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Abstract.

The article presents the results of treatment of 28 children with various diseases of the upper urinary tract (hydronephrosis, solitary cyst of the kidney, urolithiasis, calculus of the middle third of the ureter, non-functioning kidney against the background of reflux nephropathy), operated on by endovideosurgical retroperitoneal access. The follow-up period after surgery ranged from 1 to 3 years. A comparative analysis of the results of treatment with a group of patients operated on by laparoscopic and open approaches was carried out.

Keywords: endosurgery; pediatric urology; retroperitoneoscopy; laparoscopy; children; diseases of the upper urinary tract.

In modern surgery, open surgical interventions have already ceased to meet the level of development of medicine due to their high trauma and are increasingly giving way to endovideosurgical technologies. Given their minimally invasive nature, this direction is especially attractive in pediatric urology.

Endovideosurgical operations for diseases of the upper urinary tract are mainly performed by laparoscopic access (LD), there are isolated reports on the use of retroperitoneoscopic access (RD) in children [1–4].

The presence of a natural cavity and a wide working space for the location of trocars makes laparoscopic interventions convenient and widely used in urology. However, transperitoneal access is associated with the risk of mechanical and thermal damage to the abdominal organs, the possibility of developing urinary peritonitis due to the ingress of blood and urine into the abdominal cavity, as well as difficulties in performing the operation in patients with adhesive disease. In this regard, of great interest is the retroperitoneoscopic method, which allows to avoid complications associated with opening the abdominal cavity. The researchers also emphasize that for a urologist, retroperitoneoscopic access during surgical interventions on the organs of the retroperitoneal space is more familiar, all instruments are inserted along the shortest path through the lumbar region directly into the retroperitoneal space without opening the abdominal cavity, which indicates its high physiology [5, 6].

Nevertheless, the general principles of retroperitoneoscopic operations are still insufficiently covered in the domestic literature, there are no convincing data on the effectiveness of these interventions, as well as clear recommendations regarding indications and contraindications for them in various urological diseases in children. All this, in our opinion, determines this direction as promising in pediatric surgery and requires further research.

The purpose of the study is to improve the results of treatment of children with diseases of the upper urinary tract, using retroperitoneal access to perform endovideosurgical operations.

Material and methods

The work is based on the results of surgical treatment of 108 children with various diseases of the upper urinary tract in the Department of Elective Surgery and Urology - Andrology of the Morozov Children's City Clinical Hospital for the period from 2008 to 2016. The main group consisted of patients operated on by endovideosurgical retroperitoneal access, in total 28 children (15 (60.7%) boys, 13 (39.3%) girls) aged 9 months to 17 years (mean age 7.6 ± 5.5 years). For a

comparative analysis of the results of treatment with retroperitoneal access, 2 control groups were involved: the 1st comparison group consisted of patients operated on by laparoscopic access - 50 children (30 (60%) boys, 20 (40%) girls) aged from 8 months to 17 months. years (mean age 7.5 ± 5.4 years). The 2nd comparison group included patients operated on with the traditional open approach (OD), 30 clinical cases in children (16 (60%) boys, 14 (40%) girls) aged 10 months to 17 years (mean age 7.6 ± 5.4 years). All three groups of patients were comparable in age composition.

For the purpose of diagnosis, all children in the clinic underwent a comprehensive examination both in the preoperative and postoperative periods, including the use of clinical, laboratory and instrumental research methods (ultrasound, radiological, radioisotope). At the same time, the algorithm for examining patients was traditional according to the principle from simple to complex.

According to nosological forms, patients of the main group were distributed as follows: with hydronephrosis - 6 (21.4%), solitary kidney cyst - 11 (39.3%), non-functioning kidney due to reflux nephropathy - 6 (21.4%), urolithiasis, calculus of the middle third of the ureter - 5 (17.9%). According to the diseases, patients underwent endovideosurgical retroperitoneal pyeloplasty (6), resection of kidney cysts (11), nephroureterectomy (6), ureterolithotomy (5).

