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MINIMALLY INVASIVE TREATMENT OF UROLITHIASIS IN CHILDREN

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Abstract. Contact and remote lithotripsy for urolithiasis of various localizations is a promising alternative to traditional “open” operations in children of all age groups. Provided that the children’s hospital has adequate technical equipment, world standards for the treatment of urolithiasis, adopted in adult practice, can be effectively used in pediatric urology.

Keywords: urolithiasis, method, treatment, diagnosis.

INTRODUCTION

Ureterocele is a pathological intravesical formation, which is an intramural section of the ureter dilated in the form of a cyst, which is usually caused by obstruction of the orifice and is accompanied by ureterohydronephrosis. Orthotopic ureterocele occurs in a non-duplicated ureter, the orifice of which is located in the usual place, ectopic ureterocele always corresponds to an additional ureter of a double kidney. Depending on the urodynamic disorders of the upper urinary tract, three degrees of ectopic ureterocele are distinguished. Depending on the degree of ectopia of the additional orifice, ureterocele can be vesical, urethral and prolapsed. The latter is often the cause of infravesical obstruction. The incidence rate is 1:3500 newborns, the ratio of boys to girls is 1:4. Antenatal diagnosis of ureterocele is based on the use of sonography. The sensitivity of the method is from 60 to 80%, diagnosis is possible from the 16th week of gestation. Diagnostic markers are the presence of a cystic formation in the lumen of the bladder, dilation of the ureter and collecting system of the kidney, as well as oligohydramnios in case of complication of infravesical obstruction [1].

MATERIALS AND METHODS

After the birth of the child, the pathology can be detected by ultrasound screening, which visualizes the intravesical anechoic formation. Among the radiopaque methods of examination, the leading role is given to excretory urography, which allows to determine the filling defect of the bladder corresponding to ureterocele, as well as the dilated ureter and the dilated calyceal-pelvic system of the affected kidney or its additional segment. An indication for surgical treatment of ureterocele in the early stages is the presence of obstructive syndrome. Dissection of the ureterocele is performed at the base with the formation of a free outflow of urine from the ureter. Operations can be performed by the open method with additional antireflux protection according to Gregoire. The operation of choice, in our opinion, regardless of the age group, is endoscopic correction. The latter is performed using diathermocoagulation or high-energy laser against the background of filling the bladder with a 5% glucose solution. The criterion for the effectiveness of the neostoma in this case is the possibility of passing a 9 Ch cystoscope through it. In the case of preserved renal function,

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dissection of the ureterocele is a method of radical correction. In the absence of function of the renal segment, this operation is regarded as the first stage of surgical correction of the malformation in order to decompress the urinary tract and prevent recurrent infection. If the function of the affected segment does not improve within 6-12 months, heminephrureterectomy is performed as the second stage [2].

RESULTS AND DISCUSSION

Ureteroscopy involves endoscopic insertion through the urethra and bladder into the ureter to visualize and extract or fragment stones using laser lithotripsy. With advancements in miniaturized ureteroscopes, URS is increasingly used in pediatric patients, especially for distal and mid-ureteral stones.

Advantages:

Direct visualization and access

High stone-free rates

Useful for impacted stones

Complications:

Ureteral trauma or stricture

Post-operative hematuria

Need for stent placement

Retrograde Intrarenal Surgery (RIRS)

RIRS extends the URS approach into the renal collecting system using flexible ureteroscopes. It is especially useful for treating intrarenal stones that are difficult to manage with ESWL. Pediatric adaptations include smaller-diameter scopes and laser energy adjustments to protect renal tissues.

Indications:

Stones in lower pole calyces

Failed ESWL

Anatomic abnormalities

Considerations:

Requires high expertise

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Pre-operative stenting may be necessary to dilate the ureter

PCNL is reserved for large (>2 cm) or complex renal calculi. Through a small incision in the back, instruments are passed directly into the kidney to fragment and remove stones. In children, mini-PCNL or micro-PCNL has been developed to minimize trauma [3].

Advantages:

High success rates for large stones

Fewer sessions needed than ESWL

Risks:

Bleeding

Injury to surrounding organs

Need for post-op nephrostomy tube

Successful stone removal must be followed by preventive care. This includes metabolic evaluation, dietary modification (increased hydration, reduced sodium and oxalate intake), and monitoring with ultrasound to detect recurrence. Long-term follow-up is essential due to high recurrence rates in pediatric urolithiasis [4].

CONCLUSION

Children with congenital ureterocele are subject to early surgical treatment in order to relieve the renal collecting system and prevent further progressive damage. Minimally invasive intervention is the operation of choice in newborns regardless of the type, nature and degree of ureterocele. In the future, all children after correction of the defect in the early period are subject to mandatory dynamic observation and control examination.

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