

Renal-related perinephric fluid collections: MRI findings

N. Cem Balci^{a,*}, Elif Akun^b, Mehmet Erturk^c, Sezer Saglam^d, Nagihan Inan^a, Yesim Balci^e

^aDepartment of Radiology, SLU, St. Louis, MO 63110, USA

^bDepartment of Internal Medicine, Kadir Has University, Istanbul 36600, Turkey

^cDepartment of Radiology, Sisli Etfal Hospital, Istanbul 64460, Turkey

^dDepartment of Medical Oncology, Istanbul Medical Faculty, Istanbul 29980, Turkey

^eDepartment of Anesthesiology, Istinye Hospital, Istanbul 36460, Turkey

Received 7 October 2004; accepted 11 April 2005

Abstract

We retrospectively reviewed MR studies on 10 patients with renal-related perinephric fluid collections who underwent MRI in three institutions between January 2001 and August 2004. All patients underwent MRI of the abdomen and T1-weighted, T2-weighted and serial contrast-enhanced images, including delayed-phase contrast-enhanced images 10–12 min after contrast injection, were obtained. Perinephric fluid collections in 5 patients revealed MRI findings of simple fluid content (i.e., hypointense on T1-weighted images and hyperintense on T2-weighted images). In another 5 patients, a complex perinephric fluid content (i.e., mixed hyper/hypointense on T1-weighted images and mixed hypo/hyperintense on T2-weighted images compatible with blood breakdown products and pus) was observed. In 5 patients, contrast extravasation on late-phase images that was compatible with urine leak was demonstrated. Our results suggest that MRI may determine the content of perinephric fluid collections on noncontrast T1-weighted and T2-weighted images and that contrast extravasation on late-phase images is associated with urine extravasation from renal collecting systems.

© 2005 Elsevier Inc. All rights reserved.

Keywords: Kidney; Hemorrhage; Urinoma; Urine extravasation

1. Introduction

Retroperitoneal fluid collections in the perinephric spaces are not uncommon. They may contain pus, urine, blood and lymph or transudate fluid resulting from kidney-related pathologies or from retroperitoneal structures [1]. Fluid collections that have communication with the renal parenchyma and collecting system need to be depicted immediately because of the insidious accumulation of renal-related fluid [1–3]. CT has been the method of choice for the assessment of retroperitoneal fluid collections, with a sensitivity of 100% and specificity of 77% [3,4]. However, MRI findings of retroperitoneal fluid collections have also been reported [3]. MRI can evaluate the nature of fluid collections in the abdomen. Differentiation between transudate, abscess and hemorrhage is possible with MRI [3]. It is sensitive for the specific determination of the age of a hemorrhage [5–8]. Nevertheless, MRI findings of renal-

related retroperitoneal fluid collections have not been investigated in larger series. The aim of this study is to describe the spectrum of MRI findings of renal-related perinephric fluid collections.

2. Materials and methods

Over a period of 3 years, we observed 10 patients (6 males and 4 females; age range, 6–78 years) with retroperitoneal fluid collection in the perinephric spaces on MRI. All these patients were referred to MRI after an initial abdominal ultrasound examination that detected perinephric fluid collection. MRI was performed to further investigate the cause of the perirenal fluid collections: 2 patients were under follow-up of known hydronephrosis, 2 had a recent history of blunt abdominal trauma and 4 underwent MRI to rule out spontaneous fornix and/or ureter rupture. One patient underwent fine-needle biopsy of a renal cystic mass. Another patient was undergoing an anticoagulation therapy and had decreased INR levels. All patients underwent surgical intervention to clean up the perinephric fluid.

* Corresponding author.

E-mail address: nc.balci@excite.com (N.C. Balci).

All MR studies were retrospectively reviewed by two investigators (N.C.B. and M.E.). The location, nature and source of the fluid and its association with renal pathologies were assessed in each patient. The signal intensities of the fluid collections were compared with the psoas muscle and considered hypointense if the signal was lower and hyperintense if the signal was higher than the signal of the psoas muscle.

All patients underwent MR examination on a 1.5-T scanner in three institutions [Sonata ($n=5$) and Vision ($n=1$), Siemens Medical Systems, Erlangen, Germany; Signa Horizon ($n=1$), GE Medical Systems, Milwaukee, WI, USA; Intera ($n=3$), Philips Medical Systems, Best, the Netherlands]. Axial T1-weighted breath-hold spoiled gradient echo (SGE) images (TR/TE/FA, 150–180/4.2/80 in phase and 150–180/2.3/80 out of phase) were obtained from all patients; axial T1-weighted breath-hold SGE images with spectral fat suppression (TR/TE/FA, 150–180/4.2/80) were obtained from 7. T2-weighted images included T2-weighted half-Fourier single-shot fast spin echo images obtained with and without fat suppression in the axial plane (TR/TE, ∞ /90) and without fat suppression in the coronal plane ($n=6$), respiratory-gated T2-weighted fast spin echo

