Pyeloplasty in Children 兒童腎盂成形術

What is a Pelvi-ureteric junction obstruction?

Pelvi-ureteric junction (PUJ) obstruction is a condition when there is a blockage in one of the ureters at the level where they meet the kidneys, resulting in dilated renal pelvis (hydronephrosis). Most cases are now diagnosed prenatally by ultrasound. If the condition is not detected before birth, a child may have blood in the urine, urinary tract infection, abdominal pain or masses. For those suspicious cases, some imaging tests would be arranged to confirm the diagnosis and determine its severity.

The condition is usually present from birth, but occasionally may appear later. If the ureter remains blocked, the kidney could become swollen and even damaged. Most commonly, it is due to a congenital narrowing of the ureter. Sometimes, the blockage is caused by blood vessels getting in the way of the ureter or rarely compression of the ureter by a tumour.

As the degree of obstruction varies widely, patient would have variable clinical presentation and subsequent management. It can be safely watched if it resolves spontaneously. For those severe cases, it would be best treated with surgery.

What is a Pyeloplasty?

A pyeloplasty is an operation to remove the narrow part of one of the ureters where they meet the kidneys and re-connecting it to the kidneys. The operation is carried out under general anaesthesia. The operation can be performed either by the open approach or by the laparoscopic means. Surgery usually takes about two to four hours. A child may stay in the hospital for up to several days after this operation.

Laparoscopic pyeloplasty

In general, a small cut (incision) is made at the umbilical or flank region and a laparoscopic port is inserted. A laparoscope (telescope) is then inserted into the abdomen after it is blown up by carbon dioxide gas. Laparoscopic instruments are then inserted via other small cuts in the abdomen for reconstruction to permit normal urine drainage. A tube may be left inside the ureter and/or abdomen temporarily to help with healing. The procedure may take a longer time than conventional open surgery, but children may have shorted hospital stays and faster return to normal activities.

Robotic assisted laparoscopic pyeloplasty

The operation may also be performed laparoscopically using robotic surgery equipment.

Open pyeloplasty

Sometimes the surgeon will not be able to carry out an operation using the keyhole method for various reasons, for example, unexpected findings, technical difficulties, etc. If this is the case, the surgeon will carry out the operation using a larger incision (cut) in his or her side over the kidneys.

Laparoscopic vs Open pyeloplasty?
The blockage can either be removed using keyhole surgery (laparoscopy) or traditional open surgery with overall success of 85-100%. Your surgeon will discuss with you which method is most appropriate for your child.

Preparation before surgery
Your child may need to have various tests and investigations. After admission, you can discuss the operation in detail with the surgeon before signing a consent form. An anaesthetist will also visit you to explain about the anaesthetic risk and pain relief postoperatively. On the day of the operation, your child should not eat or drink for the time specified by the anaesthetists. Please follow these instructions otherwise the operation may need to be postponed or even cancelled.

Care after surgery
It is important to have a proper postoperative patient care as this would affect the overall success of the surgery.

1. Feeding
The child may be able to eat and drink a few hours after the operation whereas infants may go back to breast or formula feedings. For those having inadequate oral intake, intravenous fluid may be required. In the days after the operation, you should encourage your child to drink plenty of fluids to flush out the kidneys.

2. Wound care
There shall be one to a few dressings over the belly which stays on for about a week after surgery. The stitches are usually absorbable, so they do not need to be removed. It is fine for your child to have a shower after the operation, but try to avoid long baths as this may cause some wound problems.

3. Urinary or Foley catheter
A urinary or Foley catheter, which goes through the urethra and into the bladder, will be in place for one to few days after your child has surgery. All the urine that would normally be stored in the bladder drains out through this tube into a urine bag. The catheter will be securely taped to your child's leg.

4. Double-J (JJ) catheter or percutaneous nephrostomy (PCN) tube
Your child may also have another plastic tube sits inside the ureter. It could be placed inside your child’s tummy (JJ catheter connecting kidney and bladder) or brought out from the back (PCN tube & ureteric stent or single specialized nephrostent) so as to give time for the ureter to heal. PCN tube or nephrostent is usually blocked off one to few days after the operation and is usually removed in the ward about one to two weeks later. For those having JJ catheter, it will be removed with a brief cystoscopy (passing a small telescope into the bladder through the urethra) under a short general anaesthesia four to eight weeks later usually after your child has completely healed.

5. Abdominal drain

Occasionally, a drain may be attached to the belly, close to the incision. It takes away extra fluid that may have collected during surgery. It will be stitched in place and is usually removed before your child goes home.

6. Wound pain control

It is quite normal for your child to feel uncomfortable in early days after the operation. There are several ways to control a child's pain. The one used will depend on your child's age and what he/ she needs. The pain medication can be given by mouth or directly through your child's intravenous tube or injected intramuscularly. The nurse will check your child's pain control regularly and you can feedback to us if you think your child's pain is not being well managed.

7. Bladder spasm management

Catheters and tubes may irritate the bladder and cause spasms (sudden tightening of the bladder), which can be quite painful. If your child has painful bladder spasms, he/she will be given a special drug which helps the bladder relax and reduces the pain.

8. Antibiotics

Usually intravenous antibiotics will be given in the initial postoperative period. After your child goes home, you may be advised to continue to take the antibiotics to prevent any infection developing.

9. Ambulation, Discharge and Follow-up plan

You can encourage your child to get up and move around after surgery though vigorous exercises shall be avoided. The child shall be discharged from the hospital as appropriate and shall come back for follow-ups. Your child can go back to school when he or she feels well again, but should avoid tumble play and contact sports for one to few months. Follow-up imaging studies and subsequent catheter management (if any) shall be arranged on the out-patient clinics. You should call the ward or your family doctor if you believe there are problems related to the wound, tube or general well-being of your child.

Complications

Overall, pyeloplasty in children is a safe operation and serious complications are uncommon. Nevertheless, a number of potential complications may occur. Parents shall discuss with their surgeons should these complications arise:

General -

1. Bleeding
2. Wound complications e.g. infection, haematoma, dehiscence, incisional hernia, etc
3. Hypertrophic scar
4. Adhesion

Additional operations / interventions may be needed to handle complications

Specific -

1. Anastomotic leakage
2. Pyelonephritis
3. Recurrent PUJO obstruction
4. Cutaneous fistula
5. Further drop in renal function
6. Prolonged ileus
7. Ureteral stent migration / blockage / breakage

Rare but significant (if any) -

1. Injury to major vessels, small bowel, large bowel, omentum, ovary, fallopian tube, urinary bladder and other intra-abdominal organs
2. Torrential bleeding

Additional operations / interventions may be needed to handle complications

Remarks

This is general information only and the list of complications is not exhaustive. Other unforeseen complications may occasionally occur. In special patient groups, the actual risk may be different. For further information, please contact your doctor.