

CASE REPORT

SPECT-CT of peritoneal-scrotal leakage in patients on continuous ambulatory peritoneal dialysis

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Abstract

Peritoneal scintigraphy is a useful radionuclide technique in assessing the drainage function and for evaluating anatomical problems in patients on CAPD. Occasionally a patient on CAPD will present with scrotal swelling when radionuclide technique helps diagnose the cause of the swelling. We present a report of peritoneal scintigraphy in two patients on CAPD with scrotal swelling where the planar and SPECT-CT images demonstrated a connection between the peritoneal cavity and the peri-testicular tunica vaginalis. This is the first report of a SPECT-CT peritoneal scintigram.

Key words: *Scrotal swelling, diasylate leakage, peritoneal scintigraphy*

Introduction

Peritoneal scintigraphy is a useful radionuclide technique in assessing the drainage function and for evaluating anatomical problems in patients on Continuous Ambulatory Peritoneal Dialysis (CAPD).

The occasional association of CAPD and inguinal

hernia [1, 2] necessitates investigation of patients on CAPD who present with testicular swelling with peritoneal scintigraphy in order to correctly identify the underlying cause of the scrotal swelling.

There are multiple causes of scrotal swelling, both systemic and local. However in patients on CAPD, additional factors such as diasylate leakage and volume retention, may contribute to the scrotal swelling. It is therefore essential to determine the exact cause for the scrotal swelling in patients undergoing CAPD in order to institute the appropriate treatment. Diagnosing diasylate leakage will require surgical repair, but if the leakage is excluded, increasing ultrafiltration will most probably resolve the scrotal oedema.

Peritoneal scintigraphy is a valuable test for not only diagnosing the presence of the leak but also for identifying the source of the leakage [3, 4]. We present a report of peritoneal scintigraphy in two patients on CAPD with scrotal swelling where the planar and SPECT-CT images demonstrated a connection between the peritoneal cavity and the peri-testicular tunica vaginalis. This is the first report of a SPECT-CT peritoneal scintigram.

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Case reports

Case 1 A 52-year-old male with end-stage renal disease presented a week after starting CAPD with 1-day history of scrotal swelling.

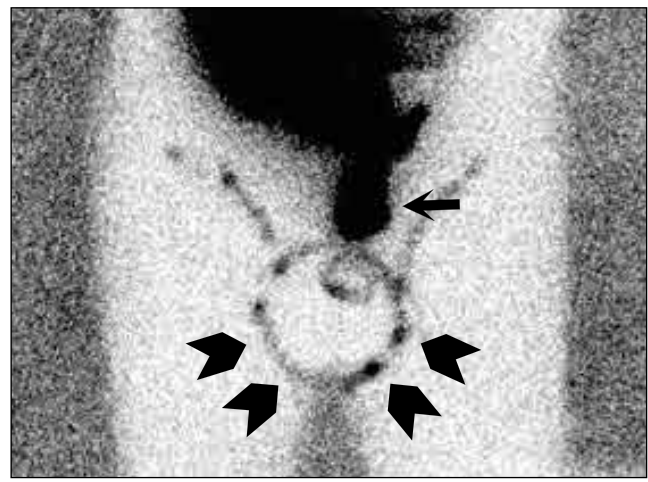
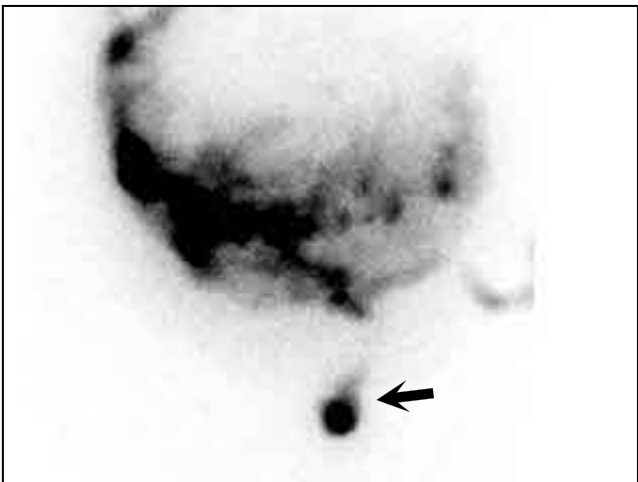
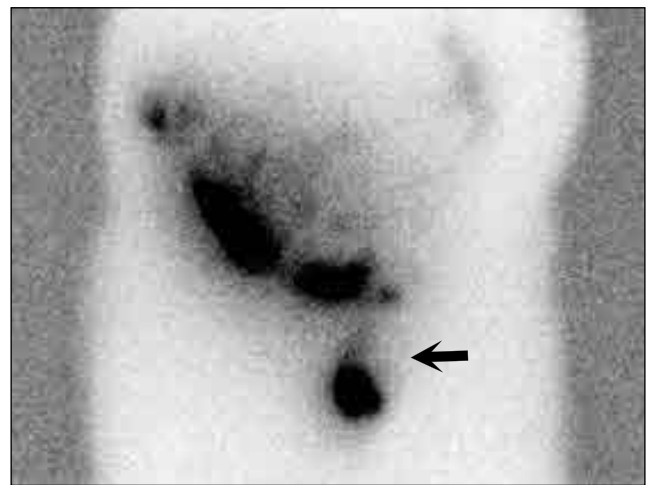
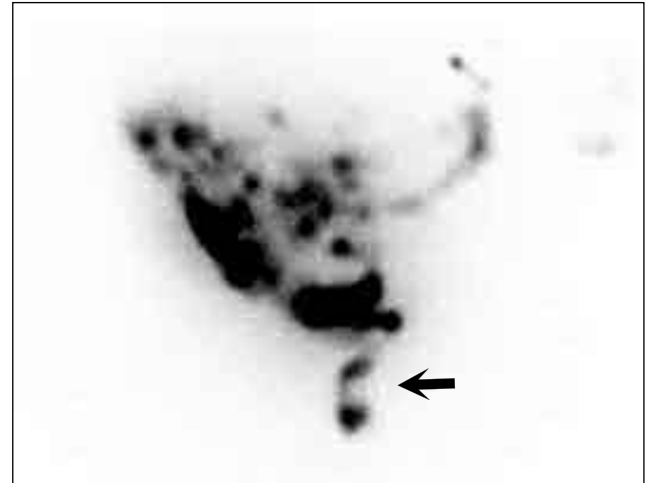
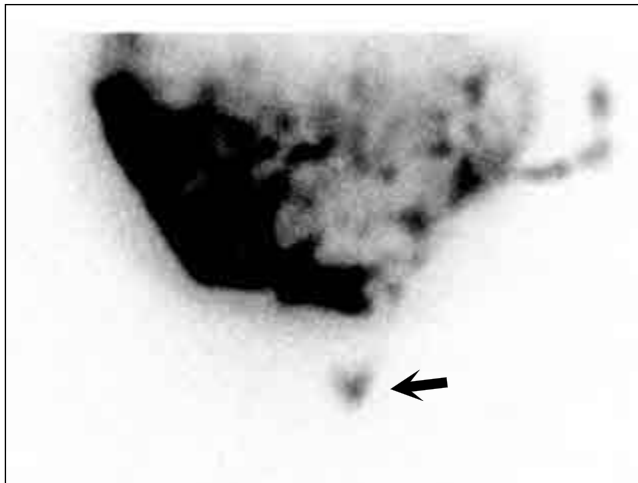


