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ESTIMATION OF OPTIONS OF THE MESH IMPLANT FIXATION IN TRANSABDOMINAL PREPERITONEAL ALLOPLASTY IN PATIENTS WITH INGUINAL HERNIA

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Ключові слова: *пахвинна грижа, сітчастий імплантат, TAPP, рецидив, клейова фіксація, післяопераційний біль*

Ключевые слова: *паховая грыжа, сетчатый имплантат, TAPP, рецидив, клеевая фиксация, послеоперационная боль*

Abstract. *Estimation of options of the mesh implant fixation in transabdominal preperitoneal alloplasty in patients with inguinal hernia. Feleshtinsky Ya.P., Kohanevich A.V. The frequency of chronic postoperative pain after TAPP surgery maintains at the level of 4,6-18.7%, and the incidence of inguinal hernia recurrence is from 5.3% to 10%. Purpose – to estimate efficiency of different variants of fixation of a mesh implant in TAPP in patients with inguinal hernia. Various variants of fixation of a mesh implant in TAPP in patients with inguinal hernia have been analyzed. Immediate results: pronounced postoperative pain was observed in 6 (7.5%) patients of group I, in 1 (1.25%) patients of group II, in group III postoperative pain was absent. Long-term results: chronic post-operative inguinal pain was observed in 5 (7.57%) patients of group I, in 2 (3.12%) of group II, in group III chronic postoperative persistent pain was not observed. The recurrence of inguinal hernia was in 5 (7.57%) patients of group I, in 1 (1.56%) patient of group II and in 1 (1.53%) patient of group III. The results of the TAPP operation for the inguinal hernia with different types of fixation of the mesh showed that glue fixation has significant advantages among them.*

Реферат. *Оценка вариантов фиксации сетчатого имплантата при трансабдоминальной преперитонеальной аллопластике у больных паховой грыжей. Фелештинський Я.П., Коханевич А.В. Частота хронічної післяопераційної болю після операції TAPP держиться на рівні 4,6-18,7%, а частота рецидивів пахових грыж – от 5,3% до 10%. Цель – оцінка ефективності різних варіантів фіксації сітчатого імплантата при TAPP у больових пахової грыжі. Проведен аналіз різних варіантів фіксації сітчатого імплантата при TAPP у 240 больових пахової грыжі. Непосередні результати: виражена післяопераційна біль спостерігалась у 6 (7,5%) больових I групи, у 1 (1,25%) больового II групи, у III групи виражена післяопераційна біль не відзначалась. Віддалені результати: хронічна післяопераційна пахова біль була у 5 (7,57%) больових I групи, у 2 (3,12%) II групи, в III групі хронічна післяопераційна пахова біль не спостерігалась. Рецидив пахової грыжі був у 5 (7,57%) больових I групи, у 1 (1,56%) больового II групи і у 1 (1,53%) больового III групи. Результати виконання TAPP при пахових грыжах з різними варіантами фіксації сітки показали, що клеева фіксація серед них має суттєві переваги.*

The introduction of laparoscopic transabdominal preperitoneal alloplasty (TAPP) in inguinal hernia during the last decade has improved the results of their surgical treatment. Compared with the open operation by Liechtenstein, the use of TAPP significantly reduces the length of patients' stay in the hospital, postoperative complications in the

wound, rehabilitation and return to physical activity [1]. At the same time, the remote results of the surgical treatment of the inguinal hernia after TAPP and Liechtenstein operation are similar, in particular the frequency of chronic postoperative pain maintains the level at of 4.6-18.7%, and the frequency of recurrences of inguinal hernias – from

5.3% to 10% [2, 3]. The main causes of recurrence of the inguinal hernia after TAPP are considered to be insufficient overlapping with the mesh implant of the medial and lateral inguinal holes and the absence of mesh fixing at the lower edge at the level of the ileal vessels, which can lead to wrinkling of the mesh and its twisting. Regarding the causes of chronic postoperative pain, this is mainly due to the stapling (mechanical) fixation of the mesh implant along its lateral edge at the segment of the branches n. femoral [4, 2, 6]. The use of special frame polypropylene mesh that does not require fixation (3Dmax, polysoft, onflex) as well as self-fixing mesh (Progrid) in TAPP has not been widely implemented in clinical practice. Such meshes even in the early postoperative period are frequently displaced and migratory, which does not ensure the reliability of the closure of the inguinal area defect [1, 5, 9, 10]. This indicates that the fixing of the mesh at TAPP is necessary. To our opinion, the search for an optimal variant of fixing a mesh implant (stapler, stapler-glue and glue) in TAPP will allow to optimize the operation and improve the results of surgical treatment of inguinal hernias.

