ABORDĂRI TACTICE ALE TRATAMENTULUI CHIRURGICAL LA PACIENȚII CU FORME COMPLICATE DE APENDICITĂ ACUTĂ CU RISC RIDICAT DE INSUFICIENȚĂ CARDIOPULMONARĂ

TACTICAL APPROACHES TO THE SURGICAL TREATMENT OF PATIENTS WITH COMPLICATED FORMS OF ACUTE APPENDICITIS WITH A HIGH RISK OF CARDIOPULMONARY INSUFFICIENCY

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Rezumat
Apendicita acută este cea mai frecventă urgență chirurgicală abdominală, iar apendicectomia este încă cea mai utilizată intervenție chirurgicală. Efectuată de peste un veac printr-o miniincizie în fosa iliacă dreaptă, în majoritatea cazurilor, apendicectomia ar putea fi încadrată în grupa operațiilor miniminvazive. În ultimele două decenii, schimbările majore survenite în diagnosticul și tratamentul afecțiunilor chirurgicale s-au repercutat și asupra patologiei apendiculare. Un prim progres s-a realizat în diagnosticul apendicitei acute prin utilizarea pe scară largă a imagisticii, în mod special a ecografiei, ceea ce a dus la un diagnostic mai precis și reducerea apendicectomiilor nenecesare. A doua mare modificare terapeutică a fost efectuarea și răspândirea apendicectomiei laparoscopice, cu toate atuurile bine cunoscute ale intervențiilor miniminvazive. Asociația Europeană de Chirurgie Endoscopică (EAES: European Association of Endoscopic Surgery) recomandă laparoscopia diagnostică la pacienții cu suspiciune de apendicita acută. În SUA și în țările dezvoltate, majoritatea apendicitelor acute sunt abordate laparoscopic, deși apendicectomia laparoscopică nu poate fi considerată deocamdată ca și "gold standard". Prezentăm mai jos experiența în apendicectomie laparoscopică pe care o utilizăm în clinică.
Cuvinte cheie: apendicită acută, apendicită complicată, apendicectomie, insuficiență cardiopulmonară, laparoscopie.

Summary
Acute appendicitis is the most common abdominal surgery, and appendicectomy is still the most commonly used surgical procedure. Performed for over a century by a mini-incision in the right iliac fossa, in most cases, the appendectomy could be included in the group of minimally invasive operations. In the last two decades, major changes in the diagnosis and treatment of surgical disorders have also had an impact on the appendix pathology. A first progress was made in the diagnosis of acute appendicitis through the widespread use of imaging, especially ultrasound, which led to a more accurate diagnosis and reduction of unnecessary appendectomies. The second major therapeutic change was performing and spreading laparoscopic appendectomy, with all the well-known advantages of minimally invasive interventions. The European Association of Endoscopic Surgery (EAES) recommends diagnostic laparoscopy in patients with suspected acute appendicitis. In the US and developed countries, most acute appendicitis is treated laparoscopically, although laparoscopic appendectomy cannot be considered as a "golden standard" yet. We present below the experience in laparoscopic appendectomy that we use in the clinic.
Keywords: acute appendicitis, complicated appendicitis, appendectomy, cardiopulmonary insufficiency, laparoscopy.

Introduction

The vast experience of surgeons around the world has firmly established that in acute appendicitis, early surgery is the only rational method of treatment. It is proved that the earlier the appendix is removed, the better are results of surgical treatment.

Laparoscopic appendectomy (LA) was a possible alternative to open appendectomy (AA), since Kurt Semm reported of the first LA in 1983 [1]. Many studies have been conducted since then, showing the advantages of LA including less postoperative pain, less postoperative morbidity and excellent cosmetic results [2, 3]. The extensive experience of laparoscopic appendectomy in complicated AA in emergency surgery confirms the significant advantages of the endovideosurgical method over the standard method of appendectomy [4, 5, 6]. According to the fact that pneumoperitoneum, which is necessary for laparoscopic imaging, has known effects on cardiopulmonary physiology, patients with cardiopulmonary disorders are in high risk when treated with minimally invasive procedures. Despite these theoretical risks, there is a lack of data studying the effect of laparoscopic approach on patients with cardiopulmonary pathology and CHF [7].

Objective: Assess the possibilities and effectiveness of the endovideo-surgical method for treating patients with complicated forms of acute appendicitis and high risk of cardiopulmonary insufficiency and to determine indications for using various methods of laparoscopic appendectomy.

Materials and methods

In the surgical clinic of the Department of Surgery No. 2 of the ONMedU (2015-2018) for the last 3 years, 67 patients with complicated acute destructive appendicitis and concomitant cardiopulmonary pathology have been treated. Among them were 42 males (52.6%) and 25 females (37.4%). The age of patients ranged from 50 to 80 years. All patients revealed different degrees of severity of concomitant pathology of the

cardiopulmonary system (Table 1).

Table 1

Patients with severe concomitant pathology

Nosology	Number of patients
Postinfarction cardiosclerosis with cardiovascular insufficiency 1	19
Hypertensive with 2-3-st, CHF 1-2-st	36
Bronchial asthma with severe respiratory failure	9
Bronchiectasis	3
67 total	67

All patients underwent a series of general clinical and laboratory examinations (ultrasound, CT, CBC ,UT, blood glucose). The diagnosis of acute appendicitis was made on the basis of clinical signs before surgery in 63 patients, in 5 patients the diagnosis was determined intraoperatively. Before the operation, all patients underwent an abdominal ultrasound scan to confirm the diagnosis and pre-operative detection of fluid accumulation in the abdominal cavity.

