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# Laparoscopic TAPP Single Access Hernioplasty with Simultaneous Appendectomy for Chronic Appendicitis

**K. Yu. Parkhomenko**

**Kharkiv National Medical University, Kharkiv, Ukraine**

ORSID: https://orcid.org/0000-0002-0004-2417

## Abstract

**Aim**. To investigate the technological features and immediate results of simultaneous laparoscopic hernioplasty of inguinal hernia and appendectomy in chronic appendicitis.

**Methods**. Was performed the analysis of the initial data, complications, duration of surgery and hospitalization in patients after simultaneous appendectomy and TAPP inguinal hernia repair in comparison with isolated TAPP.

**Results**. Simultaneous appendectomy during laparoscopic hernioplasty does not significantly affect the performance of TAPP inguinal hernia repair, but it increases the duration of the intervention due to additional manipulations. This does not affect the incidence of complications and the length of hospital stay.

**Conclusions**. Simultaneous laparoscopic appendectomy for TAPP hernioplasty is advisable in patients with chronic appendicitis and inguinal hernias.

**Key words: chronic appendicitis; inguinal hernia; TAPP; simultaneous appendectomy; immediate results.**

Simultaneous surgeries, by which we mean surgical interventions under single anesthesia on two or more organs, are increasingly being performed for various diseases

requiring surgical treatment. In abdominal surgery, it is quite common to report anterior abdominal wall hernias with pathology of gall bladder, liver, diaphragm, gastrointestinal tract, urinary system organs, retroperitoneal space, and internal genital organs [2, 5, 9].

With the wide introduction of videolaparoscopic technologies the variety and frequency of simultaneous surgeries has increased significantly as the peculiarities of laparoscopic access allow to perform good visualization of abdominal cavity and to perform surgery on various organs without additional accesses [3, 6]. In recent years, laparoscopic access is used in hernioplasty, in particular, by the technology of transabdominal preperitoneal plasty (trans-abdominal preperitoneal plastic – TAPP) with alloplastic materials, which allows to perform revision of the abdominal cavity to detect concomitant diseases and to perform simultaneous surgery in multiple abdominal pathologies [1, 8].

One of such operations is simultaneous laparoscopic hernioplasty of inguinal hernia and laparoscopic appendectomy, the technique of which is well developed in acute and chronic appendicitis [4].

**The aim** of the study was to study technological peculiarities and immediate results of simultaneous laparoscopic hernioplasty of inguinal hernia and appendectomy in chronic appendicitis.

**Material and methods of the study**

The research was carried out on the basis of the surgical department of the Kharkov Regional Clinical Hospital. The analysis of the immediate results of surgical treatment of ventral hernias in 11 patients in whom laparoscopic simultaneous alloplasty with laparoscopic appendectomy was performed was carried out, including bilateral alloplasty in two cases.

The diagnosis of chronic appendicitis was based on clinical and anamnestic findings and instrumental examination data. Four patients had recently (6 to 12 months) acute appendicitis complicated by an iliac or pelvic appendicular infiltrate.

In 7 cases chronic appendicitis was diagnosed on the basis of clinical signs (recurrent pain syndrome in the iliac region) combined with CT signs of chronic appendicitis (deformities, increased diameter of the appendix, etc.) With clinical signs of appendicitis suffered 14 to 28 months ago, but without documented evidence. In all cases, the patients sought medical care for a right-sided inguinal hernia, and the patients attributed the pain syndrome specifically to the hernia. Comprehensive examination did not reveal any other pathology (genital, gastroenterological, or musculoskeletal) that could be the cause of the pain syndrome.

The comparison group included 10 patients who underwent laparoscopic inguinal hernia alloplasty. All patients underwent general clinical blood and urine tests, biochemical blood tests, blood coagulation studies, and instrumental studies: abdominal ultrasonography, abdominal X-rays, chest X-rays, spiral CT scan of the abdomen in 7 cases; women were consulted by a gynecologist.