Figure 1 ^{99m}Tc-Nanocolloid peritoneal scan planar static imaging performed immediately postinjection (top), supine post ambulation image at 60-min postinjection (middle) followed by imaging in the erect posture (bottom). Activity is seen in the proximal left inguinal canal (arrow) in all the three images

Figure 2 ^{99m}Tc-Nanocolloid planar peritoneal scan images: immediate postinjection static image (top) and static images with cobalt-57 flood phantom pre-ambulation (middle) and post-ambulation (bottom). Activity is seen in the left inguinal canal (arrow). The scrotal outline is marked (chevrons)

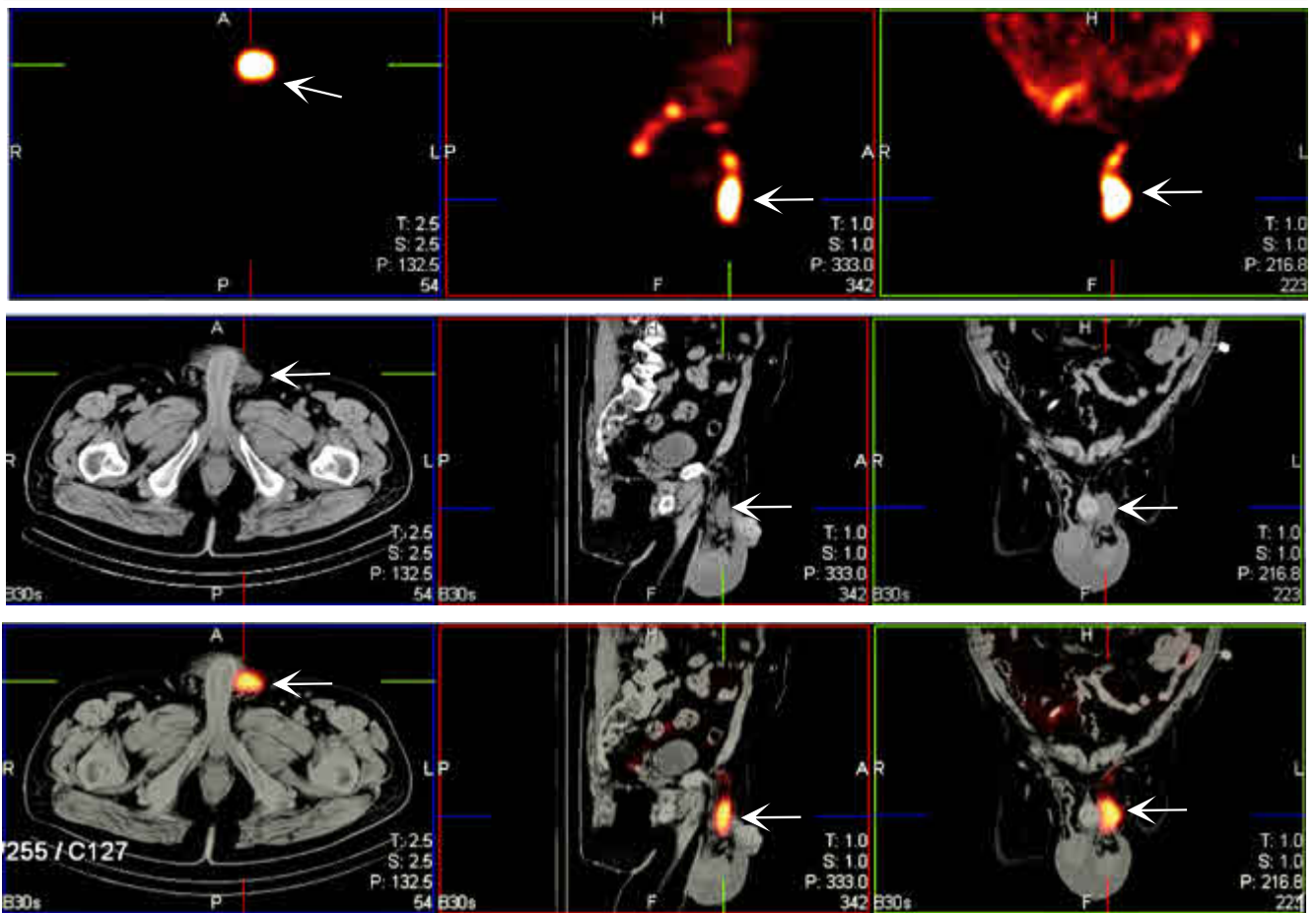


Figure 3 ^{99m}Tc-Nanocolloid SPECT-CT scan images in the transaxial (left column), sagittal (middle column) and the coronal (right column) axes with SPECT (top row), CT (middle row) and fused SPECT-CT (bottom row) showing radioactive fluid in the left inguinal canal (arrows)

Peritoneal scintigraphy was performed after intraperitoneal instillation of 120 MBq of ^{99m}Tc-Nanocolloid via the indwelling Tenckhoff catheter. Static 5-minute duration images of the abdomen and pelvis were obtained in the supine posture, immediately after tracer instillation followed by static imaging in the erect posture after ambulation. The images revealed early visualization of a focus of activity in the proximal left inguinal canal which was seen to persist unchanged on the subsequent images (Figure 1).

Case 2 A 55-year-old male recently started on CAPD due to end-stage renal disease reported with persistent bilateral scrotal swelling post CAPD. The patient had similar presentation earlier following a previous session of CAPD, which however had resolved

spontaneously. Peritoneal scintigraphy was performed after intraperitoneal instillation of 130 MBq of ^{99m}Tc-Nanocolloid via the indwelling Tenckhoff catheter. Planar sequential images of the pelvis and scrotal region were obtained with and without cobalt-57 flood phantom, pre- and post-ambulation (Figure 2). SPECT-CT was additionally performed. The images show appearance of the activity in the left inguinal region which appear to be in the left inguinal canal on CT component (Figure 3).

