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Renal Pseudotumors

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Summary. Renal pseudotumors will simulate a neoplasm on urography but are histologically composed of normal tissue. Pseudotumoral lesions of the kidney are usually discovered on urography and simulate a neoplasm, but are histologically composed of normal tissue. Various conditions such as foetal lobulation, hypertrophy of the columns of Bertin or large cloisons, nodular compensatory hypertrophy, renal sinus lipomatosis, and compression by blood vessels may simulate tumors of the kidney. It is therefore of the utmost importance to make a clear-cut diagnosis with the help of echography, CT-scan, and in some cases, arteriography.

Because the use of the term renal pseudotumor has become imprecise and confusing, it is appropriate to review the entity and to offer a classification of pseudotumors based on current understanding of renal anatomy and pathology. Renal pseudotumors are usually first detected at excretory urography, but cannot always be differentiated from pathologic entities by this investigation alone. Thus, the definition of a renal pseudotumor is: a simulated or real mass urographically resembling a neoplasm but histologically composed of normal tissue [6]. Pathologic lesions such abcess, hematoma, pyelonephritic alterations are rejected from this classification because they represent a pathologic state. The importance of recognizing the renal pseudotumor is to achieve a correct diagnosis for a benign lesion that simulates a renal mass and requires no treatment.

Renal Parenchymal Cortex

Fetal Lobulation

Persistence of the fetal kidney into adulthood may be easily mistaken for one or more pathologic masses on an IVP. This entity results from incomplete fusion of the fetal renal lobes which is normal at birth but disappears by 4–5 years of age [2]. These lobes correspond to the distribution of the anterior calyces. They may involve either kidney and are recognizable by the multiple cortical sharp indentations along the lateral border of the kidney that occur between underlying calices (Fig. 1). Ultrasonographic or radionuclide imaging may be used if doubt exists about the true nature of this unusually prominent renal lobe [5].

The Columns of Bertin or Large Cloisons

These represent central unfoldings of renal cortical tissue of varying depths within the medulla. They result from the fusion of two adjacent septa into a large column having a double thickness. They appear most frequently in duplex kidneys and the mass effect is most notable in the area between the upper calyx and the lower renal pelvis which corresponds to the fusion of the two embryologically separate nephrogenic blastema [9]. These pseudotumors have also been described as focal cortical hyperplasia, focal renal hypertrophy or cortical island [13] which appear to be quite similar to that produced by Bertin's columns. There is no contour defect like fetal lobulations, the mass effect being entirely an internal one. Because of their characteristic location as well as the vascularity of cortical tissue as opposed to medullary tissue, Bertin's columns appear more dense on intravenous pyelography with tomography (Fig. 2). In the case of hypertrophy of the column of Bertin, an increased density should be seen, due to the increase of normally functioning tissue, especially on nephrotomography [8, 9].

Renal scan is the most important differential diagnostic procedure allowing distinction between hypertrophy of the column of Bertin and tumor [1]. The isotope is excreted solely by glomerular filtration and therefore will be seen on the scan as an increased density localized in the renal tubules. This is not the case in the presence of a tumor or a cyst, where an area of decreased or absent isotope uptake is noted. If angiography is performed for some reason, a curvilinear displacement of interlobar arteries around the mass in association with normal vessels will be seen.