Transabdominal preperitoneal plasty according to the standard technique was used in all patients: with the use of three tracars (paraumbilical, right and left mesogastric). A 3DMAX-Light Mesh or ProGrip Laparoscopic Self-Fixing Mesh graft was used for alloplasty with the size of 7.9 x 13.4 cm, which was fixed to the periosteum of the pubic bone, inguinal ligament and muscle layer of the anterior abdominal wall using a herniostepler. At the second stage of the operation, appendectomy was performed using an additional 5-mm trocar (along the midline, 5 cm above the pubis). Mobilization of the appendix was performed using bipolar electrocoagulation followed by ligation of the mesentery.

The appendix base was ligated or clipped using EndoGia - 30 mm or Hem-o-Lok clippings. The appendix was removed in a container through a 10-mm trocar and a 5-mm silicone tubular drainage was inserted into the iliac fossa. All patients received prophylactic antibacterial therapy with fluoroquinolones.

The exit data, the frequency of complications, the duration of surgery and hospitalization were studied. The obtained data were processed using descriptive statistics methods; the results were compared using Student's test and $\chi 2$ criterion using Excel program of Microsoft Office 2010 standard package.

**Results of the study and their discussion**

The output clinical and anamnestic data between the main group and the comparison group did not differ significantly (Table 1).

During the revision of the abdominal cavity in the main group the diagnosis of chronic appendicitis was confirmed by visual signs (presence of deformity, signs of fibrosis, uneven thickness, rigidity of the appendix tissue, etc.). The implementation of hernioplasty in patients of both groups did not differ significantly.

The implementation of hernioplasty in the patients of both groups did not differ significantly. In patients in the main group, due to an additional manipulation - appendectomy, the duration of the operation increased by about 18 minutes compared with the comparison group ($p < 0.001$ according to Student's test). In three cases of appendectomy we additionally performed adhesiolysis due to the presence of adhesions in the iliac fossa; in

one case we observed moderate bleeding during adhesiolysis, which was stopped by electrocoagulation. There was no need for conversion or other features.

Table 1

Outcome clinical and anamnestic findings of the examined patients

| index | Main group (n=11) | Comparison group (n=10) | p |
|---|---|---|---|
| average age (M±SD) | 39,8±6,4 | 35,9±7,5 | >0,05[1] |
| Gender:<br>women<br>men | <br>4 (36%)<br>7 (64%) | <br>1 (10%)<br>9 (90%) | >0,05[2] |
| Hernia type by L.M. Nyhus:<br>I type<br>II type<br>III type | <br>2 (18%)<br>5 (46%)<br>4 (36%) | <br>2 (20%)<br>5 (50%)<br>3 (30%) | >0,05[2] |

Note. 1 - significance of the difference according to Student's test;
2 - significance of the difference according to $\chi 2$ test.

No significant effect of simultaneous appendectomy on the development of complications and duration of hospitalization was found for inguinal hernioplasty (p> 0,05 according to Student's test).

According to the results of the analysis of the publications devoted to simultaneous surgeries, laparoscopic appendectomy is most often performed for gynecological pathology and for acute appendicitis. Surgical interventions for chronic appendicitis are performed much less frequently, primarily due to diagnostic difficulties [10; 11]. In this series of cases, the indications for surgery were a transferred appendicular infiltrate [7] and/or chronic recurrent pain syndrome in the right iliac region and CT scan findings.

In all cases the diagnosis was confirmed during laparoscopic revision. Morphological signs of chronic appendicitis were an additional justification for appendectomy.

**Conclusions**

In patients with signs of chronic appendicitis (previous appendicular infiltrate or recurrent pain syndrome in the right iliac region) and inguinal hernia a simultaneous operative intervention - laparoscopic appendectomy and hernioplasty by TAPP-method is advisable.

Laparoscopic inspection of the abdominal cavity allows us to visually assess the condition of the appendix and to objectify indications for appendectomy, which is an additional argument in favor of simultaneous appendectomy and hernioplasty using laparoscopic access.

