Contrast Enhanced Ultrasound (CEUS) efficiency in renal graft complications evaluation☆

Rendimiento de la ecografía con contraste (CEUS) en la valoración de las complicaciones del injerto renal

Dear Editor,

Baseline ultrasound (B-mode, color and pulsed Doppler ultrasound) has been considered the elective imaging diagnostic tool in renal transplantation evaluation,[1] since it enables graft parenchyma, main, segmental and interlobar vessels characterization.

However, it does not offer information about microvascularization, which is usually the underlying cause of graft nephropathy.[2] This is why rejection, acute tubular necrosis (ATN) or drug toxicity diagnosis frequently require a biopsy[3] since their manifestations on baseline ultrasound (US) are frequently non-specific.[4]

Contrast enhanced ultrasound (CEUS) allows real time microcirculation, vascular and tissue graft evaluation by means of intravascular contrast (IVC) administration. It is safe to use in patients with acute renal failure, and has a lower allergic reaction risk than iodinated contrasts.[5]

We present a retrospective, observational, descriptive study that includes all adult patients transplanted in our center from January 2011 to January 2015, in order to evaluate CEUS efficiency in the diagnosis of graft parenchymal and vascular complications.

All patients (mean age: 57.7 years) underwent a first baseline US examination within 24 days post-surgery. An individualized US follow-up schedule was designed upon results of this initial study. In those cases with abnormal findings in B-mode scan (diffuse cortical thickening, focal ecostructure alteration and loss of corticomedullary differentiation), as well as in Doppler US (absence of signal registration, color inversion, loss of diastole, "parvus-tardus" or "aliasing" waveform morphology), an informed consent was obtained in order to administrate 2.4 ml of second generation intravenous ultrasound contrast (sulfur hexafluoride, Sonovue®, Bracco) as protocolled.

CEUS was performed with a premium ultrasound platform (Toshiba Aplio XG®) to obtain qualitative evaluation of the parenchymal graft contrast uptake and vascular enhancement pattern. No complications were observed in any examinations, all of which were performed by the same experienced radiologist.

A total of 27 patients, 15 women and 12 men (out of 131 grafts) presented abnormalities in the baseline US, and CEUS was performed soon thereafter. Six patients presented pathological findings in B-mode, although CEUS did not show significant alterations. These cases corresponded to parenchymal involvement such as acute rejection in one patient (with histological confirmation, Fig. 1) and 5 cases of ATN (lab tests proven).

A total of 25 complications were depicted in the remaining 21 patients: infarction was the most frequent (focal corticomedullary uptake defect after IVC administration), followed by artery stenosis (focal narrowing at the extrarrenal artery) and cortical necrosis (cortical uptake defect with crescent morphology, Fig. 2), then stenosis of the renal vein (focal narrowing of the vein), artery thrombosis (absence of enhancement), arteriovenous fistula (intraparenchymal pseudonodule image with early efferent vein enhancement) and vascular bend (folding vascular structure that adopts hairpin morphology).

Complementary imaging studies included six CT scans without IVC, 4 CT scans with IVC and 3 arteriographies, none of which provided additional information to CEUS.

In patients with B-mode abnormalities, CEUS offered a rapid and reliable diagnosis of renal infarction and cortical necrosis.

In patients with Doppler abnormalities, the CEUS demonstrated in real time stenosis, bends and thrombosis of both renal artery and vein with precise detail of location and extension. Additional imaging modalities based on ionizing radiation[6] or with iodinated contrast agents were not required.

Likewise, CEUS immediately confirmed suspicion of arterial or venous thrombosis, depicting the severity of the lesion and graft's perfusion compromise with the same concordance as the CTs performed.

It should be noted that qualitative assessment of the parenchymal uptake of ultrasound contrast was insufficient for the diagnosis of ATN and rejection, since the CEUS in these

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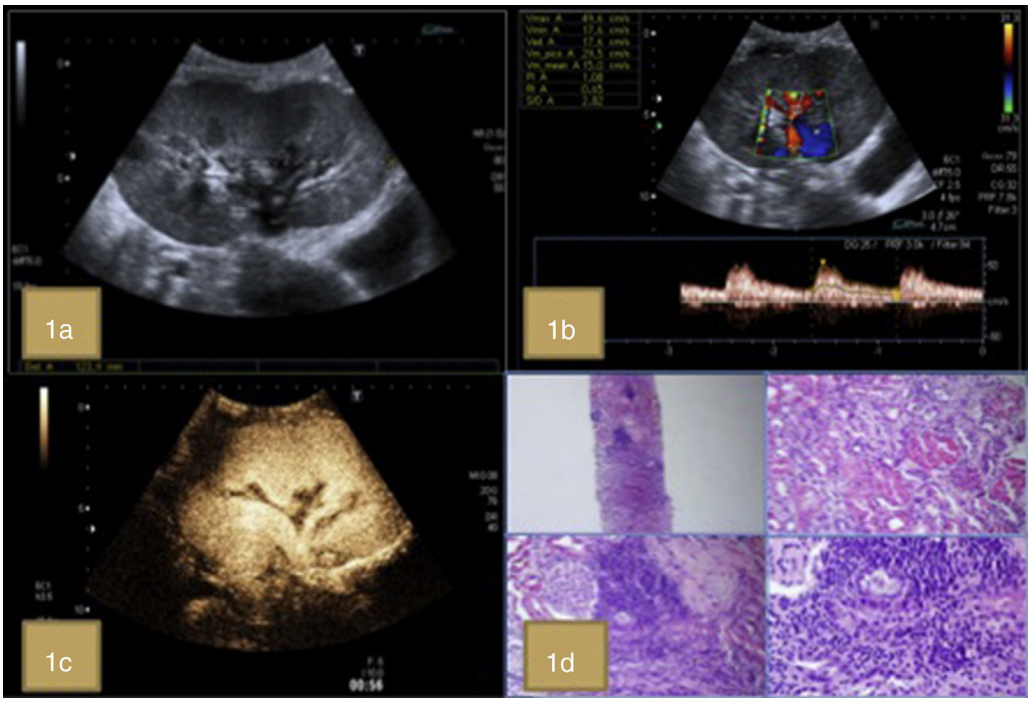

