Case 6014

Nutcracker Syndrome: MRI diagnosis
Published on 15.08.2007

DOI: 10.1594/EURORAD/CASE.6014
ISSN: 1563-4086
Section: Cardiovascular
Case Type: Clinical Cases
Authors: Gavazzi E, Marconi A, Treccani L, Farina D, Maroldi R.
Patient: 16 years, male

Clinical History:

We report the case of a 16 year old male with an incidental finding of proteinuria. Diagnosis of Nutcracker Syndrome was suspected by Doppler ultrasonography and then confirmed by magnetic resonance angiography performed with administration of blood-pool paramagnetic contrast medium.

Imaging Findings:

A moderate degree of proteinuria was incidentally found in a 16 year old male during some check up tests. Renal function parameters were normal and the patient was asymptomatic. Two years before he had undergone surgery for left varicocele. Doppler ultrasonography showed normal renal arteries and an incremented left renal vein diameter in the tract between left renal hilum and abdominal aorta. Magnetic resonance angiography (MRA) was thus performed.

Discussion:

The Nutcracker phenomenon consists of the entrapment of the left renal vein between the aorta and the superior mesenteric artery which arises from abdominal aorta with an anomalous angle (less than 40°; almost 90° in normal subjects) [1]. When this anatomic variant causes symptoms or signs it is referred to as Nutcracker syndrome. Nutcracker syndrome is diagnosed in relatively young and otherwise healthy subjects [2]. More commonly it manifests with abdominal pain associated with intermittent gross or microscopic hematuria. When asymptomatic it may be heralded by proteinuria of variable degree and/or microscopic hematuria. Collateral venous networks - such as a prominent left ovarian or testicular vein - may develop due to left renal vein hypertension [2, 3]. Doppler ultrasonography is the first level imaging technique, in experienced hands it may suspect such anomaly [4]. Final diagnosis can be obtained by non invasive cross sectional imaging techniques. Though MSCT provides an accurate diagnosis, in our opinion MRA should be preferred both because it does not expose to ionizing radiations and because paramagnetic contrast media are generally better tolerated and less nephrotoxic. This is particularly crucial considering the relatively young age of these patients. In addition, the recent introduction of blood-pool agents increased the potential of MRA as these agents allow to obtain excellent enhancement of both arterious and venous system, simultaneously. Treatment of Nutcracker syndrome is still controversial. According to some authors severe persistent or recurrent haematuria, anemia and ureteral passage of blood clots causing abdominal pain make surgery mandatory [2].

Differential Diagnosis List: Nutcracker Syndrome.
Final Diagnosis: Nutcracker Syndrome.

References:


Description: MRA-MPR reconstruction on axial plane (slice thickness 2mm) showing almost complete compression of the left renal vein by superior mesenteric artery. Note the dilatation of the vein proximal to the entrapment site. Origin:
Description: MRA-MPR sagittal reconstruction (slice thickness 2mm) demonstrates the anomalous angle of origin of the superior mesenteric artery, resulting in compression of the left renal vein (arrows).

Origin: