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Surgical treatment of UPJO with pyelonephrosis in children

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Abstract

In 2022, we treat 2 children with hydronephrosis and pyonephrosis, 1 with primary ureteropelvic junction obstruction and 1 with recurrent obstruction after laparoscopic pyeloplasty. All children have purulent pyelonephritis and urinary abdomen. After comprehensive anti-infection+abdominal drainage +renal pelvis drainage, the infection was significantly improved, and they were cured and discharged after pyeloplasty under general anesthesia. Conclusion: UPJO complicated with pyonephrosis in children is rare, and the most important treatment principle for hydronephrosis complicated with pyonephrosis is adequate drainage. Comprehensive anti-infection + open drainage infection treatment and control followed by conventional pyeloplasty can cure as soon as possible and return to normal life. It has the advantages of good safety effect and easy promotion.

1. Introduction

In 2022, our department admitted 2 children with hydronephrosis and purulent kidneys. They are 10 years old and 13 years old, both boys out of the district. All are subject to epidemic control and postpone the appointment of hospital elective surgery. The cases are described below:

Case 1: At the age of 10, he found that hydronephrosis worsened during the follow-up of congenital pyelonephrenal junction obstruction, and was ready to be admitted to the hospital for surgery at the scheduled time, because the epidemic was controlled and the hospitalization appointment was delayed. Sudden abdominal pain during waiting, frequent urinary pain, emergency admission to the hospital. After completing the examination, the diagnosis is: left side of moderate to severe hydronephrosis, purulent kidneys, intraperitoneal effusion, urinary tract infection. Intraperitoneal catheterization indwelling is given

for continuous drainage, and 2 weeks after anti-infective treatment is rechecked for color ultrasound + urine routine blood test awareness infection control according to the results of etiological examination. General anesthesia is given with a left hypo costal oblique incision for pyelectroplasty. Conventional indwelling pyelostomy tubes, ureteral stent tubes, perirenal drainage tubes, abdominal drainage tubes. Continued to fight the infection, recovered and discharged from the hospital.

Case 2: At the age of 13, he was discharged from the hospital in July 2021 after left UPJO laparoscopic pyeloplasty. Half a year after the operation, hematuria was hospitalized for conservative treatment after kidney trauma for 10 days and discharged from the hospital. After 3 months, abdominal pain suddenly occurred, and color ultrasound examination showed 0.6cm of pyelonecle stones and moderate to severe hydronephrosis. Hospitalized anti-infective, alkalized urine, antispasmodic, oral sodium potassium bi citrate granules. Infection control is followed by general anesthesia cystoscopic retrograde placement of the ureteral stent. Re-examination of color ultrasound after treatment: mild hydronephrosis, no stones. Pull out the ureter stent tube at a later date. In 2022, the epidemic situation in the nearby area was repeated, and the district where the child was located and the district where my hospital was located were successively controlled. In March, the child suddenly suffered from abdominal pain and difficulty urinating, and was transferred to the pediatric surgery department of our hospital according to the epidemic control policy, and the color ultrasound: severe hydronephrosis, a large amount of ascites. Urinalysis: pusuria. Blood test: severe infection. Local anesthesia is given with a catheter, drainage is purulent ascites and then turns into urinary ascites. After consultation with the Faculty of Pharmacy, after treatment with restrictive antibiotics, alkalizing urine, antispasmodic, etc., followed by a re-examination of color ultrasound, urine test, etc., indicating that the infection has improved, general anesthesia is given transcystoscopic retrograde ureteral stent catheterization. Swelling of the opening and entire section of the ureter was found during the operation, and intubation was difficult. Postoperative filming suggests: ureteral fistula may be possible. We urgently Pyeloplasty under general anesthesia. Intraoperative exploration: ureteral intact, severe UPJO. Pyeloplasty is given. Conventional indwelling pyelostomy tubes, ureteral stent tubes, perirenal drainage tubes, abdominal drainage tubes. Continued to fight the infection, recovered and discharged from the hospital.

