Interesting image

Ectopic supernumerary kidney. A casual finding

Riñón ectópico supernumerario. Un hallazgo incidental

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A supernumerary kidney is defined as a true accessory organ with a collector system, blood circulation and independent encapsulated tissue. In contrast with the horseshoe kidney, this congenital abnormality is extremely rare.  

Kidney development begins in 2 structures during the fifth week of gestation: the distal portion of the wolffian duct in which the collector tubules originate, and the renal pelvis and ureters and the caudal portion of the nephrogenic blastema where the glomerules and tubules originate.  

It has been suggested that the presence of a supernumerary kidney is due to aberrant development of 2 ureteral buds at different points of the wolffian duct in contact with the nephrogenic blastema at 2 different positions. Nonetheless, other authors have suggested that this division may begin in the nephrogenic blastema.  

Fig. 1. Coronal slices of the PET-CT study ((A) PET image; (B) low-dose CT image; (C) fusion PET-CT image), performed 60 min after intravenous injection of 259 MBq (7 mCi) of 18F-FDG, showing active tracer elimination by the supernumerary kidney located in the right pelvic region.

Fig. 2. Images in anterior and posterior projection of the renal scintigraphy obtained 4h after intravenous administration of 185 MBq (5 mCi) of 99mTc-DMSA, showing adequate, homogeneous cortical uptake by the 3 kidneys.
We report the case of an 83-year-old man with no past medical history of interest who was admitted for a toxic syndrome. PET-CT with $^{18}$F-FDG was performed to determine the possible presence of an occult neoplasm. The PET-CT study demonstrated the presence of a supernumerary kidney in the right pelvic region, which, similar to the 2 kidneys located in the normal positions, showed active elimination of $^{18}$F-FDG through an independent ureter, receiving blood circulation from a branch of the left common iliac artery (Fig. 1).

To evaluate renal function of the supernumerary kidney and its relation with the other 2 kidneys, a renal scintigraphy with $^{99m}$Tc-DMSA was carried out.

After calculating the arithmetic mean for each kidney, a relative tubular uptake of 22% was obtained for the right kidney, being 37% for the left kidney and 42% for the ectopic kidney (Fig. 2). Tracer uptake in the 3 kidneys was correct and homogeneous with no cortical lesions.

An isotopic renography was performed with $^{99m}$Tc-MAG3, demonstrating correct uptake and elimination of the tracer by the 3 kidneys (Fig. 3).

Clinical complications have been described in two thirds of the patients with supernumerary kidneys, being frequently associated with a greater incidence of hypertension, hydronephrosis, pyelonephritis, cysts, calculus and neoplasms. Very few cases have reported congenital anomalies associated with the presence of 3 kidneys. These reports include cases of ureteral atresia, atresia of the vagina and complete duplication of the uretra.2,3

In our case there was no evidence of alterations in any of the studies carried out in relation to possible associated complications and/or congenital anomalies. These findings are consistent with the absence of symptomatology of the patient.

The importance of scintigraphic studies in these cases is of note since not only do they provide valuable data regarding renal function but they also allow possible complications to be ruled out.

References