The purpose is to evaluate the effectiveness of various variants of fixing a mesh implant in TAPP in patients with inguinal hernia.

MATERIALS AND METHODS OF RESEARCH

In the clinic of the Department of Surgery and Proctology NMAPE named after PL Shupyk various variants of fixation of a mesh implant in TAPP in 240 patients with inguinal hernia for the period from 2010 to 2018 were analyzed. The age of patients is from 25 to 75 years, the average age is 50.8 ± 2.7 years. All patients were male. Right-sided inguinal hernia was observed in 161 (67.08%) patients, left-sided - in 58 (24.16%) patients, bilateral inguinal hernia was diagnosed in 21 (8.76%) patients, the oblique hernia was observed in 172 (71.66%) of patients, including inguinal-scrotal - in 27 (11,25%), direct - in 68 (28,33%) patients.

Depending on the TAPP technique and according to the fixation options for the mesh implant, the patients were divided into three groups. In the group I (80 patients), the classical TAPP technique was performed with a mechanical (staple) fixation of the mesh. In the group II (80 patients) the operation was performed according to the TARR method with the combined (stapling and glue) fixation of the mesh implant (patent for utility model No. 113997 from 02/27/2017) [3] developed by the authors. In the group III (80 patients), our advanced TAPP technique with adhesive fixation of the mesh was performed. As a mesh implant, a light polypropylene mesh was used. The groups of patients were

compared by age, localization and size of the inguinal hernia. The classic TAPP technique with the mechanical fixation of the mesh implant included arcuate incision of the parietal peritoneum over the hernia defect, the isolation of the hernia sac with the mobilization of the preperitoneal space at the level of Cooper's ligament and ileal vessels, the placement of a mesh polypropylene implant of 8x12cm in size at the level of these anatomical structures [7, 8] Fixation of the mesh was performed along its upper medial and lateral edges using hernia stapler (ProTack). Peritonization of the mesh was also performed by hernia stapler.

The TAPP method with the combined variant of fixation of the mesh implant performed in patients of the group II was different from the classic one, as mobilization of the parietal peritoneum was performed 3-4 cm below Cooper's ligament and 3-4 cm below the lateral and medial inguinal fossa. Polypropylene mesh implant of 12x15 cm in size was placed 3-4 cm below Cooper's ligament and inguinal fossa. The fixation of the mesh was combined, namely: the mechanical fixation with the hernia stapler was performed only along the upper medial edge up to the transverse and direct muscles, aponeurosis and Cooper's ligament, and along the lateral edge and the lower one at the level of the ileal vessels and the ilea-pubic tract, the mesh implant was fixed with glue on the basis of ethyl- α -cyanoacrylate. Peritonization of the mesh was carried out with the glue.

The TAPP method with adhesive fixation of the mesh implant performed in patients of the III group was different from the method performed in patients of the group II, as fixation of the mesh was performed by the glue along the perimeter of the direct and transversal muscles, Cooper's ligament, the ilea-pubic tract, and fixation at the level of ileal vessels. Defect of the parietal peritoneum was also closed with the glue.

The results of TAPP with different types of fixation of the mesh implant were evaluated by comparing the immediate and remote postoperative complications.