2. MATERIALS AND METHODS

Both children were drained by peritoneal puncture indwelling rubber tube under local infiltrative anesthesia. In the second case, the child was indwelled with a double J tube under ureteroscopy under general anesthesia, and was treated with anti-infection, alkalized urine, antispasmodic treatment after infection control. Both are selectively down for left pyeloplasty.

Surgical methodsThe first case of the child, seen intraoperatively: The volume of the left kidney is significantly enlarged, the hydronephrosis in the kidneys. The renal pelvis is thickened by about 4mm and is located at the renal phylum, expanding and hydrops. The renal pelvis ureteral junction is narrow, about 10 mm long, and about 300 ml of clear yellow liquid is drained after opening the pyeloneum. **Surgical procedure**After satisfactory general anesthesia, indwelling catheterization was performed, the patient was placed in the right

lateral position, and the waist was elevated. The left 12-rib oblique incision is about 6 cm long, which is cut layer by layer and separated into the perirenal fascia. Separate the perirenal fascia to fully expose the renal pelvis ureteral junction. The upper and lower levels of the renal pelvis incision and ureteral stenosis were marked with sutures, and 1.5 cm of the ureteropelvic junction was removed for pathological examination. The No. 5 ureteral stent can be successfully implanted into the ureter 15cm downward, and 20ml of methylene blue sodium chloride solution was injected rapidly. No reflux was observed and it was seen to be discharged into the urine bag. The posterior wall of the upper ureter was cut longitudinally for 2 cm, and 5/0 absorbable suture was used to suture the lower pole of the left renal pelvis incision and the ureter. Before the suture completed, an external ureteral stent tube (double J tube) was implanted to lead out the external skin for fixation. The indwelling pyelostomy tube was placed outside the body and fixed. The renal pelvis incision was closed with continuous suture with 4/0 absorbable suture. The indwelling perirenal drainage tube was led out of the body and fixed.

The second case, seen intraoperatively. The volume of the left kidney is significantly increased, the hydronephrosis in the kidney, and the adhesion scar of the renal ureteral anastomosis in the past is obvious and difficult to separate. Open the renal pelvis and drain about 100 ml of clear and clear urine. The entire ureter develops well. Examination of the abdominal segment of the ureter, the pelvic segment, no ureteral leaks, no stent exposed. Cystoscopy shows a small amount of white flocculents in the bladder, the mucous membrane is healthy, the bilateral ureters have bladder openings in place, and the ureteral stent tubes are mostly located in the bladder and removed. A combination of suddenly and sharpness carefully separates the adhesions between the renal pelvisal junction and the surrounding tissues, and fully exposes the renal pelvisal junction. The upper and lower levels of the renal pelvis incision and ureteral stenosis were marked with sutures. 1.5 cm of scar segment of the stenosis of the renal pelvis ureteral junction was removed and pathological examination was sent. The urethra no. 10 can be smoothly implanted down into the ureter 25cm, rapid injection of 20ml of methylene blue sodium chloride solution, no reflux is seen and can be seen to be excreted into the urine bag, no leakage in the surgical field, excluding ureteral leakage and distal obstruction. The follow-up surgical steps are the same as the first case of appeal.

3. RESULT

Two children had a around the kidneys drainage tube pulled out three days after surgery. 7 days to remove the ureter stent. On the 8th day, the nephrostomy tube was injected with methylene blue, and the nephrostomy tube was pulled out on the 10th day after seeing the blue urine, and he was cured and discharged from the hospital. After discharge, follow-up for half a year, the examination of color ultrasound shows that the hydronephrosis is obvious reduced compared with the preoperative period, the renal parenchyma is gradually restored, and the urine routine is normal. Comparative diagram of the efficacy of hydronephrosis

