

# MR HYDROGRAPHY IN THE DIAGNOSIS OF PERITONEAL LEAKS IN CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

V. MARTINEZ SANJUAN<sup>1</sup>, R. GARCIA GARCIA<sup>2</sup>, S. CAMPOS<sup>3,4</sup>, A. ALONSO MANJARRES<sup>2</sup>, A. BULTO<sup>3</sup>, J. ESCOBEDO<sup>5</sup>, J. CELMA MARIN<sup>2</sup>

<sup>1</sup>MR AND CT UNIT, ERESA -HOSPITAL GENERAL UNIVERSITARIO VALENCIA, PICASSENT, VALENCIA, Spain, <sup>2</sup>RADIOLOGY, HOSPITAL GENERAL UNIVERSITARIO DE VALENCIA, VALENCIA, VALENCIA, Spain, <sup>3</sup>MR UNIT, ERESA -HOSPITAL CLINICO UNIVERSITARIO VALENCIA, VALENCIA, VALENCIA, Spain, <sup>4</sup>MR UNIT, ERESA - HOSPITAL CLINICO UNIVERSITARIO DE VALENCIA, VALENCIA, VALENCIA, Spain, <sup>5</sup>NEPHROLOGY, HOSPITAL GENERAL UNIVERSITARIO DE VALENCIA, VALENCIA, VALENCIA, Spain

**OBJECTIVE:** The purpose of this study was to demonstrate the utility of magnetic resonance (MR) hydrography to diagnose and localize abdominal wall leaks among continuous ambulatory peritoneal dialysis (CAPD) patients, using the dialysis solution as a contrast material.

**METHODS:** Four female and three male patients (age range, 46-73 years; mean, 64.5 years) with clinically suspected of peritoneal leaks (abdominal pain, abdominal wall edema, bloody dialysate, herniation, reduced ultrafiltration, etc) were examined on a 1.5-T system (Magnetom Sonata; Siemens Medical Solutions, Erlangen, Germany) using a body-phased-array coil. The MR scanning protocol consisted of the following pulse sequences: 1) a 3-plane localizer (TrueFISP), 2) axial, sagittal and coronal T2-weighted HASTE with and without fat suppression and a slice thickness of 7 mm, 3) axial, coronal and sagittal fat-suppressed TrueFISP (TR 4.3/ TE 2.15/ FA 80, 400mm FOV, 256x205 matrix, 1 Nex, 5mm thickness) and 4) hydrographic images obtained in oblique planes tailored to each patient using either a RARE (TR 2800/ TE 1100/ ETL 256) or a HASTE (TR 3000/ TE 868, FOV 300-400 mm, Thk 10-50 mm, Fat Sat, 256x256, 1 Nex) pulse sequence with both identical FOV (300-400 mm), slice thickness (10-50 mm), matrix size (256x256), number of acquisitions (1) and use of fat suppression. All studies were performed without use of i.v. contrast material, since the dialysis solution offers an excellent positive contrast (hyperintense) on T2-weighted MR images. Therefore, MR-hydrography allows to identify and evaluate the distribution of the dialysis solution within the peritoneal cavity.

**RESULTS:** In all seven cases, abnormal findings in the peritoneal fluid distribution, such as leaks along the hernias, loculated fluid collections within the abdominal cavity, and subcutaneous fluid accumulation were identified. All patient findings are summarized in Table 1.

All of them were also surgically confirmed and repaired. Thus, resulting in a high sensitivity and specificity (100%).

**CONCLUSIONS:** MR hydrography using the dialysis solution as the only contrast medium is a simple and effective noninvasive technique to assess complications of CAPD. In addition, it avoids potential system contamination and thus the risk of peritonitis associated with more invasive techniques such as scintigraphy of the abdomen after intraperitoneal instillation of radioisotope, and CT or MR intraperitoneal contrast administration.

## REFERENCES:

- Prischl FC, Muhr T, Seiringer EM, Funk S et al. J Am Soc Nephrol 2002; 13:197.
- Cochran ST, Do HM, Ronagbi A, Nissenson AR, Kadell BM. Radiographics 1997; 17:869.
- Prokesch RW, Schima W, Schober E, Vychytil A et al. AJR 2000; 174: 987.

Table 1. Findings for continuous ambulatory peritoneal dialysis patients with clinically suspected of peritoneal leaks.

Patient #	Age	Clinical findings	MRI findings
1	60	Abdominal wall edema	Leak in a right inguinal hernia, and subcutaneous fluid accumulation.
2	46	Abdominal pain	Leak through abdominal wall and subcutaneous fluid accumulation.
3	68	Bloody dialysate, reduced ultrafiltration	Leak in a right inguinal hernia, abdominal wall edema, and an eventration at the right flank. Fluid collection found also at the dialysis cateter exit site.
4	71	Scrotal edema	Leak in left inguinal canal and scrotal edema.
5	73	Abdominal wall, scrotal edema	Leaks in both inguinal canals, scrotal edema and abdominal wall edema.
6	63	Abdominal pain	Leak in right inguinal canal.
7	73	Abdominal wall edema, bloody dialysate	Localized abdominal swelling and a fluid collection were found at the dialysis cateter exit site.



Fig. 1.- MR Hydrography in a CAPD patient showing a left leak inguinal hernia