Autosomal Dominant Polycystic Kidney Disease and Pain: Radiologist’s Perspective

Sir,
The review article by Dr. Badani and colleagues entitled ‘Autosomal dominant polycystic kidney disease and pain- a review of the disease from aetiology, evaluation, past surgical treatment options to current practice’ is an interesting one. However, it is silent on the role of radiology. Radiology plays an important role in diagnosis of complications in autosomal dominant polycystic kidney disease (ADPKD) and also lends a helping hand in the treatment. Following is a concise description of role of radiology, both diagnostic and therapeutic, in the management of patients of autosomal polycystic kidney disease and pain.

Pain is a common complaint in patients with ADPKD affecting 60% of patients with an established diagnosis. The kidneys and ureters are well supplied by sympathetic, parasympathetic and sensory afferent fibers. Infection, haemorrhage and nephrolithiasis are causes of acute pain. Chronic pain can be due to stretching of renal capsule or due to mechanical causes.

Ultrasound (USG), Computed Tomography (CT), and Magnetic Resonance Imaging (MRI) are the main radiological modalities for the evaluation of pain in ADPKD. The role of USG is limited in the differentiation of cyst hemorrhage and infection as both the conditions show internal echoes, fluid debris levels and thickened walls. Areas of dystrophic cyst wall calcification and collecting system calculi cannot be differentiated as both present as high-amplitude renal echogenic structures with posterior acoustic shadowing.

Combination of non-contrast and contrast-enhanced CT allows correct diagnosis and differentiation among the various complications affecting patients with ADPKD. Haemorrhagic cysts are hyperdense on non-enhanced images, have sharp contours, imperceptible wall, sharp interface with adjacent parenchyma and no contrast enhancement. Infected cysts are nearly water density or show mildly increased attenuation and reveal wall thickening and enhancement. The thickening and enhancement of peri- and paranephric fasciae, and posterior paranephric space and psoas abscess are other features of infection. However, several such features may be seen in haemorrhagic cysts and, therefore, cysts suspected of infection should always be aspirated to confirm the diagnosis. Presence of intracystic air is highly suggestive of cyst infection. Emphysematous pyelonephritis may complicate acute renal infection in ADPKD and CT scan readily shows such abnormalities. Cyst calcifications can be differentiated from calculi as cyst calcifications can occur in the cyst wall or in the lumen whereas calculi lie within the collecting system.

MRI of uncomplicated cysts in ADPKD shows a low signal intensity on T1WI and high signal intensity on T2WI. Haemorrhagic cysts are usually hyperintense on all sequences. In addition haemorrhagic cysts often show fluid iron levels.

Kidneys of patients with ADPKD usually continue to increase in size even after patients begin dialysis therapy, and the mass effects may lead to severe complications, especially frequent are ischemic colitis, ileus and intestinal perforation. In such patients, transcathter arterial embolisation (TAE) can be done for reducing renal volume as an alternative to surgical and laparoscopic procedures. This is highlighted by the experience of Ubara et al who performed TAE using intravascular coils in 64 patients receiving dialysis therapy. Serious complications were not seen after this treatment, although minor complications as fever and flank pain were observed within the first week after the procedure. They reported significant reduction of renal mass resulting in improvement in quality of life as well as nutritional status. TAE has also been used to treat a case of ADPKD with infection.

Another method to reduce the kidney size is needle aspiration and sclerosing of renal cysts. Percutaneous sclerotherapy may be difficult in ADPKD due to the presence of multiple cysts and the difficulty in identifying those which cause pain, selective ablation (under sonographic guidance) is, however, effective for the management of chronic pain caused by one or a few large cysts.

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