

LAPAROSCOPIC PLASTIC OF INGUINAL HERNIAS

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Abstract

The problem of surgical treatment of inguinal hernias over the last 25 years has gone through global changing. Tension free correction of defects of the anterior abdominal wall with using of synthetic prostheses are now the undisputed favorites in the treatment of inguinal hernias. After Lichtenstein operation, Laparoscopic hernia repair now occupies the second place in the structure of operations for inguinal hernias.

During the period from 2011 performed 149 laparoscopic hernia repair TAPP, of which 19 patients with recurrent hernias, after autoplasty (10) and alloplasty by Liechtenstein (9) and 11 with bilateral hernias. The authors did not mention severe intra-or postoperative complications, as well as the conversion to open surgery at failure during laparoscopic surgery. From intraoperative complications they met more often bleeding (4). The greatest technical difficulties arose in damage of inferior epigastric vessels. In the postoperative period they met next complication: most frequent groin hematoma (4), neuralgia (2) and paresthesias (5), pain in humeroscapular

area (4). The laparoscopic techniques of hernia repair are effective, pathogenetically substantiated, provides a comfortable postoperative period and the possibility of early rehabilitation.

Key words: inguinal hernia, laparoscopic procedure, mesh, herniostepler, complication

The relevance of ventral hernias treatment is caused by wide circulation of this pathology (3-7% of the population) with primary damage of working-age, rather high percent of a recurrence, after surgeries. It is known that 75% of all ventral hernias are inguinal hernias which during life arise at 25% of able-bodied men and 3% of women. Plasticity of these hernias is one of the high frequency surgical interventions in the world. At the same time the number of the emergency operations for inguinal hernias remains high, and the lethality remains at the level of 6% and does not tend to reduction [1].

Traditional technicians are followed by considerable trauma of soft tissue that leads to the expressed pain during postoperative period and disability for a period up to 1,5-2 months. New prospects in surgery of hernias are opened by the low-invasive laparoscopic technique which allows to avoid many shortcomings of traditional surgery. Also well recommend M.E. Arregui in 1991 [13] method of a trans-abdominal pre-peritoneal hernioplasty (TAPP). The available data, according to the opinion of most of surgeons, demonstrate that methods of pre-peritoneal prosthetics in treatment of hernias is a forward with other methods of a hernioplasty [2] therefore the endovideo surgical method of treatment of inguinal hernias (TAPP), is considered pathogenetic reasonable, provides good access and visualization of anatomical structures of the inguinal channel, make a hernioplasty with the smallest injury and the greatest efficiency [1, 6]. It should be noted, that accumulated experience and different variety of the publications devoted to the considered problem there is no united tactical doctrine at the choice of a method of treatment of inguinal hernias [3]. Opinions of various authors are very contradictory [5, 7].

Materials and methods: 339 patients had laparoscopic hernioplasty TAPP, 14 patients were performed TEP, from them at 49 patients with recurrent hernias after auto-(28) and alloplasty by Liechtenstein (9) and 21 with bilateral hernias was executed since 2011. All patients were from 25 to 50 years and came to surgical office routinely after standard medical

examination in the polyclinic. 11 patients had TAPP simultaneously with a laparoscopic cholecystectomy.

Pre-surgical diagnostics were based, as a rule, on a data of clinical investigation of the patient and identification of the hernial protrusion. Considering universality of a laparoscopic treatment of inguinal hernias (TAPP), there is no need for exact verification of a hernia type at a pre-surgical stage, especially since it allows to diagnose "mute" hernias (not shown clinically), which are formed on the counter-lateral side.

We use light polypropylene or composite meshes (Ultrapro, Parietex, etc.) weighing 25-45 g/m² with larger cell. These meshes are usually deformed only by 4-10%, keeping elasticity in tissues and don't cause pain. Heavy (80-100 g/m²) meshes with a small cell are liable to scarring and severe deformation in tissues, losing up to 60% of the initial area, that can cause a recurrence of hernia [1, 6]. 5 mm surgical instruments may be used for reduction of surgical injury and increase the cosmetic effect. When using tools of bigger diameter (10-12 mm) wounds by trocar should be closed

Discussion: The recurrence of the disease is the main criterion of operation efficiency. According data of authors, the number of a recurrence after laparoscopic hernioplasty can be from 0,6% to 3%. (16, 18, 24).