The structure of patients by age and previous surgical interventions in the comparison groups was similar to that in the main group.

In the group of retroperitoneoscopic operations, 2 patients had a history of ventriculo-peritoneal shunt for hydrocephalus.

Open operations were performed using the traditional Fedorov lumbotomy approach. The entire volume of operational actions did not differ from standard methods.

LD and the surgical technique are described repeatedly in the manuals on endoscopic surgery, so we will not dwell on this in detail.

Surgical interventions by retroperitoneoscopic access were performed with the patient in the healthy side position. A roller was placed under the lower back, which created an inclination of the frontal axis of the body, which increased the distance between the costal arch and the iliac crest and thereby somewhat expanded the boundaries of the retroperitoneal space. A 1.5 cm incision was made in the skin and subcutaneous fat midway between the 12th rib and the iliac wing at the level of the posterior axillary line. The muscles were stratified in a blunt way with the jaws of the clamp. The transverse fascia was dissected, the fatty tissue of the retroperitoneal space and Gerota's fascia were opened. To create a working space in 10 cases, a self-made dissector balloon was used - a finger was cut off from a sterile rubber glove, put on the end part of a 10-mm trocar, and hermetically fixed with a thread. The balloon was inflated in the retroperitoneal space with air using a pear or Janet syringe. In 4 observations, the working space was formed using a tupper. In 14 surgical interventions, a manual method was used to create a primary working cavity using the index finger. The first 10 mm trocar with optics and CO₂ insufflation was inserted into the created cavity, thus expanding the working space. Then, under visual control, a second 5 mm trocar was placed in the costovertebral angle. The third manipulation trocar was placed along the anterior axillary line. The projection of its introduction depended on the zone of surgical interest in the retroperitoneal space. The surgical techniques used in retroperitoneoscopic interventions did not differ from the methods of open and laparoscopic operations.

When analyzing the results of treatment, the following indicators were evaluated, reflecting the degree of aggressiveness of surgical interventions: the duration of the operation, the amount of

blood loss, the need for narcotic analgesics after the operation, the terms of rehabilitation (activation) of the patient in the postoperative period, the length of the patient's stay in the hospital after the operation, the presence or absence of intraoperative and postoperative complications.

results

The duration of surgical interventions by retroperitoneoscopic approach was 125.6 min (45–220), by laparoscopic access – 125.1 min (60–215), OD – 93 min (50–140). Thus, statistical analysis showed that the duration of retroperitoneoscopic operations significantly exceeds that of open interventions ($p < 0.05$). At the same time, the duration of operations in the groups of transperitoneoscopic access and retroperitoneoscopic access did not differ statistically significantly ($p > 0.05$).

We noted that at the initial stages of mastering endovideosurgical interventions by retroperitoneal access, the operations proceeded longer than during subsequent ones. Thus, the first retroperitoneoscopic resection of a solitary kidney cyst lasted 105 minutes, and the last one included in the work - 45 minutes, i.e., as experience is gained and new technical approaches are introduced, the duration of endovideosurgical retroperitoneal interventions gradually approaches the duration of open operations.

In all cases of endovideosurgical operations, blood loss was minimal. The volume of blood loss during retroperitoneoscopic interventions was more than 3 times less compared with open operations ($p < 0.05$). At the same time, the volume of blood loss in the groups of transperitoneoscopic access and retroperitoneoscopic access did not have statistically significant differences ($p > 0.05$).

When performing retroperitoneoscopic operations, we did not note intraoperative complications; there were also no cases of transition to open surgery. In the group of laparoscopic interventions, in 1 (2%) patient with an intrarenal dorsally oriented pelvis of the kidney during pyeloplasty, conversion had to be performed due to insurmountable technical difficulties and the inability to achieve the goal of the operation with the chosen approach.