Fig. 1 – (a) B-mode study with cortical thickening and loss of corticomedullary differentiation. (b and c) Pulsed Doppler ultrasound and after administration of IVC without alterations. (d) Banff grade IA acute cellular rejection. The histological sections show a lymphoid infiltrate that affects 25% of the tissue sample (A) with interstitial edema (B) and frequent images of tubulitis (C and D) (H & E).

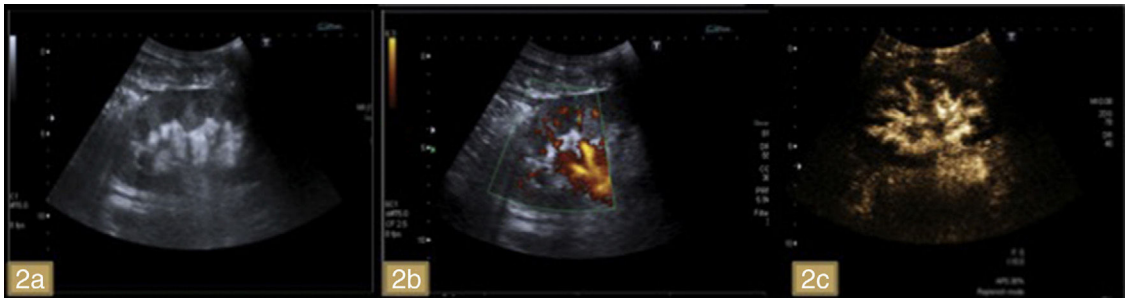

Fig. 2 – (a) Cortical thickening with increased corticomedullary differentiation. Doubtful hypoechoic cortical rim. (b) Absence of marginal vascularization in energy Doppler mode. (c) Absence of cortical uptake in the CEUS study.

patients was normal despite presenting anomalies in the B-mode and Doppler studies.

However, the development of new algorithms for the quantitative assessment of IVC uptake US promises to be an innovative tool for the diagnosis of parenchymal graft dysfunction[2,7] where lab tests can be minimally altered especially in early stages.

Therefore we propose a more complex research with a greater cohort of patients, to confirm these results and provide an answer to this new hypothesis.

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Management of neuroendocrine tumor in a patient with Rubinstein-Taybi syndrome in chronic hemodialysis☆

Manejo de tumor neuroendocrino en paciente con el síndrome de Rubinstein-Taybi en hemodiálisis crónica

Rubinstein-

Taybi syndrome is a systemic disease with variability in its clinical expression. The incidence in the general population is 1/300,000–1/720,000 inhabitants. Mutations have been described in the gene that encodes the transcriptional coactivator binding protein (CREB), mapped in 16p13.3; it is a nuclear protein that participates as a coactivator in gene expression regulated by cyclic AMP. Approximately 25% of the patients diagnosed have a microdeletion in the 16p13.3 region demonstrable by in situ hybridization techniques (FISH).[1–3] It is common for patients to have microcephaly and short stature, a characteristic face (Fig. 1). Other manifestations include hirsutism, chronic gastritis and/or gastroesophageal reflux, cardiac and neurological defects, short stature, ptosis, low implantation ears, colobomas and polydactyly. At the renal level, they may present with renal agenesis, horseshoe kidney, the presence of vesicoureteral reflux, nephritic colic, megaureter, among others. They may present with chronic kidney disease, and with time they need renal replacement therapy.[4–8]

Gastrointestinal discomfort is not uncommon. This is due to reflux and constant food transgressions. Although it is true that they are patients with a higher risk of presenting neoplasms, neuroendocrine tumors are not the most frequent[9] and the clinical picture can be imperceptible, making diagnosis difficult.

We present the clinical case of a 46-year-old male diagnosed with Rubinstein-Taybi syndrome in a chronic hemodialysis program since 19-08-2007. Previously, the patient was in a peritoneal dialysis program from 2004 to 2007, requiring a change of technique in 2007 due to repeated bacterial peritonitis. Kidney transplant from a cadaver donor in June 2010, not functioning due to arterial thrombosis and transplantectomy performed in July 2010. Multiple episodes of self-limiting abdominal pain not necessary associated with frequent admissions, recurrent UTIs that were accompanied on several occasions by constipation, diarrhea and sometimes vomiting. At the renal level, he presented right lower segmental megaureter, ureterohydronephrosis with right ureteral lithiasis. Multiple episodes of renal lithiasis. Left renal hypoplasia. Episode of renal lithiasis in February 2009, assessed by urology that placed double J, with catheter removal on 01-14-2010. A lithotripsy was performed in 2009 at the University Hospital of León with dubious disappearance of ureter dilation in subsequent controls. The surgical history included an inguinal herniorrhaphy, left inguinal hernioplasty, extirpation of the left testis, catheter placement for

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