatment effectiveness. The modified abdominal index (AI) was determined based on integrated assessment of degree and nature of abdominal organs' damage during the first and repeated surgeries, the modified abdominal index (AI) was determined. AI identified during the primary laparoscopic intervention ranged from 14 up to 22 points and on average it was 17.5 ± 1.3 points, during the programmed laparoscopy AI was from 3 to 11 points, on average it was 9.15 ± 1.48 points.

Conclusions: The programmed laparoscopy for diffuse peritonitis in children allows controlling the pathological process in the abdominal cavity and promptly eliminate intra-abdominal complications. Determination of AI allows objectifying the nature of the lesion and the dynamics of changes in the abdominal cavity.

KEY WORDS: diffuse peritonitis, programmed laparoscopy, children

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INTRODUCTION

Complete rehabilitation of the abdominal cavity is the key to successful treatment of all peritonitis forms. After all, in the future it is insufficient or inadequate primary rehabilitation of the abdominal cavity leads to the progression of peritonitis, the formation of demarcated abscesses, which requires relaparotomies and significantly worsens the prognosis [1].

But radical sanation is not always possible during primary surgery in cases of abrupt inflammatory changes of the visceral peritoneum with massive purulent-fibrinous layers and the connective process. To solve this problem, it is proposed to conduct planned (programmed) sanation of the abdominal cavity, with their implementation in 48-72 hours [2].

Currently, a lot of authors consider the laparoscopic sanation as an alternative to the method of programmed revisions and sanations of the abdominal cavity. The advantages of laparoscopic interventions over traditional ones are more accurate determination of peritonitis prevalence at the diagnostic stage, less traumatic intervention, significant reduction of wounds, especially infectious complications, early activation and rehabilitation of patients, good cosmetic effect [3].

THE AIM

The aim to analyze the experience of performing the programmed laparoscopy with defining criteria for its termination in the treatment of diffuse appendicular peritonitis in children.

MATERIALS AND METHODS

Before 2017, in cases of impossibility of full sanation of the abdominal cavity with diffuse peritonitis in children, programmed relaparotomies were performed. 1 to 6 programmed relaparotomies were performed in children with common forms of peritonitis. The effectiveness of the first sanative relaparotomies to reduce the effectiveness of each subsequent one is noted [2].

Since 2017, programmed laparoscopy in the treatment of diffuse appendicular peritonitis has been used in 28 children aged 1 to 16, boys 19, girls 9. Laparoscopic surgery was performed using laparoscopic equipment "Richard Wolf", designed especially for children. The need for conversion arose in 1 patient. Adequate laparoscopic sanation of the abdominal cavity was considered impossible due to the presence of dense massive layers of fibrin and intestinal paresis.

The study was carried out in accordance with the principles of the Declaration of Helsinki. The research protocol was approved by the Local Ethics Committee (LEC) of all the institutions mentioned in the work. The informed consent of the children's parents (or their guardians) was obtained.

RESULTS

Based on an integrated assessment of the degree and nature of damage to the abdominal organs during the first and repeated operations, a modified abdominal index (AI) was determined by VS Savelyev et al. (1998).



Fig. 1. Patient with perforated appendicitis and diffuse peritonitis operated on laparoscopy



Fig. 2. The planned laparoscopic sanitation after 48 hours after the first surgery

Table I. Criteria for intraoperative assessment of the nature of the lesion of the abdominal cavity

Criteria	Points
Prevalence of peritoneal inflammation:	
- local (abscess)	1
- spread	3
The nature of the exudate:	
-serous	1
-purulent	3
-hemorrhagic	4
-fecal	4
Fibrin layers:	
- in the form of loose masses	1
- in the form of a shell	4
State of intestinal - intestinal dilatation	3
- lack of peristalsis	3
- failure of the intestinal wall	4
Total quantity of points – TQP	

Criteria for intraoperative assessment of the nature of the lesion of the abdominal cavity (in points) are shown in Table I. The results were processed using Student's t-test. Differences were considered statistically significant at $p \leq 0,05$.

In all children during primary surgery the significant inflammatory changes of the visceral peritoneum, massive purulent-fibrinous layers, pronounced connective tissue from the formation of multiple abscesses corresponded to the 5th class of the laparoscopic system of acute appendicitis according to Gomes et al [4] (Fig. 1). AI was determined during the primary laparoscopic intervention, ranged from 14 to 22 points and averaged 17.5 ± 1.3 points.

In all children with common forms of peritonitis one programmed laparoscopic sanitation of the abdominal cavity was performed. During the programmed laparoscopy, the AI ranged from 3 to 11 points that on average is of 9.15 ± 1.48 points (Fig. 2).

In only one case, during the first programmed laparosanation the AI was 15 points and it was decided to perform the next planned laparosanation. All children underwent the prolonged epidural anesthesia in the postoperative period.

DISCUSSION

Endovideosurgical method allows a thorough revision of the abdominal cavity to assess the nature and amount of exudate, its location, the presence and nature of fibrin layers, the process of commissural formation, the condition of parietal and visceral peritoneum, the formation of intra-abdominal abscesses, intestinal hemorrhage, The color, the state of the intestinal wall, the presence of peristalsis was examined [5].

At the same time, it is noted that the opportunities of endovideosurgery are limited by a number of circumstances that are difficult to predict in advance. They can often be seen during surgery. As a rule, these circumstances are due to technical difficulties in performing a particular stage of the operation. Sometimes it is impossible even a full revision of the abdominal organs, especially the elimination of peritonitis and sanitation of the abdominal cavity. This may be due to the process of commissural formation, terminal peritonitis with the formation of strong fibrous commissures and multiple inter-loop abscesses, severe intestinal paresis, technical difficulties of surgical removal of the organic substrate of the disease [6].

P.S. Rusak [7] as the criteria to imply the programmed laparosanations considers signs of further development of peritonitis according to the results of monitoring the postoperative period. In our observations, the decision to perform re-laparosanation was made during the initial surgery in the absence of radical sanitation of the abdominal cavity and was not subject to revision.

Programmed laparoscopy allows not only to assess the dynamics of intra-abdominal infectious-inflammatory process and monitor the treatment of effectiveness, but also to sanate the abdominal cavity, including separation of commissures in the abdominal cavity to prevent early intestinal obstruction, abdominal abscess accumulation with local washing of the affected areas, if necessary, control and correction of the location of drainages. [5,8].

The number of repeated sanative laparoscopic interventions is on average 2-3, although if necessary it can be increased to 7-8 [5]. In our observations, only one repeated sanative laparoscopy was performed, only in one case there was a need for 2 repeated laparoscopic interventions.

CONCLUSIONS

The programmed laparoscopy for diffuse peritonitis in children allows controlling the pathological process in the abdominal cavity and promptly eliminate intra-abdominal complications. Determination of AI allows objectifying the nature of the lesion and the dynamics of changes in the abdominal cavity. The indication for termination of programmed laparoscopy is AI in the range of 3-11 points.

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Conflict of interest:

The Authors declare no conflict of interest.

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