In the postoperative period, anesthesia was performed with narcotic and non-narcotic analgesics. Since 2010, in open, laparoscopic, and retroperitoneoscopic operations, epidural anesthesia has been resorted to with the introduction of a microfluidic local anesthetic (solution of naropin at an age dosage) into the epidural space through a catheter for 1–2 days, depending on the type of surgical intervention. In the groups of retroperitoneoscopic and laparoscopic operations, non-narcotic analgesics were additionally used for pain relief for more than 1-2 days after the operation. After open interventions, all patients required the use of narcotic analgesics for 1–2 days after surgery, then pain relief was carried out with non-narcotic analgesics for up to 4–5 days.

Significantly earlier activation of patients is associated with a less pronounced pain syndrome. After retroperitoneoscopic and laparoscopic operations, the activation of patients occurred on the average on the 2.4th day. The average period of activation of patients after open surgery was significantly longer and amounted to 3.7 days.

Accordingly, the length of stay of patients of the main group in the hospital after surgery was reduced. The average number of bed-days of hospital stay of patients after retroperitoneoscopic surgery was 5.9 days, after laparoscopic surgery - 5.8 days, after open surgeries - 11.8 days.

These data clearly show that the postoperative period after retroperitoneoscopic and laparoscopic operations is much easier compared to open interventions: pain is less pronounced, the patient is more active and the duration of hospital stay after surgery is shorter.

There were no postoperative complications in the main group. In the group of laparoscopic interventions, urinary leakage was found in 1 (2%) case after pyeloplasty, which served as an indication for the installation of a puncture nephrostomy. In the group of open operations, suppuration of the postoperative wound was noted in 2 (6.7%) children. In the groups of endovideosurgical interventions, healing of trocar wounds by primary intention was observed in 100% of cases, wound suppuration was not observed.

The results of endovideosurgical retroperitoneal operations for diseases of the upper urinary tract were studied in terms of 1 to 3 years in 22 patients. For comparison, 30 patients were examined after laparoscopic operations and 25 after lumbotomy at the same time.

During examination, all patients with hydronephrosis who underwent pyeloplasty by retroperitoneoscopic access showed positive dynamics according to ultrasound data in the form of a reduction in the renal collector system, improvement in intrarenal blood flow, and parenchymal growth. There were no cases of recurrence of the disease and the need for repeated interventions. In the group of laparoscopic interventions, hydronephrosis recurrence was noted in 1 child who had severe bacterial-fungal pyelonephritis in the postoperative period. The patient successfully underwent repeated open pyeloplasty 6 months later.

The results of using retroperitoneoscopic access for resection of kidney cysts were studied over a period of more than 1 year in 8 patients. For comparison, 12 patients were examined after laparoscopic operations and 10 after open interventions. When analyzing the results of the study in the compared groups, there were no cases of cyst recurrence and the need for repeated interventions. After 6 months, with a control ultrasound, the residual cavity of not more than 50% of the initial size of the cyst was determined in 2 patients operated on for OD, and was absent in all patients of the main group and the LD group. In 1 year after the operation, ultrasound involution of the residual cavity was already observed in all patients of the three groups.

When examining patients who underwent ureterolithotomy, there were no complications in the main group and comparison groups. After nephroureterectomy in children of all three groups, we also did not reveal any deviations from the norm.

After lumbotomy, in addition to a distinct scar in the lumbar region, varying degrees of severity of skin sensitivity disorders can be observed. This is due to the fact that small sensitive nerve branches are crossed during access. In our observations, a violation of skin sensitivity below the scar was detected in 2 (8%) patients who underwent open surgery. In patients of the main group and the group of laparoscopic operations, such violations were not observed.

In the long-term period, the formation of a keloid scar was found in 2 (8%) patients operated on for OD. In the main group and the group of laparoscopic interventions, keloid scars were not observed.