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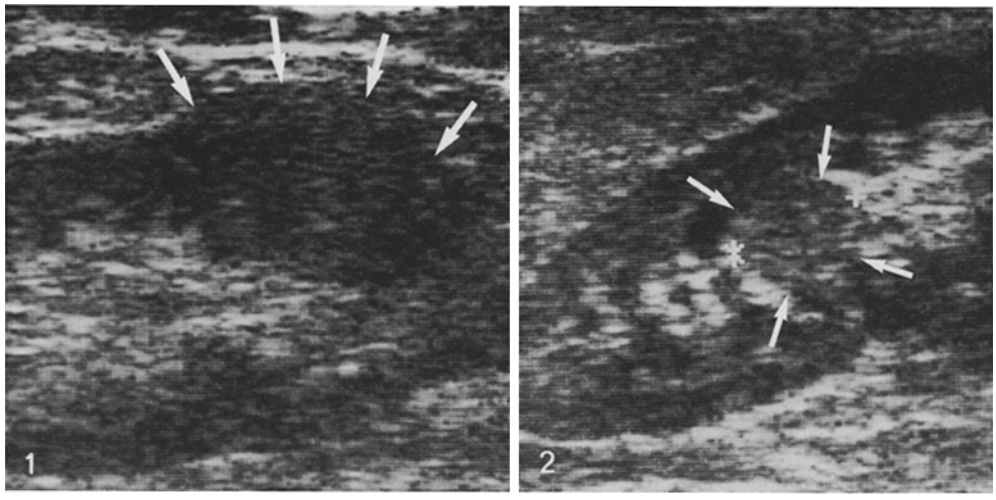

Fig. 1. Longitudinal sonogram of a dromedary hump of the left kidney *(arrows)*. No underlying parenchymal pathology

Fig. 2. Column of Bertin. Longitudinal sonogram of a duplex right kidney demonstrating a mass, same echogenicity as adjacent cortex, between the upper and the lower renal pelves

There is no neovascularity and the normal arteries respond to Epinephrine by contraction of their muscle fibers [8–13].

Nodular Compensatory Hypertrophy

This entity is acquired rather than congenital and occurs in the presence of extensive renal scarring secondary to chronic pyelonephritis, glomerulonephritis, ischemia or trauma. The compensatory hypertrophy is interposed between large segments of scarred kidney and takes on a knob-like contour in which the regenerating nodule may give rise to a pseudotumorous appearance [3]. Ultrasonography and radionuclide imaging will confirm the benign nature of the lesion (Fig. 3). In all cases where ultrasound and scintigraphy are nonconclusive, computerized tomography can be used in the evaluation of renal parenchymal masses [11–14]. Angiography will rarely be necessary to provide the final answer.

Renal Sinus Lipomatosis

Fat, normally present in moderate quantity in the renal sinus, can be found in excessive quantity. The cause for this increased adiposity is not clear, but it seems that this may be part of normal renal senescence of abnormal sinus fat after infection, trauma or infarction of the kidney. This substitution of fat provokes sinus enlarging, elongation and stretching of the renal cavities. Sinus lipomatosis is best demonstrated by nephrotomography. On occasion it is difficult to distinguish renal lipomatosis from parapelvic cysts. Accordingly, ultrasonography is a relatively simple method for distinction between the echo-free pattern of parapelvic cysts and the solid echogenic pattern of sinus fat. Computed tomography gives the same contribution at a higher cost.

Blood Vessels

Arteries and veins can give rise to defects of the collecting system by compression [7]. The difference between this type of compression and a lesion is that it can be recognized by its oblique linear course on IVP. Tomography with the patient in an oblique position will show the disappearance of the "lesion", suggesting the correct diagnosis. With the use of retrograde pyelography under flouroscopy it is often possible to see the affected part of the collecting system pulsate if it is crossed by an artery.

Arteriography will only rarely be needed to make this diagnosis. In addition, renal artery aneurysm can cause urographic abnormalities. At ultrasound examination it should be included in the differential diagnosis of echo-free masses. Angiography is the diagnostic procedure of choice [4].

Recently a case of renal pseudotumor in a patient treated by anticoagulant therapy was reported. In this case a perirenal hematoma simulated a mass lesion [15].

Miscellanous

Recently an ectopic position of the pancreatic tail simulating a solid left renal mass on nephrotomography and ultrasonography has been reported. Computed tomography was necessary to confirm the real etiology of the mass [12]. The spleen can also imitate a left upper pole kidney tumor, especially when it presents variations in position and contour [10].

