

## Experience of Using “Miniature” Access for Pyeloplasty in Children at the «Med Art Group» Clinic

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**Abstract:** Currently laparoscopic pyeloplasty is becoming increasingly popular in pediatric urology because it is less invasive compared to standard open pyeloplasty. However, the main criticism of this pyeloplasty technique in children is that there are some difficulties with tissue adjustment and intracorporeal suturing due to limited space. In addition, the duration of surgical intervention is a significant disadvantage of laparoscopic pyeloplasty, especially in children of the younger age group. Despite all the advantages associated with minimal invasiveness, there are alternative surgical treatments that show very impressive results. We performed open “miniature” pyeloplasty in a child with congenital hydronephrosis with good functional and cosmetic results. In addition, this approach allows wide exposure of the pelvic-urethral segment of the kidney and facilitates tissue manipulation.

**Keywords:** In congenital hydronephrosis, obstruction of the pyeloureteral segment, pyeloplasty.

### INTRODUCTION

Congenital hydronephrosis (CH), caused by obstruction of the pyelourethral segment of the ureter (PUS), is the most common form of obstructive uropathy in children of the first year of life [1]. W. Krajewski et al. Recently, significant progress has been made in the diagnosis and treatment of CH due to the widespread introduction into medical practice of useful diagnostic methods and highly effective treatment methods [2]. According to E. A., Oliveira et al., there are still many controversial issues regarding the choice of method of surgical correction of PUS obstruction in children [3]. Open dissection pyeloplasty, proposed by Anderson and Hines in the middle of the last century, has for many years been the main method of surgical treatment of abscess obstruction with a high probability of success [4]. Some of the “complaints” associated with this approach include: However, complications such as prolonged postoperative pain, prolonged hospital stays, prolonged recovery, and residual unsightly scars have led to increased interest in minimally invasive alternatives [5]. Therefore, most pediatric urologists have recently avoided large-scale approaches in clinical practice [6-8]. According to F. F. and Honor et al. in young children, a minimal incision approach leads to a rapid recovery of the child and helps reduce the patient’s length of stay in the hospital [9].

### CLINICAL CASE DESCRIPTION

We present our own clinical observation. Patient X. 2 months. Diagnosis: Complicated course of kidney anomaly. Bilateral narrowing of the PUS. Bilateral hydronephrosis. Colic of the left kidney.

Complications of urinary tract infection . ( classification Society of Fetal Urology ) [10] . Obstruction of the pyeloureteral segment.

From the anamnesis: The pathology was detected antenally by ultrasound . After birth, there were no episodes of pyelonephritis (unmotivated rises in temperature, pathological changes in urine tests). During examination: urine and blood tests revealed no pathological changes. According to ultrasound, the dimensions of the right kidney are 51x24 mm. TPP - 8.5mm. ChLS slightly increased by 7.0x5.0 mm. Left kidney 56x30mm TPP-4mm. Cup extended ChLS 20x19mm, cup 21-11-12mm.



**Figure 1.** Sonogram of the left kidney. The thickness of the renal parenchyma is 0.5 mm, the anteroposterior size of the pelvis is 35 mm

Its dimensions are 51x21x23 mm. TPP.8-15mm. FHR is slightly increased. Left kidney 54x21x31mm. TPP-3-14mm. ChLS enlarged formation 35x15mm, calyx 17mm. The function of the left kidney is reduced. The function of the right kidney is preserved.

On March 22, 2024, an operation was performed to dissect the stricture of the left kidney and perform internal stenting of the left ureter using the Anderson-Heinz method.

The operation was performed with the patient positioned on the left side with a bolster in the lumbar region. A 2.0 cm long transverse incision was made ( small flank incision ) by linea axillaris media below the XII rib on the right (Fig. 2). The tissues are cut layer by layer down to the peritoneum. The latter is retracted medially . The pelvis of the right kidney was found and placed on a suture. When isolating the PUS, we tried to minimize the mobilization of the ureter in the distal direction to maintain adequate blood circulation. The stenotic part of the PUS was excised with a longitudinal dissection of the ureter. When performing ureteropyeloanastomosis, a continuous Vicryl 6/0 suture was used. The technique of anastomosis was performed according to the generally accepted Anderson-Hynes technique . In this case, we preferred internal drainage to ureteral double pig tail stent pig tail ". The perinephric space was not drained. The wound was sutured in layers with intradermal sutures. Blood loss less than 5.0 ml.



**Figure 2.** Type of skin incision

To control diuresis and adequate drainage, a Foley catheter No. 6 Ch was installed in the bladder. The duration of the operation was 70 minutes. After the operation, a control survey urography was performed - the location of the stent was adequate. In the postoperative period, the patient did not require opioid analgesics. Recommended for a child verticalization immediately after waking up.

The first day of observation: diuresis through the urinary catheter was 550 ml, which indicates adequate functioning of the ureteral stent, urine color with a slight hemorrhagic tint. Nonsteroidal - anti-inflammatory drugs were discontinued on the 2nd day after surgery.

The child was discharged from the hospital with recommendations on the 3rd day after surgery. During the observation period, no irritative symptoms were noted. Examination one month after surgery: laboratory blood and urine values were within normal limits. The ureteral stent was removed.

## DISCUSSION

After laparoscopic pyeloplasty was first described in 1993 [11, 12], and many publications have appeared on laparoscopic pyeloplasty is almost as effective as traditional open methods. In 2001, CK Yeung et al. reported their first experience with retroperitoneoscopic pyeloplasty in 13 patients [13]. At the same time, the average duration of operations was 143 minutes (from 103 to 235), which is due to the limited working space, which makes it difficult to apply intracorporeal sutures. According to I.M. Kagantsova et al. Laparoscopic resection pyeloplasty with the advantages of minimally invasive surgery gives fairly satisfactory results comparable to the results of open pyeloplasty [14]. The authors believe that laparoscopic pyeloplasty will evolve as the gold standard for the treatment of CH. S.G. Vrublevsky et al. came to the same conclusion in a study that included 90 children with CH aged from 2 months to 17 years [15]. According to the authors, complications occurred in only 4 (4.4%) patients. S.G. Bondarenko and G.G. Abramov believe that laparoscopic Pyeloplasty in infants is technically feasible, does not differ in duration from similar operations in older children, and is accompanied by a minimal number of complications [16]. However, despite the fact that laparoscopic pyeloplasty is recognized as an effective, minimally invasive method of surgical correction of VH with successful results; some authors consider it quite difficult in terms of mastering the surgical technique, especially in young children [17]. Thus, S. Cascio et al., having operated on 11 children under two years of age with CH, obtained recurrent obstruction of the PUS in 2 (17%) patients [18]. In addition, the main difficulty of laparoscopic pyeloplasty is an intracorporeal suture, which helps to lengthen the duration of the operation [19]. In the hope of overcoming the difficulties encountered with laparoscopic pyeloplasty, and in particular with suturing, many authors give preference to minimally invasive open - pyeloplasty [6-8]. AM Kajbafzadeh et al. It is believed that a single incision of 10-15 mm is cosmetically more attractive than 3 or 4 laparoscopic openings with a total length usually exceeding 20

mm [8]. At the same time, according to V. Singh et al. average duration open pyeloplasty with minimal access is 63 minutes, which is very important especially in young children [ 6] . Moreover, K. Job et al . in their study showed that 74 patients with VH operated on by them through a mini-access were discharged from the hospital within 24 hours after surgery [20] . The authors suggest that this open pyeloplasty can be performed as an outpatient procedure. E. Ruiz et al. claim that none of the patients - operated on with a mini-access required opioid medications in the postoperative period [7] . Currently, the experience of laparoscopic pyeloplasty in children in our country is not great. This may be due to both the technical complexity of performing laparoscopic approaches in children and the available instruments and the possibility of video technology. In the presented clinical case, the child underwent reconstructive plastic surgery using a minimally invasive “miniature ” approach with a 20 mm incision without any drainage tubes, which allowed the patient to be discharged from the hospital on the 3rd day after surgery. We obtained good results in the early postoperative period: rapid recovery of the child, complete elimination of obstruction at the level of the PUS, no need for analgesics, and no large, unaesthetic postoperative scars.

## CONCLUSION

It should be noted that “miniature” open pyeloplasty in children can be a highly effective, safe, technically easy to perform and cosmetic method of surgical correction of PUS obstruction, which ensures minimal patient stay in the hospital.

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