

ADVANCES IN KIDNEY FOCAL LESIONS- USE OF CONTRAST ENHANCED ULTRASONOGRAPHY

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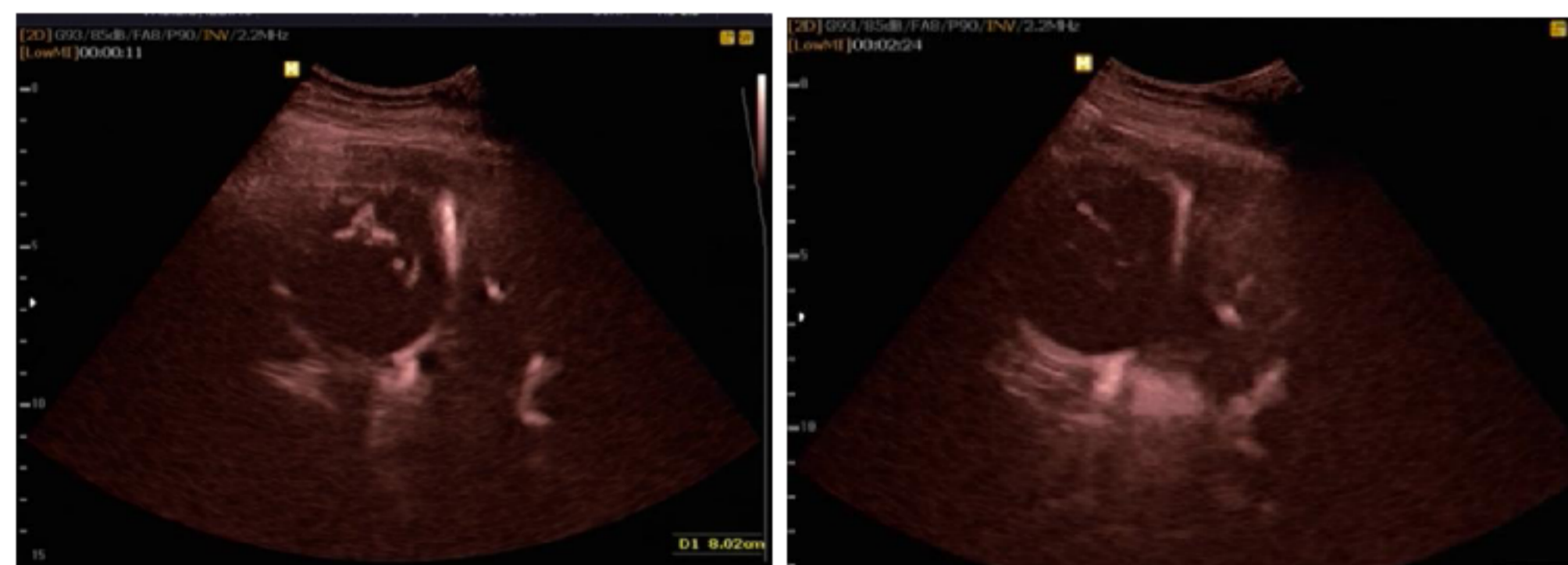
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OBJECTIVES

Contrast enhanced ultrasonography (CEUS) has been an important imaging method initially for liver focal lesions, but also, lately, for kidney focal lesions. In 2011, European Federation of Societies in Ultrasound and Biology establishes the practical guidelines for the use of CEUS in the non-invasive characterisation of kidney cysts, tumors, treatment in renal cell carcinoma, kidney trauma and kidney infarction.

METHODS

In a period of 6 months, we examined in our Nephrology department ten patients with focal kidney lesions that met the criteria for CEUS examination. The characteristics of the patients were: mean age 54 years old, 5/5 men/female distribution. We examined by ultrasonography in grey-scale, Doppler, Power Doppler and CEUS a number of ten kidney lesions. We used a SONOACE X8 Medison ultrasound device, with a convex-array abdominal probe. The contrast examination was made using a special software and the contrast agent was SonoVue, the single contrast agent approved in Romania as a second generation contrast agent. 2,6 ml of contrast agent SonoVue was injected intravenously in bolus. The vascular pattern within the kidney lesion was recorded immediately after injection and three minutes after. We observed the presence of vascular signal within the lesion, in cysts walls.



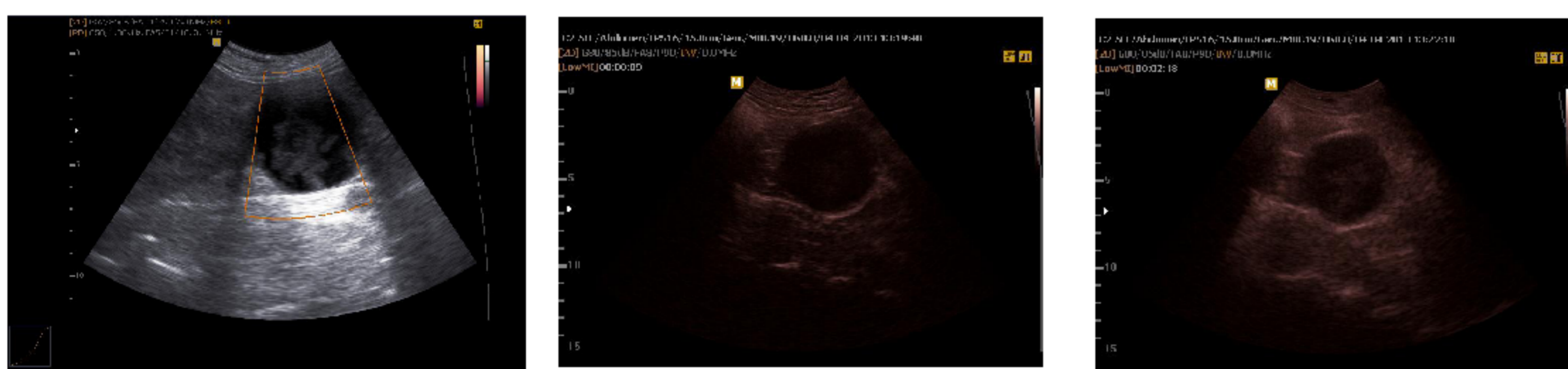
Atypical cyst: septation with intense vascular signal in early phase and rapid wash-out phenomena in the late phase.