After retroperitoneoscopic and laparoscopic operations, a good cosmetic effect was noted - a year after surgery, postoperative scars were barely noticeable white-pink spots after trocar accesses. In the group of traditional interventions, postoperative scars a year after the operation were a smooth, whitish line of lumbotomy access.

Thus, according to our data, the use of endovideosurgical retroperitoneal operations significantly improves the results of surgical treatment of patients compared to traditional

interventions, while the results of retroperitoneoscopic interventions are comparable to those of laparoscopic ones.

Discussion

A comparative analysis of the results of surgical treatment of diseases of the upper urinary tract in children using three approaches - retroperitoneoscopic access, laparoscopic access and open access - showed that the retroperitoneoscopic method in this pathology is comparable in terms of capabilities with open operations, but at the same time has a significant advantage due to less traumatism, shorter terms of rehabilitation and stay of the patient in a hospital after operation. Meanwhile, the duration of the operation was longer with endovideosurgical approaches. However, as experience is gained, this indicator in the group of retroperitoneoscopic interventions is steadily decreasing and is approaching the average duration of traditional operations. At the same time, the results of retroperitoneoscopic and laparoscopic operations did not have significant differences.

Thus, it can be argued that open access operations should be used only if there are contraindications to endovideosurgical interventions or their unavailability.

Each of the endovideosurgical methods (laparoscopic and retroperitoneoscopic) certainly has its own advantages and disadvantages. At the same time, the advantages of one method indicate the disadvantages of the other, and vice versa. Thus, the advantages of the laparoscopic method compared to the retroperitoneoscopic method are a larger volume of the operating space, which provides ease of manipulation, the presence of clear anatomical landmarks, since with retroperitoneoscopic access, on the contrary, a small working cavity leads to technical difficulties in carrying out manipulations, and the absence of distinct anatomical landmarks makes it difficult search for an object with retroperitoneal access. At the same time, the advantages of the retroperitoneoscopic method are a short and direct access to the upper urinary tract, the absence of contact with the abdominal organs, which is especially important in patients with a history of surgical interventions on the abdominal organs. With LD, the path to the retroperitoneal space is longer, there is a risk of mechanical and thermal damage to the abdominal organs, as well as the threat of urinary leakage into the abdominal cavity.

Our experience shows that each of the methods has its own indications and contraindications.

When comparing two approaches for performing resection of a solitary kidney cyst, we noted that it was more convenient to use LD when localizing kidney cysts along the anterior or medial surface of the kidney. Visualization of the cyst was carried out without technical difficulties. When the kidney cyst is located in the dorsolateral sections, the retroperitoneoscopic approach showed greater efficiency, which provided the opportunity for a full examination of the entire cyst cavity, adequate resection of its wall and total electrocoagulation of the cystic lining of the residual cavity, followed by retroperitoneal drainage with minimal time and ergonomic costs, which is difficult to perform laparoscopic access at a given localization of the cyst. Subsequently, with the accumulation of experience, we more often used endovideosurgical retroperitoneal access, which made it possible to remove a cyst of any localization.

The most complex and lengthy operation in our study was retroperitoneoscopic pyeloplasty. However, in the presence of a dorsal orientation of the pelvis, it was the use of retroperitoneoscopic access that ensured the convenience of performing all the manipulations of surgical intervention, and with laparoscopic access, the orientation of the pelvis posteriorly during pyeloplasty caused conversion. Therefore, we consider the presence of a dorsal orientation of the

pelvis as an absolute indication for the use of the retroperitoneoscopic method. At the same time, taking into account the complexity of performing reconstructive operations, their duration, we believe that when the pelvis is oriented anteriorly, it is more expedient to use laparoscopic access.

When performing ureterolithotomies and nephroureterectomies, we did not reveal any differences between the laparoscopic approach and the retroperitoneoscopic approach.