4. DISCUSSION

Congenital pyeloneal ureteral junction obstruction (UPJO) is the most common cause of hydronephrosis in children, and early detection and surgical treatment can effectively



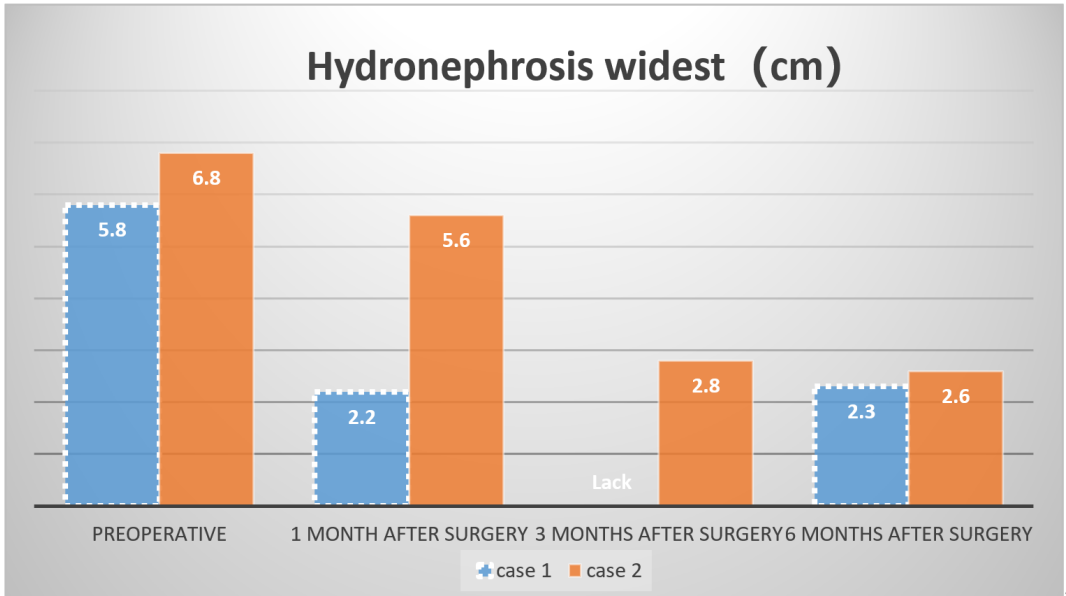
Figure 1. Hydronephrosis incision, position



Figure 2. renal pelvis ureter

preserve and restore renal function[1][2].In children with UPJO, renal ureteroplasty with renal preservation is safe and feasible, and postoperative renal function can be further improved[2].Detached pyeloplasty is the standard procedure for the treatment of UPJO, and the efficacy is confirmed[3].UPJO's common surgical modality is the open Anderson-Hynes procedure.Experienced doctors can choose laparoscopic surgery, laparoscopic and robotic-assisted surgery to achieve the same results[4].However, for patients with pyelonephritis or severe adhesions with a surgical history, it is safer and more reliable to choose the open classical surgical method.Of all the open surgical modalities,dismembered pyeloplasty is currently the best choice for cure UPJO[5].

Of course, there is still controversy about whether to place a stent tube or a nephrostomy tube during surgery.And more and more scholars believe that the placement of the built-in stent tube helps drain urine to prevent the advantages of extravasation, ureter distortion, and



