

RADIOLOGY

THE DILATED COLLECTING SYSTEM - 2

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Non-obstructive dilation of the urinary tract

In the previous issue, we saw dilatation of the collecting system due to calculi, pelviureteric or vesicoureteric junction obstruction. Dilatation, however, does not always imply obstruction. It is a common observation when the bladder is overfull. If there is persistent dilatation in post void scan, it indicates obstruction. Bilateral mild hydroureteronephrosis is also seen in polyuric states like diabetes mellitus. Awareness of this can prevent unnecessary investigations.

In Fig.1 there is dilated pelvicalyceal system in intravenous urogram which is often mistaken for a pelviureteric junction obstruction. The calyces are rounded and dilated while the pelvis (PUJ) is triangular and not dilated. This is termed as megacalycosis and if there are more number of calyces, sometimes as many as twenty, it is called polymegacalycosis. Fig.2 is the ultrasound picture



Fig. 1. Megacalycosis-IVU

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Fig.2. Megacalycosis-USG



Fig.3. PUJ obstruction

of the same condition, showing a pelvis that is less dilated than the calyces. In other words, the pelvis is not dilated in proportion to the calyceal dilatation. Polymegacalycosis is a dysplasia of the calyces. There is no PUJ obstruction and there is good clearance of the contrast in the later films of intravenous urogram (IVU). The washout pattern in renal scintigraphy is normal. The kidney may be large for age. The cortical tissue around the abnormal calyces is normal in thickness. There is no scarring unless there are bouts of urinary tract infection (UTI) pyelonephritis. The condition is usually diagnosed because of its complications like calculi formation and UTI. Contrast this with PUJ obstruction in Fig.3. The part just proximal to point of block bears the brunt of the obstruction. The pelvis is therefore very much distended.

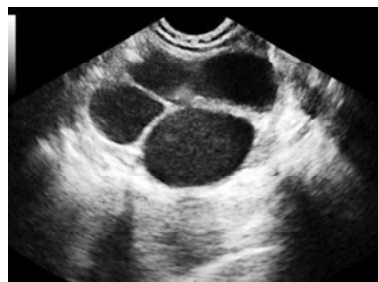


Fig.4. Multicystic dysplastic kidney

Fig.4. shows a kidney consisting of cystic shadows and can easily be mistaken for the pelvicalyceal dilatation in an obstructed kidney. Careful scanning will show that the cysts do not communicate with each other. This is multicystic dysplastic kidney (MCDK). In PUJ obstruction there is a medially placed pelvis communicating with the calyces which are placed laterally, unless there is an associated rotational anomaly. In MCDK, the larger cyst is placed laterally. The MCDK does not carry out excretory function and is known to naturally involute.

It should be remembered that the ureter that is not dilated is not visualised. Ureteric dilatation should always be viewed with suspicion. It is not only signifies obstruction



Fig.5. MCU-Grade 5 VUR

but may also be a pointer to vesico-ureteric reflux (VUR). When VUR occurs in a setting of UTI, it may trigger a cascade of events consisting of pyelonephritis, scarring and reflux nephropathy. Therefore all children with UTI are advised ultrasound of the abdomen to look for dilation of the pelvicalyceal system (PCS) or ureter. If present, further evaluation, treatment and follow-up are necessary.

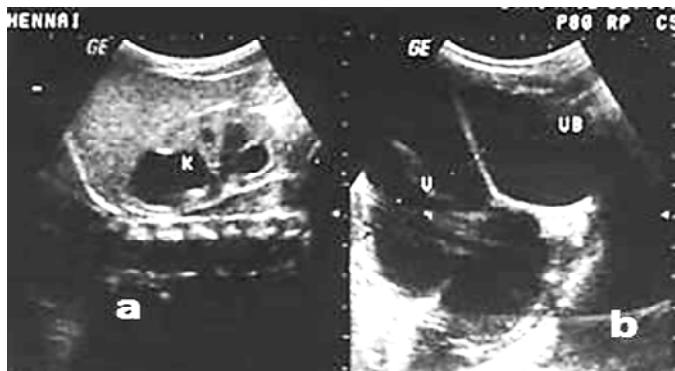


Fig.6a & b.Prune belly syndrome. (UB – bladder and U- ureter)

The gold standard for establishing the presence of reflux is the micturating cysto urethrogram (MCU). This is best done after confirming a sterile urine culture. In this test, contrast and saline are injected into the bladder and films are taken during voiding. The retrograde regurgitation of contrast into the ureter or into the PCS is vesico-ureteric reflux. VUR is graded depending on the level to which reflux is seen and to the state of dilatation of the urinary tract. Grade 1 is reflux of contrast into the lower ureter only. There is no dilation. Grade 2 is reflux of contrast into the pelvicalyceal system and ureter. In grade 3 reflux, the ureter and renal pelvis are mildly dilated. In grade 4 there is blunting of calyces or the calyces lose their normal concavity and the ureter becomes mildly dilated and tortuous. In grade 5 reflux (Fig.5) the ureters are severely dilated and tortuous and the calyces are very much dilated and ballooned out. Therefore the dilatation of the urinary tract in VUR can mimic distal obstruction.

Fig.6a. shows dilated calyces and pelvis and 6b shows grossly dilated and tortuous ureters behind the bladder. The ureteric dilatation is grossly out of proportion to the dilated PCS. This appearance is seen in the rare prune-belly syndrome even when there is no obstruction to urine flow.

CLIPPINGS

Pathophysiology of COVID 19 as per current understanding.

While the pathophysiology of this condition is currently unknown, a structural analysis suggests that the virus may be able to bind to the angiotensin-converting enzyme-2 (ACE2) receptor in humans, which suggests that it may have a similar pathogenesis to SARS. However, a unique structural feature of the spike glycoprotein receptor binding domain of SARS-CoV-2 (which is responsible for the entry of the virus into host cells) confers potentially higher binding affinity for ACE2 on host cells compared to SARS-CoV.

Nicholas JB, Tom EF, Robert F. BMJ Best Practice. The BMJ Publishing Group Ltd. web version last updated: Mar 02, 2020. Bestpractice.bmj.com . BMJ Publishing Group Ltd 2020. P6-7.