Recurrent hematuria in children without UTI is mainly explained by a glomerulopathy, hypercalciuria/nephrolithiasis, Alport syndrome or nutcracker syndrome. The latter results from compression of the left renal vein between the superior mesenteric artery and the aorta (Fig. 1). Clinical presentation of nutcracker syndrome can vary from asymptomatic hematuria to severe abdominal pain. Mild proteinuria can be associated. Left renal venography is considered to be the gold standard, but is invasive. Doppler ultrasonography can be used as first diagnostic test. However, two cases are presented where nutcracker syndrome was diagnosed with MRA, while Doppler ultrasound showed no abnormalities.

Case Reports

CASE 1:
A 16 years old boy presented with 2 identical episodes of macroscopic hematuria with mild flank pain after viral infection. Symptoms disappeared after 3 days. Inter-episode urine samples showed microscopic hematuria and discrete proteinuria. On Doppler ultrasonography there were no arguments for nutcracker syndrome (Fig. 2) However, MRA revealed compression of the left renal vein between the aorta and superior mesenteric artery (Fig. 3).

CASE 2:
A 7 years old boy presented with a second episode of macroscopic hematuria (without proteinuria) since 1 day. The first episode occurred at the age of 3 years and disappeared after 2 days. Both episodes were identical, with no clinical symptoms besides mild abdominal pain. In both cases the diagnostic work-up for hematuria was performed. Laboratory blood investigations and 24-hour urine collection were within normal ranges. Renal ultrasonography showed no nephrolithiasis. Doppler ultrasonography showed no signs of renal vein compression. MRA did show left renal vein entrapment.

Discussion

Doppler ultrasonography can be used as first diagnostic test for renal vein entrapment, but has a limited sensitivity, especially in children. MRA findings are similar to CT and avoid radiation. In case of recurrent hematuria, a nutcracker syndrome should be excluded before performing a renal biopsy, which is an invasive procedure. Expectation management is appropriate in the great majority of children with confirmed nutcracker syndrome.

Conclusion:
Nutcracker syndrome is a rare cause of recurrent hematuria in children but should always be considered, even when Doppler ultrasonographic assessment shows NO anomalies. By performing a MRA-scan, unnecessary renal biopsies can be avoided in these patients.