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TAPP IN THE TREATMENT OF IRREDUCIBLE AND INGUINOSCROTAL HERNIA

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Abstract

Laparoscopic surgery is known to be technically difficult to perform for irreducible and inguinoscrotal hernias. The aim of the work is to conduct a comparative analysis of early postoperative complications in the surgical treatment of irreducible and inguinoscrotal hernias using the modified laparoscopic and classic TAPP techniques. Comparative analysis of the local early postoperative complications in 49 male patients who were surgically treated for irreducible and/or inguinoscrotal hernias was carried out. The patients were divided into 2 groups according to the technique of hernioplasty: the first group (n = 19) - surgical treatment was performed by the classical hernioplasty, described in the literature, TAPP technique; the second group (n = 20) - surgical treatment included a modified laparoscopic TAPP technique. Only 1 (5.3%) patient in group 1 (p = 0.079) who had experienced bleeding during surgery. Post-operative subcutaneous emphysema was common in 5.3% in group 1 and 5.0% in group 2 (p = 0.490), inguinal hematoma in 5.3% and 5.0% (p = 0.490), scrotal hematoma in 10.5% and 0% (p = 0.445), inguinal paresthesia 5.3% and 5.0% (p = 0.490), inguinal seroma 5.3%

and 5.0% ($p = 0.490$), scrotal seroma 26.3% and 0% ($p = 0.047$), orchiepididymitis 5.3% and 0% ($p = 0.079$) respectively.

The modified technique of transabdominal preperitoneal repair of irreducible and inguinoscrotal hernia provides low-trauma fractures of surgery, which reduced the incidence of local intra- and postoperative complications.

Keywords: irreducible hernia; inguinoscrotal hernia; transabdominal preperitoneal repair TAPP; postoperative complications.

Introduction. Inguinal hernia is one of the most common diseases all over the world that suffers from about 5% to 10% of the population [1]. Currently, in many manuals, Liechtenstein method is mentioned as a standard reference surgical method of treating inguinal hernias, the advantages of which are the short duration of the operation and does not need high surgical qualifications and prolonged training [1].

There are many methods of plasticity of inguinal hernias. In addition to classical open plastic, more and more preference is given to the laparoscopic plastic of the inguinal hernia [2].

The laparoscopic plastic of the inguinal hernia, including laparoscopic transabdominal preperitoneal repair (TAPP) and laparoscopic total extraperitoneal repair (TEP), has become one of the gold standards of inguinal hernia repair. These methods were implemented all over the world had proven patient benefits such as the advantages of minimal invasiveness and high efficiency [3]. A comparative analysis of the TAPP and TEP methods showed their advantages over the Lichtenstein technique [4]. However, the development of TAPP and TEP methods requires a longer time and complications in these operations are of a special nature [2, 3, 5].

A special group of patients with inguinal hernias are patients with inguinoscrotal hernias. This is due to the anatomical features of the inguinoscrotal hernia (the long length of the hernial sac, the large diameter of the internal inguinal ring, adhesions of the hernial sac with surrounding tissues) and the technical aspects of the operation itself- the technically complex approach to the release of the inguinoscrotal hernia and the implementation of hernioplasty. There may be damage of the structures of the elements of the seed cord, blood vessels and nerves of the inguinal region with the occurrence of bleeding during and after surgery; hematomas, seroma, ischemic orchitis, inguinal neuralgia, etc. In the postoperative period, an extensive wound surface formed after the hernia and leading To the insufficiency of the posterior wall of the inguinal canal, the complexity of hernioplasty). The

technical difficulties of the operation also arise when the irreducible inguinal hernia isolated. Of interest is the development of new technical techniques for TAPP plastic for inguinoscrotal and irreducible inguinal hernias, which will reduce the technical complexity of the operation and thereby reduce the frequency of the occurrence of local intra- and postoperative complications.

The aim of the work is to conduct a comparative analysis of early postoperative complications in the surgical treatment of irreducible and inguinoscrotal hernias using the modified laparoscopic and classic TAPP techniques.

Materials and methods

A comparative analysis of local early postoperative complications was carried out in 49 male patients who conducted surgical treatment for irreducible and/or inguinoscrotal hernias.

Depending on the methodology of the ongoing hernioplasty, patients were divided into 2 groups: the first group (n = 19) - surgical treatment was carried out by classical, described in the literature, TAPP methodology. The second group (n = 20) - surgical treatment included a laparoscopic modified TAPP methodology.

The modified TAPP technique, with a large size of the hernial sac, consisted of high resection of the hernial sac: cut the peritoneum at the level of horizontal diameter of hernial gates from the medial fossa. The contents of the hernial sac in the abdominal cavity were traced. If the content of the hernial sac was fixed, it was separated. The hernial sac was circularly resected at the level of the neck, formed platform for the mesh. After installing the mesh, it was puritanized by a section of the cutty flap of the peritoneum of a hernial sac. The diameter of the hernial gate in size > 2 cm, sutured. They sewed a Poupart's ligament and the lower edge of the inner oblique and transverse muscles. In the case of an irregular inguinal hernia, the hernia contents were traced into the abdominal cavity. When the contents of the hernial sac fixed to the peritoneum, the operation was performed as well as with a fixed hernia. If the contents of the hernial sac could not be adjusted to the abdominal cavity, conversion and hernioplasty according to the Lichtenstein method were performed. With a fixed hernia, the cut-off fabrics were cut off only in the case of the fixed omentum; if the intestines turned out to be fixed, the intestine was carried out due to the cutting of the peritoneum with fabrics fixed to it. They liberated the lateral, medial inguinal and femoral fossils with subsequent laparoscopic hernioplasty.

By age composition and clinical parameters, patients in groups were comparable (Table 1).

Table 1

The main characteristics of patients in both groups

Age and basic clinical indicators	Group 1 (n=19)	Group 2 (n=20)	OR (CI)	χ^2	p
Age (year), average (SD)	62,1 (11,4)	62,6 (12,3)			
Irreducible hernias	10 (52,6 %)	11 (55,0 %)	0.91 (0.26-3.20)	0.03	0.862
Left -sided hernia	4 (21,1 %)	4 (20,0 %)	1.07 (0.23-5.05)	0.10	0.752
Right -sided hernia	15 (78,9 %)	16 (80,0 %)	0.92 (0.25-3.42)	0.05	0.830
Nyhus-II	3 (15,8 %)	4 (20,0 %)	0.75 (0.14-3.90)	0.01	0.940
Nyhus-IIIb	16 (84,2 %)	16 (80,0 %)	1.17 (0.31-4.43)	0.01	0.909

Notes: p – is the probability of differences regarding the indicators of two groups;
SD – standard deviation.

According to the classification of L.Nyhus, in group 1, the slanting of inguinal hernia (Nyhus-II), which was not controlled, observed in 15.8 % of cases, in group 2-20.0 %; inguinoscrotal (Nyhus-IIIB) in the group 1-84.2 %, group 2-80.0 %. Among the inguinoscrotal hernias, the irreducible hernia in group 1 is noted in 43.8 %, in group 2-43.8 % of patients. Gigantic hernias of large sizes of the II or III type according to the classification of Trakarnsagna et al. [6] The study was not included.

A comprehensive examination was carried out before the operation, which was carried out considering age and related diseases. With an ultrasound examination (ultrasound) before the operation, the size of the hernial sac and its contents were determined. In the postoperative period, ultrasound was also used to determine the sizes of seroma and hematomas. The general anesthesia with the intubation of the trachea and the use of muscle relaxants was common in all patients.

The criteria for evaluating the results were the nature and frequency of local early postoperative complications.

The following criteria were chosen to evaluate the results of surgical treatment: bleeding during surgery (BDS); postoperative inguinal hematoma (PIH); scrotal hematoma (SH); inguinal paresthesia (IP); subcutaneous emphysema (SE); inguinal seroma (IS); scrotal seroma (SM); orchiepididymitis (OE).

Statistical analysis was performed using Statistic 10 software. Statistical analysis

included arithmetic mean (M), probability of differences in the study results (p) relative to the values of the different groups (results were considered probable when the significance ratio was less than or equal to 0.05), determination of the median series, quartiles, binary classification, Pearson consistency test (χ^2) and OR (odds ratio). The confidence interval (CI) was set at 95% and defined as ± 1.96 standard error.

Results

The nature and frequency of local complications during surgery and in the early postoperative period are shown in Table 2.

Table 2

Nature and frequency of local complications during surgery and the early postoperative period

Indicators	Group 1 (n=19)	Group 2 (n=20)	OR (CI)	χ^2	p
IH	1 (5,3 %)	1 (5,0 %)	1.06 (0.06-18.17)	0.47	0.490
SH	2 (10,5 %)	0		0.58	0.445
IP	1 (5,3 %)	1 (5,0 %)	1.06 (0.06-18.17)	0.47	0.490
SE	1 (5,3 %)	1 (5,0 %)	1.06 (0.06-18.17)	0.47	0.490
IS	1 (5,3 %)	1 (5,0 %)	1.06 (0.06-18.17)	0.47	0.490
SS	5 (26,3 %)	0		3.91	0.047
BDS	1 (5,3 %)	0		0	0.979
OE	1 (5,3 %)	0		0	0.979

Notes: χ^2 – Pearson's goodness of fit test; p – probability of differences, relative to group performance; IH – inguinal haematoma; SH – scrotal haematoma; IP – inguinal paresthesia; SE – subcutaneous emphysema; IS – inguinal seroma; SS – scrotal seroma; BDS – bleeding during surgery; OE – orchiepidididymitis.

There were no anesthesia-related complications and no cardiovascular or respiratory complications.

Only 1 patient (5.3%) in Group 1 had bleeding during the operation (p = 0.079). Technical difficulties were encountered when the lower epigastric vessels were injured. Hemostasis was achieved laparoscopically. Postoperatively, subcutaneous emphysema was observed in each group, with 5.3% in group 1 and 5.0% in group 2 (p = 0.490), IH was observed in group 1 in 5.3%, group 2 in 5, 0 % (p = 0.490), observations, SH - 10.5 % and 0

% ($p = 0.445$), IP - 5.3 % and 5.0 % ($p = 0.490$), IS - 5.3 % and 5.0 % ($p = 0.490$), SS - 26.3 % and 0 % ($p = 0.047$), OE - 5.3 % and 0 % ($p = 0.079$) respectively.

Conversions were in group 1 - 2 (12.5 %) of patients. Conversions were caused by cicatricial changes in the hernia sac and surrounding tissues.

Groin and scrotal hematomas, groin seromas, orchioepididymitis phenomena regressed after conservative and physiotherapeutic treatment. Scrotal seromas were eliminated by puncture meatotomy under ultrasound monitoring (1 to 3 punctures).

No iatrogenic injuries were observed in either group during surgery.

Discussion

In the case of an irreducible inguinal hernia, adequate muscle relaxation must be performed to allow for some dilation of the hernia gate. This allowed us in all cases to reposition the contents of the hernia sac into the abdominal cavity and to dissect it out.

With a fixed hernia, dissection of the fixed tissues was possible only in the case of a fixed omentum. If the intestine was fixed, it was often technically impossible to detach. The best solution is therefore to dissect the peritoneum with the intestine from the adjacent tissues, followed by successive release of the lateral, medial inguinal and femoral fossa.

Reduced number of conversions, hemorrhage during the operation, reduced incidence of hematoma and scrotal seroma, and orchioepididymitis after the operation, was promoted by the low traumatism of the modified technique of high resection of the hernia sac in patients with inguinoscrotal hernia. Particular attention was paid to the careful preparation of the peritoneum along the lower semicircle of the hernia sac since inguinoscrotal hernia always occurs dislocation of the spermatic cord.

Conclusions

The modified technique of transabdominal preperitoneal repair of irreducible and inguinoscrotal hernias provides low traumaticity of surgery and significantly reduced the incidence of scrotal seroma after surgery with $p = 0.047$.

High resection of the hernia sac in patients with inguinoscrotal hernia avoids the traumatic stage of surgery in hernia dissection, thereby reducing the incidence of conversion.

The method of separating the peritoneum with the intestine fixed to it in cases where the intestine is tightly fixed over a long distance to peritoneum of the hernial sac, avoids iatrogenic damage of intestines.

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