As our experience shows, all factors that complicate or lengthen operations are contraindications to the use of retroperitoneoscopic access, since in the case of performing endovideosurgical interventions in difficult conditions and for a long time, the risk of complications increases, and, in addition, the mini-aggressiveness of surgical intervention becomes doubtful. Such factors are the adhesive process due to previous operations on the organs of the retroperitoneal space, which will prevent the formation of an adequate working cavity and can cause various complications due to the risk of damage to the organs of the urinary system or large vessels, as well as the anatomical features of the kidney, for example, as mentioned above, the direction of the pelvis anteriorly during pyeloplasty, which will significantly complicate the reconstructive operation, or anomalies in the relationship of the kidneys (horseshoe-shaped, gallet-shaped kidney, and others), when the rotation of the pelvis, the presence of an isthmus, features of angioarchitectonics, additional main vessels will complicate surgical intervention or may even make the operation impossible with this access and cause a conversion.

Thus, based on the study, we formulated the following indications and contraindications for retroperitoneoscopic access.

Absolute indications for the use of retroperitoneoscopic access in diseases of the upper urinary tract in children are:

- a history of multiple operations on the abdominal organs; – dorsally oriented renal pelvis in patients with hydronephrosis;
- solitary cyst of the kidney, located on the posterolateral surface of the kidney.

Contraindications:

- previously transferred operations on the organs of the retroperitoneal space;
- orientation of the pelvis anteriorly for pyeloplasty with hydronephrosis;
- anomalies of the kidneys.

In general, our study showed the great potential of endovideosurgical retroperitoneal operations for diseases of the upper urinary tract in children.

Since there is no difference between the laparoscopic approach and the retroperitoneoscopic approach in the considered pathology when assessing the invasiveness of interventions, the choice of approach (with the exception of absolute indications and contraindications) depends on the skills and experience of the surgeon. However, we believe that preference should still be given to the retroperitoneoscopic approach, since it is more physiological, direct, excludes contact with the abdominal organs, and minimizes complications from the abdominal organs.

Conclusion

Thus, endovideosurgical retroperitoneal operations can be successfully used in pediatric surgery for diseases of the upper urinary tract and will improve the results of treatment in comparison with open interventions. At the same time, the results of retroperitoneoscopic interventions are comparable with the results of laparoscopic operations. The authors are convinced of the prospects of further introduction of retroperitoneoscopic operations in the treatment of various urological diseases in children.

REFERENCES:

1. Tsyryak A.G., Sataev V.U., Mamleev I.A., Gumerov A.A., Yenikeev Kh.Yu., Alyangin V.G. Features of retroperitoneal approach at videoretroperitoneoscopic operations in children. *Detskaya khir.* 2008; (3): 21–3. (in Russian)
2. Sataev V.U., Tsyryak A.G., Gumerov A.A., Alyangin V.G., Nasyrov A.R., Mamleev I.A., Enikeev Kh.Yu. The videoretroperitoneoscopic approach in pediatric surgery. *Detskaya khir.* 2011; (2): 28–32. (in Russian)
3. Kiryukhin A.P., Sokolov Yu.Yu. Mini-invasive methods of pre-transplant nephrectomy in children with end-stage kidney disease. *Nefrologiya i dializ.* 2013; 15(4): 258–62. (in Russian)
4. Sokolov Yu.Yu., Zverev D.V., Kiryukhin A.P., Runenko V.I., Pankratenko T.E., Generalova G.A. et al. Endosurgical methods of pre-transplantation nephrectomy in children with terminal stage of chronic renal insufficiency. *Detskaya khir.* 2015; 1: 8–11. (in Russian)
5. Borzi P.A. A comparison of the lateral and posterior retroperitoneoscopic approach for complete and partial nephroureterectomy in children. *Br. J. Urol.* 2001; 87(6):517–20.
6. Valla J.S. Retroperitoneoscopic surgery in children. *Semin. Pediatr. Surg.* 2007; 16: 270–7.