

Case Report

CT-peritoneography in diagnosis of patent processus vaginalis in peritoneal dialysis

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ABSTRACT

Patent processus vaginalis is a congenital condition characterized by persistent communication between the scrotum and peritoneal cavity which is associated with pathologies like congenital hydrocele/hernias. Asymptomatic patent processus vaginalis may become clinically evident in patients undergoing peritoneal dialysis, who may present with unilateral scrotal edema following dialysis. Conventional plain computed tomography (CT) may be difficult to identify the communication, especially if small, and in such cases, CT peritoneography will be useful to detect the patent processus vaginalis.

Keywords: Peritoneal dialysis, Computed tomography peritoneography, Patent processus vaginalis

INTRODUCTION

Diagnosis of peritoneal complications following peritoneal dialysis was done during the earlier periods around 1970s with the help of plain radiographs, contrast catheterograms, and peritoneography.^[1] However, these methods were inaccurate and misleading. Hence, they have been replaced with nuclear isotope scans (peritoneal scintigraphy), computed tomography peritoneography (CTP), and magnetic resonance peritoneography (MRP) using contrast/dye materials recently. Herein, we report a case of a 60-year-old male patient who presented with unilateral scrotal swelling following peritoneal dialysis and CTP was used to delineate the communication.

CASE REPORT

A 60-year-old male patient who was diagnosed with chronic kidney disease was undergoing regular cycles of peritoneal dialysis. He reported with complaints of the left scrotal swelling following dialysis which was increasing in size progressively. To detect any peritoneal defects, CTP was done. CTP coronal and volumetric reconstruction images demonstrated the communication between peritoneum and left hemi-scrotum [Figure 1a and b]. Surgical excision was planned and the patient was treated with lower dialysate volumes till then. Left patent processus vaginalis was confirmed intraoperatively [Figure 2], for which lichtenstein tension free hernioplasty was done.

Technique

The peritoneal cavity is completely drained of dialysate, before performing this procedure. About 50 mL of non-ionic iodinated contrast is used for each 1 l of dialysis fluid. Appropriate

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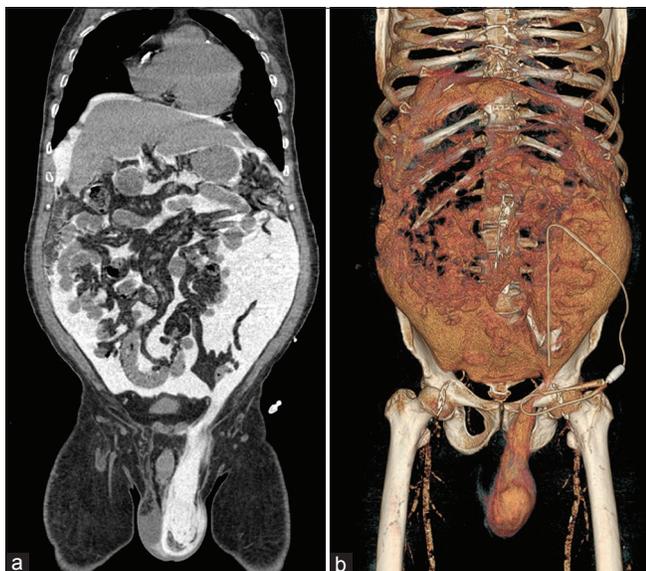


Figure 1: (a) Computed tomography peritoneography (CTP) coronal image demonstrates communication between peritoneum and left hemiscrotum. (b) CTP volumetric reconstruction image demonstrates communication between peritoneum and left hemiscrotum.