Discussion

A chronic elevation in intra-abdominal pressure in patients undergoing CAPD produces an increased stress on the abdominal wall which compounded by several systemic

(uraemia, anaemia, transperitoneal protein loss, etc.) and local predisposing factors (multiparity, prior abdominal surgery, patent processes vaginalis, etc.) increases the likelihood of CAPD-induced hernias [5-7].

Scrotal swelling in a CAPD patient is a cause for concern since inguinal and ventral hernias both, can cause leakage of the peritoneal fluids into the scrotum. In inguinal hernias, fluid accumulates in the cavity of tunica vaginalis through a patent processus vaginalis, whereas in ventral hernias, fluid extravasates from a peritoneal tear into the sacral tissue. Extraperitoneal leakage can also occur at the site of the catheter tip or even from torn peritoneum within a hernial sac. The etiology is further compounded by the fact that occasionally scrotal/penile oedema may result from resorption of fluid from within a patent processus vaginalis despite an intact peritoneal lining.

Since the management of these situations depends on an accurate diagnosis of the site, nature and extent of the leakage, an imaging modality, which is able to provide the relevant functional and anatomical information can alter patient management. Peritoneal scintigraphy enables tracking the radiotracer distribution and provides information on site and extent of the peritoneal leakage with the SPECT-CT fusion images help accurately localize the exact anatomical route and plane.

In conclusion, combination functional-structural imaging technique of SPECT-CT has the advantage of accurately localizing the exact site and extent of leakage as well as differentiating between the type and cause of the scrotal swelling in patients undergoing CAPD presenting with scrotal swelling. This is the first report of a SPECT-CT peritoneal scintigram in a diagnosis of peritoneal-scrotal diasylate leakage.

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