PAEDIATRIC UROLOGY

Paediatric urology is an important component of urological practice. The following are some of the common paediatric urology conditions seen in Malaysia.

HYDRONEPHROSIS:

Hydronephrosis or “water inside the kidneys” is dilatation of the urinary tract by urine. If the urinary passage (ureter) is dilated as well, it is known as HYDROURETER. Hydronephrosis is probably the commonest abnormality detected by antenatal ultrasound. Most of the antenatal hydronephrosis is physiological. However, one needs to follow them up with serial ultrasounds to rule out an underlying obstruction.

PUV, posterior urethral valve:

If both kidneys have hydronephrosis, the situation is more urgent because bilateral obstructed kidneys can lead to kidney failure. The most important condition not to be missed in a male neonate with bilateral hydronephrosis is the condition known as PUV, posterior urethral valve. PUV can be diagnosed with an x-ray (MCUG, micturition cystourethrogram). When diagnosed, the bladder requires immediate drainage with a catheter and the valve can be fulgrated, within weeks of delivery.

The following pictures show the x-ray of a valve before and after treatment.

Endoscopic pictures show the valve being fulgrated with an endoscopic device, specially designed for the neonatal penis.
However, the PUV has already caused obstruction in utero and more than 50% of PUV patients have life long bladder dysfunction and some degree of kidney failure.

**VUR, vesico ureteric reflux**

The other cause of bilateral hydronephrosis is that of vesico-ureteric reflux of urine. Again, this can be diagnosed with a MCUG. Reflux does not usually require surgical treatment as most cases will improve as the child grows. However, for high grade of reflux in a neonate, the child should be on a prophylactic antibiotic to prevent urinary tract infection, UTI which can cause kidney scars. For a child with reflux, the urine must be cultured for bacteria and given a therapeutic course of antibiotics, as an emergency, if the child has a febrile UTI. For children with recurrent febrile UTIs, the reflux can be reduced with endoscopic injection (e.g. Deflux, as illustrated in the attached diagram) or even by a surgical ureteric re-implantation to correct the anatomical cause of the reflux.

![Diagram](image)

*Fig. 7. Deflux® is injected below the refluxing ureteral orifice until a prominent bulge appears, and the orifice has assumed a crescent-like shape.*
PUJO, pelvi-ureteric junction obstruction or UVJO, uretero-vesical junction obstruction:

Unilateral hydronephrosis can be due to an obstruction at the pelvi-ureteric junction, PUJ. If there is hydroureter, the obstruction may be at the UVJ, uretero-vesical junction. Only about 1/3 of such cases will eventually have severe enough obstruction to require surgery. Therefore, the initial management of hydronephrosis is to follow them up with serial ultrasounds, to measure especially the anterior posterior diameter (APD) of the kidney pelvis (should be less than 15 mm). The kidney function can also be followed up with serial radio isotope scans to ensure that it does not fall below 30% of the total function.

Corrective surgery (called “pyeloplasty”) is to remove the narrow PUJO with reconstruction as follows, A, B, C:

Other ultrasonographic pictures which may appear like hydronephrosis include multicycstic dysplastic disease of the kidneys. If this is unilateral it does not affect the overall kidney function. The multiple cysts shrink as the child grows.

PAEDIATRIC INGUINAL SCROTAL SURGERY:

As in adults, a common cause of an inguinal scrotal swelling is an inguinal hernia. Abdominal contents may prolapse through the patent hernia orifice, especially with crying. Once a hernia is diagnosed, it should be operated as soon as possible, in case it strangulates. If an inguinal scrotal swelling which is suspected to be a hernia becomes irreducible and the child is in distress with vomiting, it becomes a surgical emergency.

Another common cause of a scrotal swelling is that of a hydrocele, which is “water in a cavity”. Fluid content can be confirmed with the transillumination test or with a simple ultrasound. Fifty percent of hydrocele resolves by 2 years of age. Thereafter, the patent processus that drain fluid into the hydrocele can be closed with elective surgery, a procedure called “herniotomy”.

About 10% of new borns also have undescended testis, UDT. However, by the age of 1 year, only 1% of testis remain undescended. Therefore, it is better to wait until 1 year of age before surgery. Hormonal production and subsequent sex in adult life is usually not affected by undescended testes. However, in bilateral UDT, fertility is reduced. When there is bilateral UDT and ambiguous genitalia, it is a matter of urgency to establish the sex of the child, usually by chromosomal studies. The undescended testis can be brought into the scrotum, taking particular care to preserve the blood supply to the testis.
Fifteen percent of adolescent boys have a left sided varicocele. The varicocele is an enlargement of the veins in the upper scrotum, often described as “bag of worms”. Adolescent varicocele seldom require surgical treatment, unless it causes a pressure effect, e.g. atrophy of the testis. Particular care has to be taken during surgery such that the other structures e.g. the lymphatics, vas and artery to the testis are not disturbed by the surgery.

**CIRCUMCISION:**

Circumcision is one of the commonest operations in children. An important medical indication for circumcision is that of phimosis. Phimosis is the narrowing of the preputial opening, often giving rise to ballooning of the prepuce at urination (see picture below).
HYPOSPADIAS:

Hypospadias is a congenital defect of the urethra in a boy that results in the urethral opening on the underside (“hypo”) of the penis. It is often associated with a bent penis, a condition known as CHORDEE, as illustrated below:

Hypospadias occurs in about 1 in 2,500 live births. Hypospadias surgery is complicated and remains a specialised surgical practice worldwide. The available skin and soft tissue is used to correct the deformity and therefore, children with hypospadias should never have a routine circumcision. Surgery for hypospadias often requires multi-stage repairs. The main aim of the surgery is to have a straight penis and also to allow the boy to stand to pass urine. The defect can be corrected as soon as possible, usually between the ages of 1 and 3 years.

BLADDER BOWEL DYSFUNCTION, BBD:

Bladder bowel dysfunction in children is a common condition. In children with neurological abnormalities, the diagnosis is obvious. There is a decreasing incidence of spina bifida as most antenatal mothers have supplemental folic acid. However, spina bifida is still a common birth defect, with 1 in every 1,000 births. Obvious spina bifida would require urgent intervention by the neurosurgeon and subsequent follow-up by the neurologist, paediatrician, and orthopaedic surgeon. It is important to treat any constipation as well, with behavioural, dietary and laxatives e.g. Lactulose. The neuropathic bladder would need to be followed up with ultrasound and urodynamic studies. If the child is unable to empty the bladder well, a standard treatment is that of CIC, clean intermittent catheterisation.

DUPLEX URINARY SYSTEMS:

A duplex urinary tract is reputedly the commonest incidental anomaly seen on imaging of the urinary tract. They are mostly asymptomatic. In children, the duplex urinary tract can cause classical symptoms. If a girl has a mass in the introitus and has urinary retention, a commonest cause is that of a ureteroecele. The bladder can be drained by a catheter as an emergency. Symptomatic ureteroceles can be decompressed by a transurethral resection, the classical fish mouth resection, to resect just sufficient of ureterocoele to allow the urine to drain out, see diagram below.
If a girl has only 1 symptom of continuous urinary incontinence of a small amount, it may be due to an abnormally low insertion of a duplex ureter. To cure the situation would require surgery to remove that part of the duplex urinary tract.

**PAEDIATRIC URINARY STONES:**

Paediatric urinary stone is still endemic in developing countries. Patients with recurrent UTIs or blood in the urine should be investigated with ultrasound to rule out an underlying stone. Multiple large primary bladder stones can be removed by open surgery. Stones in the kidneys and ureter can be treated by lithotripsy, as in adults.

**ENURESIS:**

10-15% of 5 year old children have enuresis, commonly known as *BED WETTING*. It is a benign condition and by the age of 15 years, the incidence dropped to 1%. Nevertheless, enuresis is a stressful condition to the child and family. The management would consist of lifestyle modifications, including reducing fluid intake at night. A hormone (Minirin) may also be administered at night, to reduce the urine output.

**CONCLUSION:**

The above paediatric urological conditions are best managed as a team approach by the urologist, with the primary paediatrician, paediatric surgeon and nurses.

*Written by Dr Clarence Lei Chang Moh, 29 July 2013.*