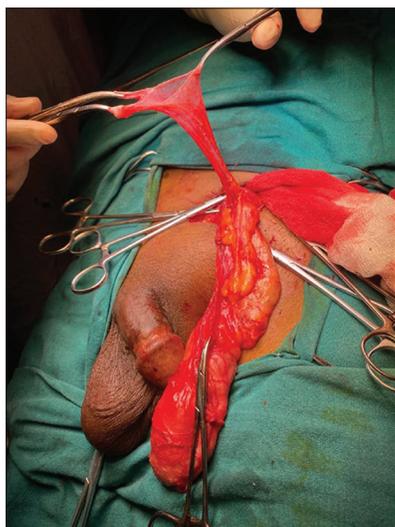


Figure 2: Intraoperative image showing left patent processus vaginalis.

volume should be administered in the above ratio and simultaneously oral or iv contrast can also be administered to diagnose any abscess or tumor, if needed. Scanning is initially performed with the patient in the supine position, 1 h post-contrast injection. Delayed scan, 4-h later, may be needed if the first scan is negative. Lateral decubitus or prone positions may be performed in selected cases. The contrast material dialysate mixture is drained at the end of the procedure.^[2,3]

DISCUSSION

Continuous ambulatory peritoneal dialysis (CAPD) is a common alternative treatment to hemodialysis for end-stage/chronic renal disease. The most common complication of CAPD is acute peritonitis.^[4] CTP has an edge advantages over plain computed tomography (CT) in detecting some of the other complications associated with CAPD. Abdominal wall and inguinal hernias are other common complications; sometimes previously asymptomatic hernias are exacerbated following CAPD.

Localized genital edema can occur in 4–10% of CAPD patients^[2] and the most common cause is inguinal hernia (10–15%).^[2] Genital swelling without a palpable hernia is often a diagnostic dilemma. This can occur as a result of dialysate leak along the fascial planes, which could mimic the inguinal hernia or due to embryological defect like patent processus vaginalis. Diagnosis of these conditions is vital to avoid unnecessary surgery.^[4]

Asymptomatic patent processus vaginalis can be seen in about 15–35% of adults.^[2] It can present as inguinoscrotal swelling following dialysis in a previously asymptomatic individual.^[4] Increase in intra-abdominal pressure following peritoneal dialysis is an important cause for leakage of dialysis fluid through acquired or congenital defect in abdominal wall or thorax. It can manifest as hydrothorax or genital/abdominal wall edema. Sometimes, the defect may be very small and may not be appreciated with routine CT. However, following increase in abdominal pressure during CTP can accurately elicit the defect.^[4]

During the earlier periods around 1970s, these complications were diagnosed using plain radiographs, contrast catheterograms, and peritoneographies. However, these methods were obsolete and have been replaced nowadays with nuclear isotope scans (peritoneal scintigraphy), CTP, and MRP using contrast/dye materials.^[1] Among these, CTP is the gold standard technique in accurate diagnosis of these conditions.^[1,4,5]

CONCLUSION

CTP has an edge over conventional plain CT in detection of small defects, adhesions, loculated fluid collections, intra-abdominal abscesses, and pseudocysts with higher sensitivity and specificity.^[5]

TEACHING POINTS

1. CT-peritoneography has high sensitivity and specificity compared to conventional CT in detection of complications associated with continuous ambulatory peritoneal dialysis.
2. Although patent processus vaginalis is rare, it should be kept in differentials for patients presenting with

unilateral scrotal swelling, following continuous ambulatory peritoneal dialysis.

COMPLICATIONS OF CAPD

1. Acute peritonitis (most common)
2. Leakage of dialysis fluid through fascial planes or peritoneal defects.
3. Adhesions
4. Drainage failure
5. Infection of exit site or tunnel
6. Intra-abdominal abscess
7. Sclerosing peritonitis
8. Catheter migration

MCQs

1. How much amount of contrast is used in the procedure of CT-Peritoneography?
 - a. 100 mL/L of dialysate
 - b. 150 mL/L of dialysate
 - c. 50 mL/L of dialysate
 - d. None of the above

Answer Key: c

2. Which of the following modalities have high sensitivity and specificity in diagnosis of patent processus vaginalis?
 - a. Non-contrast CT
 - b. CT-peritoneography
 - c. MRI
 - d. None of the above

Answer Key: b

3. Which of the following are not complications of peritoneal dialysis?
 - a. Acute peritonitis
 - b. Intra-abdominal abscess
 - c. Adhesions
 - d. Leakage of dialysis fluid
 - e. None of the above

Answer Key: e

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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