One of the leading complications after laparoscopic hernioplasty of inguinal hernias is development of a syndrome of chronic postoperative pain. International Association of the Study of Pain determines chronic postoperative pain as pain persisting at least three month after surgery. One of the main reasons for formation of chronic pain after a laparoscopic hernioplasty is nerves injury and hardening of the artificial mesh.

It promoted further improvement of artificial meshes and development of essentially new designs - the self-fixed meshes of "Parietex Progripp" and the lightweight polyester meshes. This way, the lightweight mesh of 3D MAX LIGHT Mesh is commonly used in the practice. It has configuration and bends which exactly correspond to anatomy of inguinal area, providing a reliable hernioraphy of any hernial inguinal defect. The firm adherence to tissues allows to reduce the quantity of points of fixation to the mesh from 7-9 till 2-3.

We believe, that the indication to TAPP are bilateral direct inguinal hernias at male adult patients (> 30 years), and also recurrent hernias after traditional open plasticity and Liechtenstein operation. Open Liechtenstein plasticity and an endoscopic way of plasticity of inguinal hernia

are shown as the best confirmed options of surgical treatment for the first emerged unilateral hernia. If we perform correction of two sides hernias we use mobilization of peritoneum and by two meshes, and drainages pre-peritoneum space in any cases. Sholdays plasticity should be used if non-mesh plasticity is needed. Considering only chronic pain, endoscopic plasticity is more preferable than open installation of a mesh.

TAPP contraindications are: impossibility of using of an intense carboxyperitoneum while massive adhesive process in an abdominal cavity as a result of the numerous abdominal operations complicated by formation of intestinal fistulas, big and huge ventral hernias, long stay with lifted lower extremities in patients with serious associated diseases of cardiovascular and pulmonary systems. The purulent process on a abdominovesical pouch in a zone of alleged operational access can also become a contraindication to TAPP. We consider a Liechtenstein non-tension hernioplasty to be an operation of choice in such patients.

Results: We didn't notice any heavy intra-or postoperative complications, as well as a conversion into an open intervention in the case of failure of laparoscopic access, or any purulent or ischemic complications. Total number of less significant complications is noted at 21 patients.

Bleedings were noticed most often among the intraoperative complications. The greatest technical difficulties appeared in the cases of damage of the lower epigastric vessels. There was mentioned 1 bleeding from a trocar wound and 3 cases of bleeding while performing a section of a parietal peritoneum. Average blood loss was 147,3 ml. The hemostasis in all cases is reached using laparoscopic way - a suture or coagulation. Damage of the lower epigastric vessels happened (in all cases) to patients with obesity of the I-III degree that is connected with the evident pre-peritoneal lipidosis. Now, right after opening of a peritoneum we make its traction, that causes development of local pre-peritoneal emphysema. This method allows to exfoliate a peritoneum from the lower tissues, including epigastric vessels. Besides, we consider a careful hemostasis to be obligatory even in cases of insignificant bleeding. It is necessary because after performing removal of gas, the small damaged vessels can bleed some time again in the end of operation, being the reason of development of a postoperative hematoma.

Among the complications connected with use of a carboxyperitoneum, we noted development of hypodermic emphysema in 2 patients.

In the postoperative period hematomas of inguinal area (4), neuralgia (2) and a paresthesia (5), a brachiocephalic pain syndrome were most often admitted (4).

Drainage of an artificial limb space after TAPP was not made. At all these patients preperitoneal hematomas which were diagnosed at ultrasonography are noted and liquidated conservatively by punctures. The quantity of punctures varied from 1 to 5. Repeated intervention (re-laparoscopy) was required to one patient after bilateral TAPP when at ultrasonography the recurrence was suspected. The operation was finished with drainage of pre-peritoneal space for 12-24 hours.

The humero-scapular pain syndrome usually came on second day and was intermittent. This complication was not mentioned in the works of other authors, but, in our opinion, has to be considered in the postoperative period.