images (TR/TE/ETL, 4800/90/8) with fat suppression in the axial plane ($n=1$) and T2-weighted balanced fast field echo (TR/TE/FA, 4.8/2.1/70) images in both axial and coronal planes ($n=8$). Gadolinium chelate (Magnevist, Schering, Berlin, Germany) was administered at a dose of 0.1 mmol/kg as a 5-s hand-injected bolus followed by a rapid flush of 10 ml of normal saline. In-phase SGE (TR/TE/FA, 150–180/4.2/80) images were acquired immediately after contrast administration (arterial phase) and at 45 and 90 s (intermediate phase) and at 7–10 min (delayed phase) after completion of the normal saline flush. Late contrast images were obtained with the use of SGE sequence (TR/TE/FA, 150–180/4.2/80) with ($n=7$) and without ($n=3$) fat suppression in coronal and axial planes in all patients.

3. Results

The perinephric fluid collections were confined in the perirenal space in three patients. In seven patients, perinephric fluid collections were located in more than one compartment: perirenal and anterior pararenal spaces ($n=4$); perirenal and posterior pararenal spaces ($n=2$); and all of the perirenal anterior and posterior pararenal spaces ($n=1$).

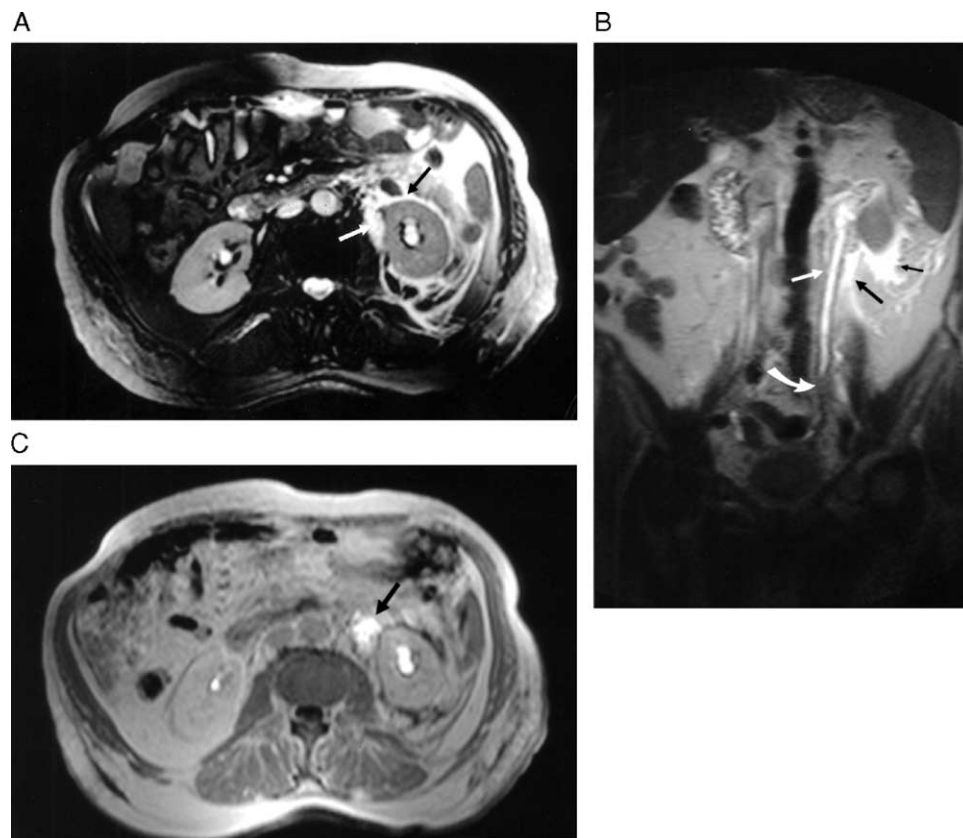


Fig. 1. MRI of a 32-year-old patient who presented with retroperitoneal fibrosis with complicated hydronephrosis on follow-up. (A) Axial T2-weighted balanced fast field echo image (TR/TE/FA, 4.8/2.1/70) showing hyperintense perinephric fluid collection (arrows). (B and C) Coronal T2-weighted half-Fourier single-shot fast spin echo images showing dilated ureter (white straight arrow, B) and the causing retroperitoneal fibrosis (curved arrow, B). The retroperitoneal perinephric fluid collection is also visible (black straight arrows, B). (C) Late contrast-enhanced T1-weighted SGE image (TR/TE/FA, 150/4.2/80) showing retroperitoneal contrast extravasation (arrow).

Download English Version:

<https://daneshyari.com/en/article/10713484>

Download Persian Version:

<https://daneshyari.com/article/10713484>

[Daneshyari.com](https://daneshyari.com)