All patients with AA were divided into 2 groups. The first group consisted of 29 (43.3%) patients with complicated AA, with a high risk of cardiopulmonary failure, who underwent open appendectomy. Open appendectomy was performed using the standard technique from a Volkovich-Dyakonov (Mc-Burney) incision in 19 (65.5%) patients and midline laparotomy in 10 (34.5%) patients. The second group consisted of 38 (56.7%) patients with complicated OA who underwent laparoscopic appendectomy and drainage of the abdominal cavity. Classical laparoscopic surgery with the imposition of pneumoperitoneum was performed in 20 (29.8%) patients and using the laparolifting method in 18 (26.9%) patients.

Patients of both groups were examined urgently and, after preoperative preparation, were operated on. In the preoperative period, antibiotic prophylaxis of broad-spectrum antibacterial drugs in daily dosage was performed in all.

The type and extent of surgery in group 1 are presented in table 2. The main types of surgery were appendectomy from the appendicular incision with drainage of the abdominal cavity with one or two drains due to the presence of peritonitis or abscess. Median laparotomy was performed according to strict indications, due to the presence of severe concomitant cardiopulmonary pathology. In 8 patients the volume of surgical intervention was supplemented by closed intestinal intubation due to the presence of paralytic dynamic intestinal obstruction. Intraoperatively, an effluent was collected for bacteriological examination.

Table 2

Open surgery in patients of group 1

Operation	Number of patients
Incision Volkovich-Dyakonov (Mc-Burney), appendectomy, drainage of the abdominal cavity	12
Incision of Volkovich-Dyakonov (Mc-Burney), appendectomy, sanitation and drainage of the abdominal cavity	6
Midline laparotomy, AE, sanation and drainage of the abdominal cavity	8
Median laparotomy, AE, closed intubation of the small intestine, sanitation and drainage of the abdominal cavity	3

One patient died with symptoms of decompensation of severe heart failure. Postoperative mortality was 1.4%.

The nature and type of laparoscopic operations performed in the second group are presented in Table 3. The main type of operation was laparoscopic appendectomy (LA), sanation and drainage of the abdominal cavity. In 5 patients, intraoperatively, a loose appendicular infiltrate was detected, which could be separated by a blunt and acute route followed by the implementation of the main stage of the operation. In 2 patients, after performing LA sanation and drainage, it was necessary to apply a laparoscopic laparostomy, the purpose of which was to perform programmed laparoscopy to re-sanitize the purulent focus and revise the abdominal cavity in order to identify and liquid drainage.

Table 3

Laparoscopic surgery in patients of group 2

Operation	Number of patients with the imposition of pneumoperitoneum	Number of patients with the imposition of laparolifting technique
LA, drainage of the abdominal cavity	9	11
LA, sanitation and drainage of the abdominal cavity	9	7
LA, sanitation and drainage of the abdominal cavity, the imposition of laparoscopic laparostomy	2	-

There were no deaths in this group.

LA using laparolifting was performed using a Zaporozhenko-Kolodiy device for laparolifting developed in the clinic (Ukrainian patent for invention No. 101921 of 05/13/2013 - a device for performing laparoliftig laparoscopic interventions). Contraindications for performing laparoscopy with pneumoperitoneum among patients of the 2nd group were standard (severe cardiopulmonary pathology), which required the use of a laparo-lifting technique. The average duration of the disease before the start of surgery among these patients is 1.6 ± 0.1 days.

In all patients, the abdominal cavity was drained. The average duration of surgical intervention did not differ from that and amounted to 47.8 ± 7.2 minutes

The number of postoperative complications in patients of groups 1 and 2 is presented in table 4.

During the first days of postoperative period patients continued empirical antibacterial therapy with broad-spectrum antibiotics, with a subsequent transition (if necessary, after obtaining the results of bacteriological cultures) to selective antibiotic therapy and correction of pathological syndromes of the cardiopulmonary and hepato-renal systems. The hospital stay in the postoperative period after LAE with complicated forms of acute appendicitis was 6.9 ± 2.35 bed-days. In the group with open AE – were 15.6 ± 5.1 bed-days. Patients after minimally invasive interventions were in the hospital for an average of 8 days less than patients who underwent an appendectomy with open laparotomy.

Table 4

Postoperative complications in patients of groups 1 and 2

Complications	2 group	1 group
Bleeding	1 (1.4%)	0
Pneumonia	0	2 (3%)
Atrial fibrillation	2 (3.4%)	2 (3.4%)
Retention of urine	2 (3%)	4 (5.9%)
Infection of p/o wounds	0	3 (4.5%)
Total	5 (7.8%)	11 (16.8%)

Conclusion

1. Laparoscopic appendectomy can be performed in almost all patients with acute appendicitis with its complications and in patients with high risk of cardiopulmonary insufficiency, provided that the revision, rehabilitation and drainage of the lesions of fluid accumulations are adequately performed.

2. Laparoscopic appendectomy allowed to drastically reduce the number of abdominal complications (suppuration of the postoperative wound, abscesses of the abdominal cavity, early adhesive intestinal obstruction, formation of the occurrence of postoperative ventral hernias), as well as reduce the frequency of decompensation of concomitant cardiopulmonary diseases.

3. Performing laparoscopic appendectomy is the optimal method for AA in patients with a high risk of cardiopulmonary diseases.

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