Sensitivity disturbance and paresthesia most often developed on the anterior and lateral surface of a hip. Neuralgia was noticed in groin and a scrotum areas. These symptoms were temporary and did not limit activity of the patients. The pain syndrome (neuralgia) and paresthesia in most cases are consequence of the damage or compression of branches of the nerves passing in the operation zone. According to literature the frequency of such symptoms can be in 3 - 5,12% of cases (3, 7, 11, 21). Anatomically outside from spermatic vessel and directly under the fibers of an ilea-pubic path there are sexual and femoral branches of a femoral and sexual nerve, a femoral nerve and a lateral cutaneous nerve of thigh. Imposing of fixator (taker) behind and below the ilea-pubic path can damage noted nerves, that can be followed by neuralgia and paresthesia of the corresponding zones in the postoperative period. Thus, in our research pain in inguinal area and the scrotums (5 patients) could be a consequence of branch damage of a femoral and sexual nerve which innervate this zone. The long-lasting paresthesia of the internal surface of a thigh, which was noted in one patient, was connected, most likely, with injury of a femoral nerve. Considering anatomy, we began to fix a mesh transplant more lateral to the vessels of a spermatic cord, imposing fixators (takers) higher than ilea-pubic path and parallel to it. That practically excludes damage of nerves, ilea vessels and their branches. We did not note paresthesia while using the self-fixed meshes of "Parietex Progripp".

The recurrence in terms up to 3 years was not noted by us.

Conclusions: Laparoscopic operation is an effective method of treatment. It provides comfortable postoperative period and a possibility of early rehabilitation (in cases of hernias of small and middle sizes). Along with well-known advantages, we consider important to note the specific advantages of a laparoscopic hernioplasty, comparing to traditional methods, - a

possibility of investigation of an abdominal cavity, one-stage plasticity of bilateral inguinal hernias and simultaneous closing with a transplant of all weak points of a anterior abdominal wall.

Literature

1. Andreev A.L. Sravnitel'nyj analiz rezul'tatov operativnogo lecheniya bol'nyh s pahovoj gryzhej./ A.L. Andreev, R.M. Luk'yanchuk // Neotlozhnaya i specializirovannaya hirurgicheskaya pomoshch'.- Pervyj kongress moskovskih hirurgov. Tez. dokl. Moskva, 19-21 maya 2005. – M.: GEOS, 2005. – 245 s. [in Russian]
2. Belov I.N. Ranevye oslozhneniya posle gryzhesechenij s primeneniem allotransplantata i bez nego/A.L.Andreev, R.M. Luk'yanchuk //Neotlozhnaya i specializirovannaya hirurgicheskaya pomoshch'.- Pervyj kongress moskovskih hirurgov. Tez. dokl. Moskva, 19-21 maya 2005. – M.: GEOS, 2005. – s.246-247. [in Russian]
3. Grubnik V.V. Sovremennye metody lecheniya bryushnyh gryzh. / V.V. Grubnik, A.A. Losev, N.R. Bayazitov i dr. // Kiev: Zdorov'e.- 2001.-280 s. [in Russian]
4. Mitin S.E. Operaciya Lihtenshtejna ili laparoskopicheskaya gernioplastika – chto proshche, bezopasnee i nadezhnee, chto luchshe? /S.E. Mitin, S.I. Peshekhonov, D.B. CHistyakov //Aktual'nye voprosy gerniologii. - Mater. konf., Moskva, 9-10 oktyabrya, 2002.- s. 38-40. [in Russian]
5. Egiev V.N. Nenatyazhnaya gernioplastika./ Egiev V.N. - M.: Medpraktika, 2002.- s.324. [in Russian]
6. Prishvin A.P. Rezul'taty laparoskopicheskoy gernioplastiki /A.P. Prishvin, S.B. Singaevskij// Aktual'nye voprosy gerniologii.- Mater. konf., Moskva, 9-10 oktyabrya, 2002.- S. 45-46. [in Russian]
7. Prishvin A.P. Optimizaciya metodiki laparoskopicheskoy gernioplastiki / A.P. Prishvin, N.A. Majstrenko, S.B. Singaevskij //Vestnik Hirurgii.- 2003.-tom.162.-№ 6.-s. 71-75. [in Russian]
8. Puchkov K.V. Alloplastika pahovyh gryzh s ispol'zovaniem polipropilenovogo implantanta. / K.V. Puchkov, V.B. Filimonov, V.V. Osipov i dr. // Gerniologiya. -2004.-№1.- s.36-40. [in Russian]
9. Rutenburg G.M. EHndovideohirurgiya v lechenii pahovyh i bedrennyh gryzh /G.M. Rutenburg //V kn.: Izbrannye lekicii po ehndovideohirurgii /Pod redakciej akademika V.D. Fedorova. – SPb.: OOO «Firma «KOSTA», 2004.- 216 s. [in Russian]

