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Persistent nephrogram after administration of an isoosmolar contrast medium

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In February 2003, a study by Aspelin *et al.* [1] was published in the NEJM concerning reduced nephrotoxicity using the isoosmolar contrast medium iodixanol in high risk patients.

Case

Recently, we performed a contrast-enhanced thoracic 16-channel multi-slice computed tomography (CT) with intravenous (i.v.) administration of iodixanol [Visipaque, dose 0.5 g I/kg body weight (bw)] in a 73-year old patient, suffering from multiple myeloma and chronic renal failure (calculated creatinine clearance of 23 ml/min). Three days later, an unenhanced CT of the upper abdomen was performed, showing a striking enhancement of the renal parenchyma of both kidneys [mean, 142 hounsfield units (HU)] (Figure 1). No contrast excretion within the collection system was noted. Eight days later there was still residual renal cortical attenuation of both kidneys (67 HU). Unenhanced CT 17 days after the first examination revealed normal findings of both kidneys with complete vanishing of the parenchymal abnormality. The baseline serum creatinine was 2.3 mg/dl (202 µmol/l) and rose to 2.6 mg/dl (235 µmol/l) 4 days after the administration of the contrast media.

Comment

Prolonged renal cortical retention of contrast media is described in the literature as persistent nephrogram and was demonstrated for iodixanol and for other contrast media [2]. Although the exact mechanism of the persistent nephrogram following i.v. administration of iodinated contrast agents is not known, based on animal studies, it has been hypothesized that the contrast medium is retained in the proximal tubular cells by vacuolization. Nevertheless, the major proportion of the contrast agent is excreted by glomerular filtration during the early phase after injection, explaining attenuation of the renal cortical site without detection of the contrast medium in the aorta and the urinary collecting system (Figure 1). The impact of the cortical retention of contrast media on renal function is debatable. While studies using iodixanol in healthy volunteers and in non-diabetic patients with chronic renal failure did not demonstrate any association between persistent cortical attenuation and contrast media-induced nephrotoxicity, authors using contrast media other than iodixanol showed a higher rate of nephrotoxicity in patients with stronger renal cortical retention (CT value >108 HU and >100 HU, respectively).

In our high-risk patient, the administration of iodixanol did not result in significant nephrotoxicity, but in a striking renal cortical retention, a phenomenon that clinicians using iodixanol should be aware of and whose relation to nephrotoxicity will be studied.

Conflict of interest statement. None declared.

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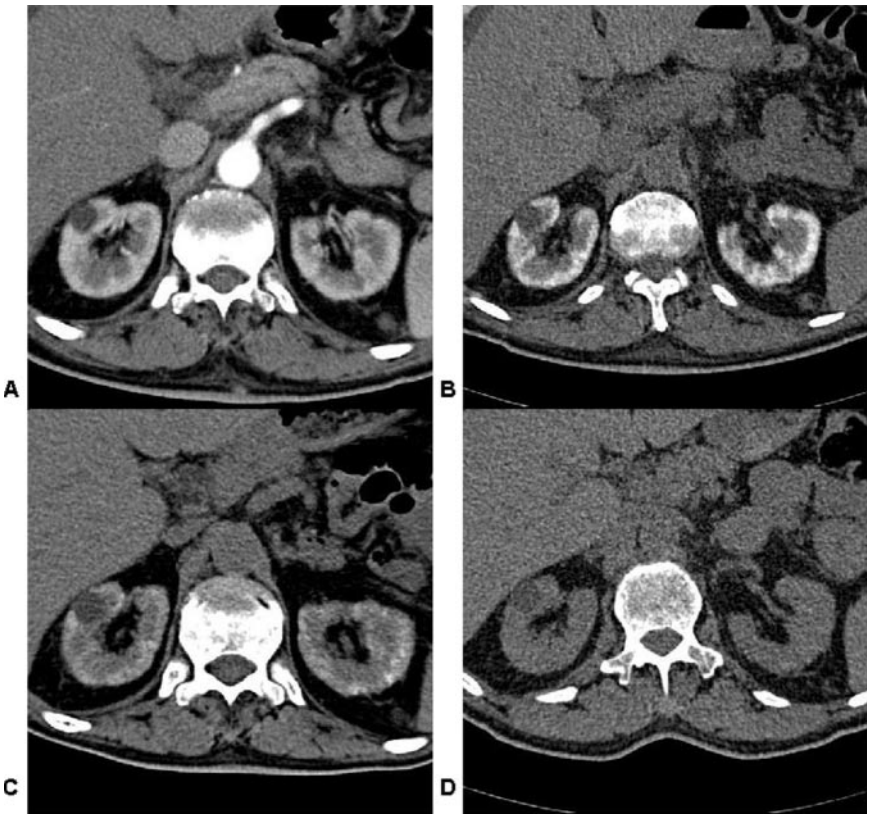

Fig. 1. Axial CT scan of the patient with i.v. administration 0.5 g I/kg bw of iodixanol (**A**) and serial unenhanced CT scans (**B**–**D**) following 3 (B), 8 (C), and 17 days (D) after administration of iodixanol. Dense and regular attenuation of both renal cortices as a sign of persistent renal retention of contrast medium is noted at day 3, with subsequent vanishing of the cortical abnormalities over time.

References

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