anastomotic stenosis. Internal stent tube plus nephrostomy increases the risk of postoperative urinary tract infection[6]. Children with UPJO complicated purulent kidneys are rare, 2 children with hydronephrosis and purulent kidneys admitted to our department are boys outside the district, and all of them are postponed by the epidemic control to make an appointment for elective surgery in hospitalization. Children with UPJO complicated purulent kidneys are rare[7][8]. Appealed two cases of comprehensive anti-infection, abdominal catheter indwelling open drainage, infection control followed by conventional pyeloplasty. After the operation, the anti-infection continued, and the extubation was cured and discharged from the hospital. The follow-up of the children recovered well, and there were no complications such as urinary tract infections and urinary tract stones in the later stage. Due to the infection or surgery of severe adhesions to the perrenal pelvis tissues in the two children, laparoscopic pylectomy has great difficulties[9]. Priority is given to open classical surgical methods that are safer and more reliable. Secondly, the external drainage tube does not need to be re-operated to remove the built-in double J tube, which alleviates the painful experience of the child's re-admission surgery and also reduces the economic loss of the patient[10]. In addition, the peristalsis of the ureter is significantly weakened or disappeared after the placement of the double J tube, and the anti-reflux mechanism of the ureteral opening will also disappear, which is likely to induce vesicoureteral reflux on the affected side[11]. Severe cases may even lead to anastomosis leakage and re-operation. There are also studies that have shown that the built-in double J tube may cause infection, bleeding, secondary stones, or urinary fistula, and the incidence is positively correlated with the duration of indwelling[12][13]. These two children are more suitable for external stent tube and nephrostomy tube drainage, and the postoperative strengthening of nursing care can reduce or even avoid the possibility of tubing shedding or causing infection. The advantages of external drainage are that the

perirenal drainage tube has a short indwelling time, and the tube can be extated in about 3 days, and the amount and properties of the drainage fluid can be intuitively observed during indwelling to facilitate the judgment of whether the anastomotic mouth is bleeding and leakage of urine[14].Ureteral stent tubes can both support and act as drainage; The pyelography tube drains the urine of the renal pelvis to prevent excessive pressure in the renal pelvis from causing leaks, ruptures, and bleeding from the anastomotic mouth, resulting in the failure of the operation.

Based on the current reports at home and abroad, the most effective surgical means for the control of purulent kidney infection is still drainage, combined with the postoperative recovery of the child, so we choose the traditional surgical method to ensure better drainage.

The second case was a case of relapsed re-obstruction with purulent kidneys after UPJO surgery, which is rare and difficult to harmonize standard treatment for recurrent UPJO. The existing literature reports that the methods of re-obstruction after pyeloplasty include balloon dilation, endoscopic stenosis, inferior calyx with ureteral anastomosis, reposition the double J tubes, puncture nephrostomy, enteral ureteral anastomosis, appendix ureteral mosaic, and re-pyeloplasty[15][16][17]. Among them, balloon dilation, endoscopic stenosis incision due to the size of the instrument type and the tender, brittleness and fineness of the children's ureter, etc., are seriously limited in pediatric applications and are difficult to promote. Placement of a double J tube or nephrostomy tube is a palliative treatment for re-obstruction[18]. These two techniques are clinically applied in children and adults, but there is no obvious effect on the outcome of the disease, and the effect is significantly worse than that of re-pyeloplasty and infrarenal ureteral anastomosis. In this case, after postoperative trauma and then obstruction, cystoscopic built-in double J tube, anti-infection treatment after improvement and once recurrence of obstructive infection, another built-in double J tube at the same time abdominal drainage, anti-infection and other treatment, infection control but hydronephrosis did not alleviate. At this point, the follow-up secondary reconstructive surgery is the time. Secondary reconstructive surgery (eg, re-pyeloplasty, infrarenal ureteral anastomosis, appendix ureteral transplantation, etc.) is the main and most effective means of restoring urine patency[19][20]. They are also the current method of choice for the treatment of postoperative re-obstruction in children. As a classic surgical method, open pyeloplasty can have a cure rate of up to 90% or more for re-obstruction, and the clinical recognition of the popularize and efficacy of the operation has been given high[21].

In conclusion, UPJO complicated with pyonephrosis in children is rare, and the most important treatment principle for hydronephrosis complicated with pyonephrosis is adequate drainage. Comprehensive anti-infection + open drainage infection treatment and control followed by conventional pyeloplasty can cure as soon as possible and return to normal life. It has the advantages of good safety effect and easy promotion.

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