**References**

1. Achkasov EE, Mel'nikov PV. Sovremennyie tendentsyi v hirurgii pahovyh gryzh: mirovaia praktika [Modern trends in inguinal hernia surgery: world practice]. Hirurgiia, 2015; 10:88-93 (in Russian)

2. Gerbali OYU. Simul'tannyie operatsyi u bol'nyh s hronicheskim kalkulioznym holetsystitom [Simultaneous operations in patients with chronic calculous cholecystitis]. Endoskopicheskaia hirurgiia, 2014; 6:26-28 (in Russian)

3. Gordeev SA, Lutsevich OE, Prohorov YaA. Kombinirovannyie vmeshatel'stva v laparoskopicheskoy hirurgii [Combined interventions in laparoscopic surgery]. Endoskopicheskaia hirurgiia, 1998; 1:14-18 (in Russian)

4. Dronov AF, Kotlobovskiy VI, Poddubniy IV. Laparoskopicheskaia appendektomiia (obzor literatury i sobstvennyiy opyt) [Laparoscopic appendectomy (literature review and personal experience)]. Endoskopicheskaia hirurgiia, 2000; 3:16-20 (in Russian)

5. Zaporozhan VN, Tatarchuk TF, Dronov AI, Dronova VL, Kruchina EA. Simul'tannyie operatsyi pri sochetanii ginekologicheskoy i hirurgicheskoy patologii [Simultaneous operations with a combination of gynecological and surgical pathology]. Endokrinologiia, 2013; 7:7-16 (in Russian)

6. Ivanov VV, Puchkov KV. Odnomomentnyie laparoscopicheskiie operativnyie vmeshatel'stva pri sochetannyh zabolevaniiah organov briushnoy polosti i malogo taza u patsyentov s ozhyreniiem [Simultaneous laparoscopic surgical interventions for combined diseases of the abdominal cavity and small pelvis in obese patients]. Vestnik Natsyonal'nogo mediko-hirurgicheskogo Tsentra imeni NI Pirogova, 2011; 6(4):65-68 (in Russian)

7. Pronin VA, Boyko VV. Patologiia cherveobraznogo otrostka i appendektomiia [Pathology of the appendix and appendectomy], Har'kov: CIM; 2007; 271 (in Russian)

8. Sazhin AV, Klimiashvili AD, Kochiay E. Laparoskopicheskaya transabdominal'naia preperitoneal'naia i total'naia ekstraperitoneal'naya pahovaia gernioplastika, preimushchestva i nedostatki [Laparoscopic transabdominal preperitoneal and total extraperitoneal inguinal hernioplasty, advantages and disadvantages]. Rus. med. zhurnal, 2015; 21(6):46-49 (in Russian)

9. Semionov VV, Kurygin AlA. Simul'tannyie operatsyi na organah zhyvota: spornyie i ochevidnyie aspekty problemy [Simultaneous operations on the abdominal organs: controversial and obvious aspects of the problem]. Vestnik hirurgii, 2014; 173(6): 96-99 (in Russian)

10. Kothadia J.P., Katz S., Ginzburg L. Chronic appendicitis: uncommon cause of

chronic abdominal pain. Therap. Adv. Gastroenterol. – 2015. – Vol. 8, N. 3. – P. 160–162

11. Shah S.S., Gaffney R.R., Dykes T.M., Goldstein J.P. Chronic appendicitis: an often forgotten cause of recurrent abdominal pain. Am. J. Med. – 2013. – Vol. 126, N. 1. – P. e7–e8

12. Plymale MA, Ragulojan R, Davenport DL, Roth JS. Ventral and incisional hernia: the cost of comorbidities and complications. Surg Endosc. 2017 Jan;31(1):341-351. doi: 10.1007/s00464-016-4977-8

13. Hayakawa S, Hayakawa T, Inukai K, Miyai H, Yamamoto M, Kitagami H et al. Simultaneous transabdominal preperitoneal hernia repair and laparoscopic cholecystectomy: A report of 17 cases. Asian J Endosc Surg. 2018 Nov 8. doi: 10.1111/ases.12667

14. TonoliniM.Multidetector CT of expected findings and complications after contemporary inguinal hernia repair surgery**.** Diagn IntervRadiol. 2016 Sep; 22(5): 422–429. doi: 10.5152/dir.2016.15578