RESULTS AND DISCUSSION

Immediate results showed that in 6 (7.5%) patients of group I on the site of the placed mesh implant postoperative pain was noted, which, in our opinion, was due to mechanical fixation of the mesh with the hernia stapler along the lateral edge of the mesh and on the site of the ilea-pubic tract and most likely, by traumatism of branches n. femoralis. Among patients of the group II, the expressed postoperative pain was observed only in 1 (1.25%) patient. Reducing the frequency of severe

postoperative pain in patients of this group was achieved due to the fact that the fixation of the mesh implant along the lower and lateral edges was performed with the glue. In patients of the group III, the expressed postoperative pain was not marked, as the staple fixation of the mesh was not performed. In patients of the group I, seroma of the preperitoneal space of the inguinal area was diagnosed during the ultrasound examination in 5 (6.25%) patients, in the group II – in 4 (5%) patients, in the group III – in 4 (5%). Hematoma of the scrotum in the group I was observed in 2 (2,5%) patients, in the group II – in 3 (3,75%), in group III – in 1 (1,25%). These postoperative complications in patients of all groups were comparable. Seroma of the preperitoneal space in patients with an average volume of fluid of 20.0 ± 4.5 ml was eliminated by administration of non-steroidal antiinflammatory drugs (diclofenac, nimesil) for 7.0 ± 1.1 days. For the treatment of scrotal hematoma, liotone gel, dolobene-gel was used, this contributed to its elimination during $10,0 \pm 2,3$ days. The terms of patients' stay in the hospital after the operation among patients of all groups were 1.8 ± 0.5 days.

The evaluation of long-term results was performed using the MOS SF-36 questionnaire, repeated checkups, ultrasound examination of the anterior abdominal wall and abdominal cavity. Long-term results of treatment were studied in terms of 6 to 60 months. A total of 66 patients in group I, which underwent classical TAPP with mechanical (stapling) fixation of the mesh, 64 patients in group II after modified TAPP with a combined (stapler and glue) fixation of the mesh and 65 patients of group III after the improved TAPP with glue fixation of the mesh were examined. Of 66 patients examined in group I, chronic postoperative inguinal pain was observed in 5 (7.57%) during 8 ± 2.1 months, of 64 patients examined in group II – in 2 (3.12%) during 8 ± 2.1 months, in 65 patients of group III, chronic post-operative inguinal pain was not observed. It should be noted the reduction of the frequency of chronic post-operative pain in patients of the group II as compared with the group I due to the reduction of the volume of staple fixation of the mesh implant.

The absence of chronic post-operative pain in patients of group III indicates that fixation of the mesh with glue excludes the injury of the nerves of the inguinal site. In 5 (7.57%) patients of the group I, out of 66 examined, a recurrence of inguinal hernia was revealed, they did not indicate a physical overload in the first month after surgery. Among them in 3 (4,54%) patients it developed in 1-2 months, and in 2 (3,03%) patients – in 6 months after surgery, this was confirmed by ultrasound examination. In 64 examined patients of group II, recurrence of inguinal hernia was detected in 1 (1,56%) patient within 1 month, due to early physical activity. Among 65 patients of the group III, 1 (1.53%) case of recurrence of inguinal hernia was observed as well, this was also associated with early physical activity.

The emergence of recurrences of inguinal hernias in patients after classical TAPP, taking into account the lack of physical activity in the early post-operative period, in our opinion, is due to the fact that the mesh along the lower edge was not fixed.

Thus, analyzing the results of TAPP with different variants of fixation of the mesh, it can be argued that glue fixation was the most optimal, it does not lead to the trauma of the nerves of the inguinal site and excludes the occurrence of pain in the early postoperative period and chronic postoperative pain. In addition, the fixation with the glue of the mesh implant along its perimeter provides for a reliable closure of the defect of the inguinal area and significantly reduces the likelihood of recurrence of inguinal hernia.

CONCLUSIONS

The results of TAPP performing with different types of mesh fixing (stapler, stapler-glue and glue) in inguinal hernias showed that adhesive fixation has significant advantages and reduces the frequency of postoperative pain from 7.5% in staple fixation to 1.25% in staple – adhesive one and its absence in adhesive fixation, of chronic postoperative pain from 7.57% to 3.12% respectively, and absence in adhesive fixation, relapses of inguinal hernias from 7.57% to 1.53%.

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