

## Pediatric Conditions Hydronephrosis

### What is hydronephrosis?

Hydronephrosis (hydro = water, nephros = kidney) is a condition in which there is abnormal swelling of the kidney. This condition does not always result in damage of the kidney. In some cases, the condition resolves itself when the kidney matures further. However, there are other causes of hydronephrosis that may result in kidney damage, especially during the early years when the kidney is still developing. Therefore, it is important to identify and treat these potentially risky conditions early.

In children, the most common causes of hydronephrosis that may result in kidney damage are:

- Vesicoureteral reflux: abnormal backflow of urine from the bladder toward the kidney, thus increasing the risk of kidney infections.
- Obstruction (blockage) of the urinary tract: This occurs at several levels –
  - *Ureteropelvic Junction (UPJ)*: This is the segment where the kidney basin drains into the ureter.
  - *Ureterovesical Junction (UVJ)*: This is the segment where the ureter enters the bladder.
  - *Urethra*: Obstruction at this level most commonly occurs just outside the bladder (*posterior urethral valves*). As it affects the bladder and both kidneys at the same time, it tends to cause the most severe damage to the entire urinary tract.

### Symptoms

Hydronephrosis can damage the kidney through abnormally high pressure in the kidney and infections. Symptoms that suggest kidney disease include back and abdominal pain, vomiting, blood in the urine, and fever. It is important to note that children may not have symptoms even when hydronephrosis is significant.

### Diagnosing Hydronephrosis

Kidney and bladder ultrasound is the best test to diagnose hydronephrosis in children.

When hydronephrosis is detected in the fetus prior to birth, it is called *antenatal hydronephrosis*. It is often helpful for the expectant mother to consult a pediatric urologist to plan for the management of the baby after birth and to coordinate the additional studies that the baby will need to evaluate the urinary tract in more detail.

The other situation that a kidney ultrasound is done is to evaluate the child that has urinary symptoms.

Additional tests may be necessary. These include:

- Voiding Cystourethrogram (VCUG) – This study tests for reflux, looks at the shape and size of the bladder, and looks at the urethra for possible obstruction.
- Kidney (Renal) Scan – This study shows the kidney function relative to each other and to detect damage to the kidney. When special medications are given, it can also help determine the degree of obstruction.

## **Treatment**

The treatment for hydronephrosis depends on its cause and its severity. Often, close follow up over several months to several years may be necessary to assure that the kidney problem improves adequately. In some cases, the child may be given an antibiotic to take daily to help prevent kidney infections until the kidney gets better by itself or until successful surgery.

Many children with vesicoureteral reflux will outgrow it without surgery. Most children with hydronephrosis but without reflux or obstruction will also outgrow it.

A child may need surgery for hydronephrosis when significant obstruction is present, or when it causes symptoms such as significant pain, infection, or bleeding in the urine.

Most surgeries for conditions that cause hydronephrosis can be done very successfully, although some children require more than one operation. Even after successful surgery, close follow-up is important. With adequate treatment, most children will grow up to be normal adults without functional limitations.