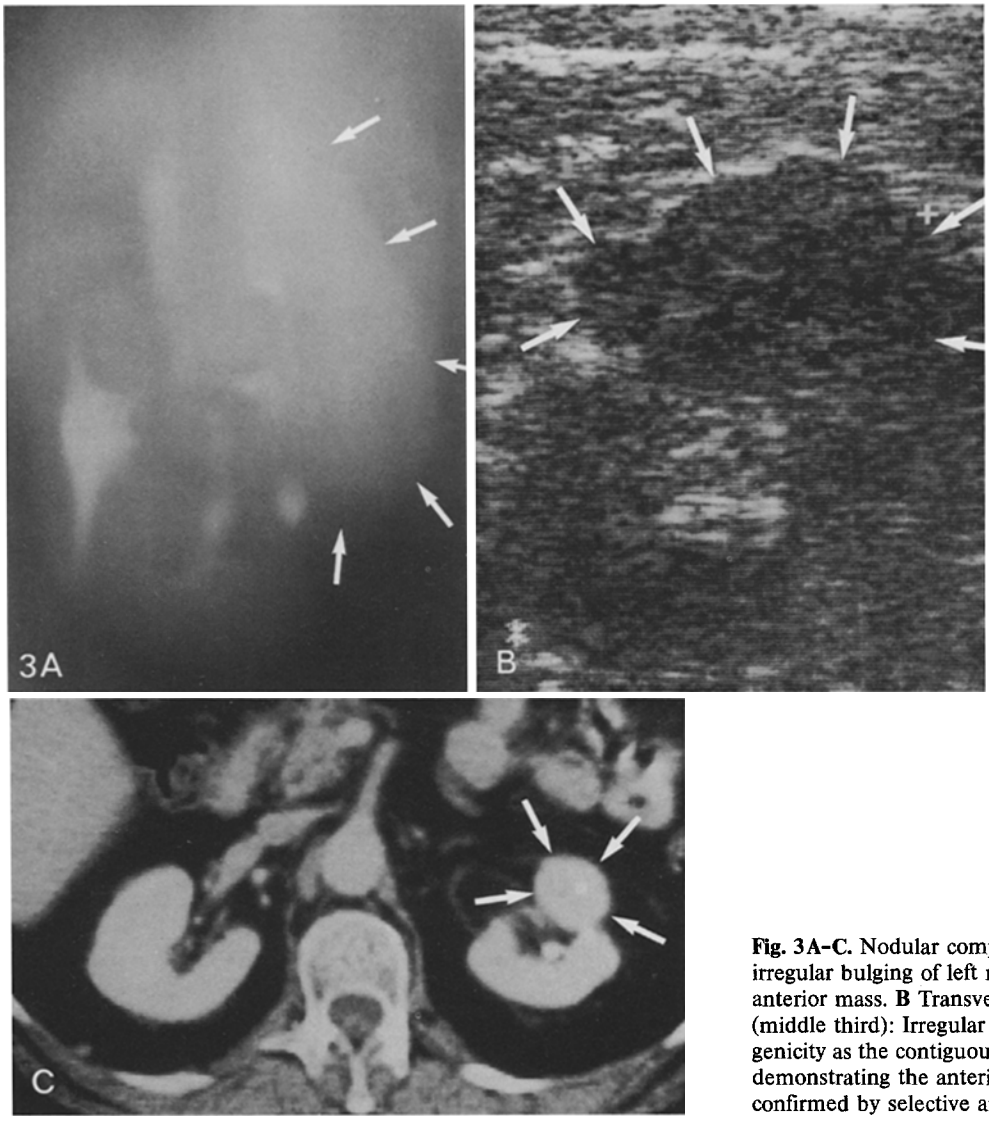

Fig. 3A–C. Nodular compensatory hypertrophy. **A** IVP reveals irregular bulging of left renal outlines *(arrows)* and a possible anterior mass. **B** Transverse sonogram of the left kidney (middle third): Irregular outlined anterior mass, same echogenicity as the contiguous cortex. **C** Contrast enhanced CT-scan demonstrating the anterior isodense pseudomass. Benignity confirmed by selective angiography

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