10. Sedov V.M.. Oslozhneniya v laparoskopicheskoy hirurgii i ih profilaktika./ V.M. Sedov, V.V. Strizheleckij // sPb.: Sankt-Peterburgskoe medicinskoe izd-vo, 2002. – S. 121-143. [in Russian]
11. Timoshin A.D. Taktika lecheniya pahovyh gryzh v obshchekhirurgicheskom stacionare./ A.D. Timoshin, A.V. YUrasov, A.L. SHestakov i dr. // Aktual'nye voprosy gernerologii.- Mater. konf., Moskva, 9-10 oktyabrya, 2002.- s.66-67. [in Russian]
12. SHEvchenko YU.L. Oshibki, opasnosti i oslozhneniya operativnogo lecheniya pahovyh gryzh/ YU.L. SHEvchenko, K.V. Lyadov, YU.M. Stojko i dr. // Neotlozhnaya i specializirovannaya hirurgicheskaya pomoshch'.- Pervyj kongress moskovskih hirurgov. Tez. dokl. Moskva, 19-21 maya 2005. – M.: GEOS, 2005. – s.273. [in Russian]
13. Arregui M. Laparoscopic repair of inguinal hernias with mesh using a preperitoneal approach. / M. Arregui, R. Nagan //Presentation, Advanced Laparoscopy, St. Vincents Hospital, Indianapolis, May 20, 1991.
14. Corbit J.D. Transabdominal preperitoneal herniorraphy /J.D. Corbit // Surg. Laparosc. Endosc. – 1994.- Vol. 4 – p. 411
15. Kald A. Outcome of repair of bilateral groin hernias: a prospective evaluation of 1,487 patients./ A. Kald, S. Fridsten, P. Nordin et all // Eur J Surg.- 2002.-vol. 168.-№3.- p.150-153
16. Liem M.S. The learning curve for totally extraperitoneal laparoscopic inguinal hernia repair./ M.S. Liem, C.J. van Steensel, R.U. Boelhouwer //Am. J. Surg.- 1996.-vol. 171.- p. 281-285
17. Ridings P. The transabdominal pre-peritoneal (TAPP) inguinal hernia repair: a trip along the learning curve./ P. Ridings, D. S. Evans //J.R. Coll. Surg. Edinb.- 2000.-vol.45.- p. 29-32
18. Seid A.S. Entrapment neuropathy in laparo-scopic herniorraphy. / A.S. Seid, E. Fmos //Surg. Endosc. –1994.- vol.8.-p.1050-1053
19. Sarli L. Prospective randomized comparative study of laparoscopic hernioplasty and Lichtenstein tension-free hernioplasty./ L. Sarli, N. Pietra, O. Choua et all. //Acta Biomed Ateneo Parmense.- 1997.- vol.68. № 1.-2.- P.5-10
20. Schulz C. Laparoscopic inguinal hernia repair. A review of 2500 cases / C. Schulz, I. Baca, V. Gotzen // Surg. Endosc. – 2001.- v.15.- № 6.- p. 582-584

21. Szymanski J. Laparoscopic repair of inguinal hernias with higher risk for recurrence: independent assessment of results from 121 repairs./ J. Szymanski, A. Voitk // Am. Surg. – 2001.- vol. 67.- № 2.- p. 155-158 Surg. Endosc. – 2001.- v.15.- № 6.- p. 582-584
22. Thumbe V.K. To repair or not to repair incidental defects found on laparoscopic repair of groin hernia: early results of a randomized control trial / V.K. Thumbe, D.S. Evans // Surg Endosc.- 2001.- vol. 15.- № 1. – p.47-49
23. Wilson M.S. Prospective trial comparing Lichtenstein with laparoscopic tension-free mesh repair of inguinal hernia/ M.S. Wilson, G.T. Deans, W.A. Brough //Brit. J. Surg.- 1995.-vol. 82.- p. 274-277