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Late peritoneal leakage due to an abdominal wall defect: report of a rare complication.

(Fuite péritonéale tardive liée à un défaut de paroi : rapport d'une complication rare)

Maria do Pilar Burillo Simões de Baião Figueiredo [1], Andreia Curto [2], Joana Marques [1,3], Vasco Fernandes [1], Ana Carina Ferreira [1,3], Fernanda Gomes [1], Teresa Marques [1], Cristina Jorge [1,3]

[1]Unidade Local de Saúde São José, Departamento de Nefrologia
[2]Unidade Local de Saúde Amadora-Sintra, Departamento de Nefrologia
[3]Nova Medical School Faculdade de Ciências Médicas da Universidade Nova de Lisboa

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Summary

Dialysate leakage is a complication of peritoneal dialysis with a 5% incidence rate. Late leaks are rare, and symptoms are subtle, as fluid loss occurs most often through abdominal wall defects.

An 83-year-old diabetic woman was started on automated peritoneal dialysis one month after catheter placement. Three years later, the patient complained of tiredness, peripheral edema, and abdominal pressure. Inspection showed local erythema and orange-peel skin. A computed tomography scan showed periumbilical drainage, suggesting a peritoneal leak. The patient was referred for surgery, which found a 5 mm aponeurotic defect; a herniorrhaphy was performed. The patient resumed her usual treatments without further complications.

Dialysate leaks may lead to discontinuation of peritoneal dialysis. The clinical presentation can be insidious, as in this case. Active surveillance was pursued, and the patient was managed without the need for temporary switching to hemodialysis.

Keywords : peritoneal dialysis, abdominal wall, surgery, computed tomography

Résumé

La fuite de liquide de dialyse est une complication de la dialyse péritonéale dont le taux d'incidence est de 5 %. Les fuites tardives sont rares et les symptômes sont discrets, car la perte de liquide se produit le plus souvent à travers des défauts de la paroi abdominale.

Nous rapportons le cas d'une femme diabétique de 83 ans qui avait débuté une dialyse péritonéale automatisée un mois après la pose du cathéter. Trois ans plus tard, la patiente s'était plainte de fatigue, d'œdème périphérique et de tension abdominale. L'inspection a montré un érythème local et une peau d'orange. Une tomodensitométrie a montré une infiltration de dialysat périombilical suggérant une fuite péritonéale. Une exploration chirurgicale a été demandée ; celle-ci a révélé un défaut aponévrotique de 5 mm et une herniorraphie a été pratiquée. La patiente a repris ses traitements habituels sans autre complication.

Les fuites de dialysat peuvent conduire à l'abandon de la technique. La présentation clinique peut être insidieuse, ce qui a été mis en évidence dans ce cas. La surveillance active a été poursuivie et la patiente a été prise en charge sans qu'il soit nécessaire de recourir à une hémodialyse temporaire.

Mots-clés : Dialyse péritonéale, paroi abdominale, chirurgie, tomographie informatisée

Corresponding Author :

Address: Rua da Beneficência 8, 1069-166 Lisboa, Portugal

Telephone number: +351 21 792 4200

Email: pilarbsimoes@gmail.com

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Introduction

Peritoneal dialysate leakage is a rare complication of peritoneal dialysis (PD). It most often occurs within 30 days after catheter insertion, and the most common presentation is pericatheter fluid leaking from or around the exit site. Late leaks are rare, and symptoms are more subtle, as fluid loss most often takes place through abdominal wall defects. Patients may complain of subcutaneous or genital edema, swelling, or slight discomfort [1]. Imaging techniques such as computed tomography are used to confirm the diagnosis and guide surgical management [2].

Case Report

An 83-year-old woman with end-stage kidney disease (ESKD) due to presumed diabetic nephropathy started automated peritoneal dialysis (APD) in 2021, one month after percutaneous placement of a silicon double-cuff PD catheter on the left paramedian abdominal wall.

The patient had a previous history of type 2 diabetes mellitus with microvascular (retinopathy and nephropathy) and macrovascular (peripheral artery disease and ischaemic heart disease) complications and hypothyroidism. She had had two healthy, full-term pregnancies. There was no history of abdominal wall defects, abdominal wall surgery (besides catheter placement), or other risk factors such as previous courses of steroid therapy.

The initial follow-up after starting PD was uneventful. After 3 years, Kt/V for urea was 2.2, creatinine clearance was 63L/week, residual urinary output was 1L/day, and there was no ultrafiltration (UF) failure. However, the patient presented to a regular follow-up consultation complaining of tiredness, anorexia, and peripheral edema. Due to the risk of further loss of residual renal function, the dialysis dose was incremented by adding one extra manual dwell with icodextrin to increase peritoneal UF.

After one week, she came to our emergency department complaining of a sensation of pressure below her umbilicus. Inspection showed local erythema and an orange-peel appearance of the skin that did not follow the path of the subcutaneous tunnel but rather extended throughout the infraumbilical region *(Figure 1)*. The exit site showed no signs of inflammation, and peritoneal effluent was clear. The patient's vital signs were normal.