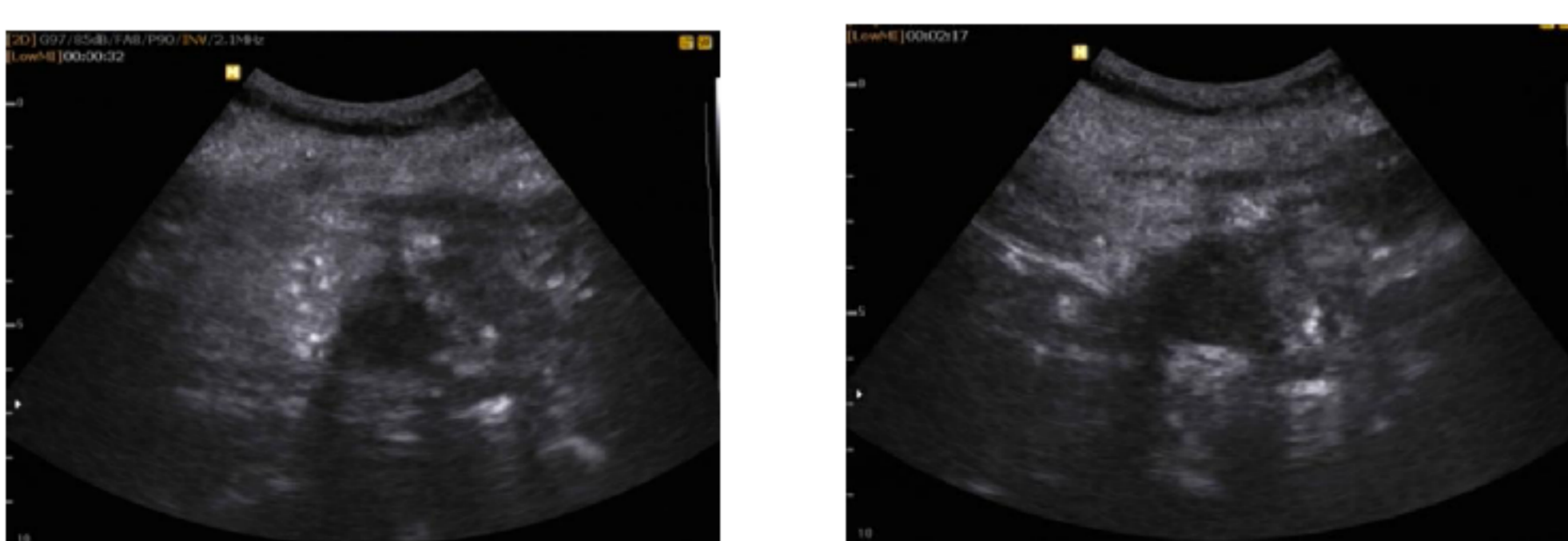
Recurrence after RRC with intense vascular signal in the cortical phase and wash-out in the late phase, with a necrotic avascular area in the tumor.



Benign renal tumor (myolipoma) with an intense enhancement in the cortical phase and persistence of the contrast agent in the late phase.



Collection within the left kidney in a patient with chronic corticotherapy and vascular fragility. Pseudotumoral aspect in Doppler examination, no enhancement in early and late phase, depicting no vascularisation.



Patient with single kidney after RRC and nephrectomy of the right kidney, with a polar cyst in grey scale, no vessels in Doppler examination, but with enhancement of the cyst wall confirmed as RRC recurrence.

RESULTS

We found the following repartition of the kidney lesions: three atypical cysts, two benign lesions, one collection after lumbal trauma and four malignant lesions, one of them being a recurrence after renal cell carcinoma (RRC) in treatment with anti-angiogenetic therapy. From all lesions, six appeared benign in standard, Doppler and CT scan examination before contrast: three cysts and three angioliopomas. After contrast US the diagnosis was confirmed in all ten cases, and the results were confirmed by histopathology. All three cysts showed fine hyperechoic signal of the wall that appeared highly vascular in CEUS and RRC was confirmed. The histology of kidney tumors was RRC. CEUS had a specificity of 100% and sensibility of 100%, with a PPV of 100.

CONCLUSIONS

1. Kidney focal lesions are frequent. Although CT scan and MRI are widely used, ultrasonography is noninvasive and repeatable, but can be improved using contrast agents (CEUS). It has few side effects and can be safely used in chronic kidney disease.
2. Contrast enhanced US has a very good positive predictive value in describing the malign nature of a lesion.
3. It is possible that CEUS will be used also in diffuse kidney diseases, having a very good sensibility in detecting the vascularization within the kidney.

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