Figure 1. Orange-peel appearance of the skin in the abdominal region

To assess for a possible pericatheter leak and rule out a catheter fracture, a computed tomography (CT) scan was performed with contrast infusion into the peritoneal cavity *(Figures 2 and 3)*. The protocol included a standard non-contrast CT scan followed by a 2 h dwell of 1.36% glucose dialysate to which 100 ml of contrast was added, comprising a total of 2 liters of infused fluid.

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Figure 2. Transversal CT cut showing catheter placement across the abdominal wall into the peritoneal cavity (green arrow)

Figure 3. Transversal CT showing contrast leakage through the linFigure 3. Transversal computed tomography (CT) showing contrast leakage through the linea alba (green arrow)

A second CT scan was performed afterward. Imaging showed dialysate drainage through the midline in the periumbilical region, where there was also significant adipose tissue densification. Intraperitoneal pressure was not measured at this time.

A small break in the catheter tubing resulting in drainage through the closest weak point on the abdominal wall (in this case, the linea alba) was considered to be the most probable cause, and the patient was referred for elective corrective surgery.

After the CT scan, the peritoneal fluid was completely drained with no complications. The dialysis protocol was changed, including withdrawal of the manual day dwell, to reduce intraperitoneal pressure. The patient was started on antimicrobial therapy with ciprofloxacin 250 mg every 12 hours and prophylactic oral nystatin for the following days while awaiting surgery. Because there was no loss of ultrafiltration, the new protocol was kept throughout this period, and careful monitoring was performed.

Surgery was performed 2 weeks later through an infraumbilical incision; a small 5 mm aponeurotic defect concerning the umbilicus was found. A herniorrhaphy was then performed with

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the PD catheter remaining untouched. The patient resumed her usual treatments without further complications.

Discussion

Late peritoneal dialysate leakage is defined in the literature as taking place at least 30 days after catheter placement. Research data is scarce. The largest retrospective cohort study to date reports the same 5% incidence rate for both early (within 30 days) and late leaks (which occur throughout the following 10 years). Only 3.6% present after 3 years, which illustrates their rarity [3]. Common risk factors include abdominal surgery, previous pregnancy, and treatment with corticosteroids [1]. A smaller study reported a greater incidence of late leaks in female patients with left-sided catheters—such as our patient—treated with continuous ambulatory PD [4]. It is reasonable to question if the extra dwell that was added to the protocol the week before might have contributed to increased intraabdominal pressure, herniation, and subsequent leak development.

Data on the incidence of different types of leaks (peritoneal, pericatheter, and subcutaneous) is also lacking. One Canadian study reports two of eight late leak cases as being related to abdominal wall herniation [5], whereas the most recent late leak report links it to accidental needling of the catheter, stressing how infrequent late leaks are regardless of their causes [6].

As previously mentioned, symptoms are also more elusive. Actual leaking is present in less than 25% of cases. Poor dialysate outflow is the most common manifestation [3], but our patient did not present this sign. Moreover, orange-peel skin is even less frequent, and few reports list it as a possible sign to consider [7, 8] despite it being the most prominent finding on physical examination in this particular case.

Conclusion

Dialysate leaks are mechanical complications of PD, with an estimated incidence of 5%. The clinical presentation can be subtle, which was highlighted in this case. Dialysate leaks may lead to the discontinuation of PD. In this case, active surveillance was pursued, and the patient managed with abdominal wall repair without the need for temporary switching to hemodialysis. This strategy has several advantages for the patient, as it maintains quality of life and reduces the morbidity risk associated with invasive procedures while also optimizing institutional resources.

Authors' Contributions

The authors Pilar Burillo Simões and Andreia Curto were involved in writing most of this manuscript, while Joana Marques, Vasco Fernandes, Fernanda Gomes, Teresa Marques, Cristina Jorge, and Ana Carina Ferreira provided invaluable clinical insight and reviewed and approved the final submitted version.

ORCISid

Maria do Pilar Burillo Simões de Baião Figueiredo: https://orcid.org/0000-0002-6651-1378
Andreia Curto: https://orcid.org/0000-0001-5830-6086
Joana Marques: https://orcid.org/0000-0002-7216-8086
Vasco Fernandes: https://orcid.org/0000-0003-1798-4387
Ana Carina Ferreira: https://orcid.org/0000-0002-1323-5293
Fernanda Gomes: https://orcid.org/0009-0008-5406-8015
Teresa Marques: https://orcid.org/0009-0000-3726-9351
Cristina Jorge: https://orcid.org/0000-0001-7850-4805

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Patient Consent

The patient kindly gave her consent to publish the case.

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Conflicts of Interest

We know of no conflicts of interest associated with this publication. We also confirm that the manuscript has been read and approved for submission by all the named authors.

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