

## Case Report

# Peritoneal pseudocyst: a rare complication of peritoneal dialysis

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## ABSTRACT

Peritoneal dialysis is a method of renal function replacement which has a series of advantages like greater autonomy of the patient, but it also has disadvantages, like leakage, peritonitis and abdominal wall weakness. We present the case of a patient with a history of renal replacement therapy managed on peritoneal dialysis which presents a rare complication that required surgical treatment. A peritoneal pseudocyst enclosing the dialysis catheter tip is a rare complication of peritoneal dialysis. The pathogenesis of pseudocyst formation is not yet explained; however, bacterial infections and abdominal surgery seem to be predisposing factors. It is important to know how peritoneal dialysis works and the early and late complications of this renal function replacement therapy. Further studies are needed in this area to look into the pathophysiology and evaluate the contributing factors for the development of peritoneal pseudocyst and its treatment.

**Keywords:** Peritoneal dialysis, Pseudocyst, Peritoneum, Renal dialysis, Complications

## INTRODUCTION

Chronic renal disease represents a serious public health problem, currently it is estimated that in 10% of the world problem presents such disease, of which between 1.4 to 2.4 million receive treatment replacement of renal function. In 2017, a prevalence of 12.2% and 51.4 deaths per 100,000 inhabitants were reported in Mexico.<sup>1</sup> Diabetes mellitus is the main cause of renal failure accounting for about 45% of all new cases and is the principal cause of death in young diabetic patients.<sup>2</sup>

Peritoneal dialysis is method of renal function replacement used in end stage renal disease along with hemodialysis and renal transplantation.<sup>3</sup> Peritoneal dialysis is considered superior alternative to hemodialysis, due to its ambulatory modality, patient comfort and cost effectiveness.<sup>4</sup> Main disadvantages of peritoneal dialysis are the risk of infections and a limited life-time due to peritoneal membrane failure.<sup>5</sup> Some of these complications require surgical treatment and may

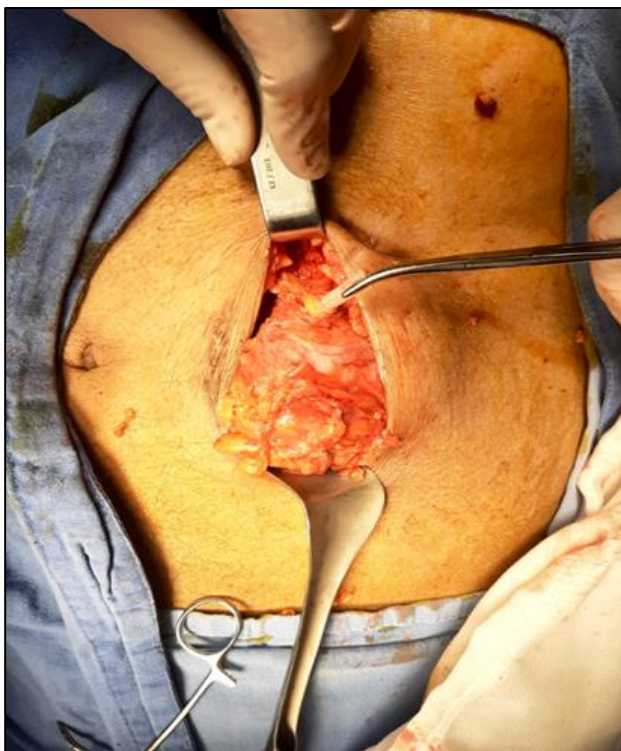
be classified as infectious and non-infectious. Infectious complications are peritonitis, exit-site and tunnel infections. Non-infectious complications are mechanical like catheter obstruction/malfunction, external leakage, abdominal wall defects, scrotal swelling, pleuro-peritoneal fistula, ultrafiltration failure and encapsulated peritoneal sclerosis.<sup>6</sup> As well, we can classify complications at different times following placement of peritoneal dialysis catheter, that are shown in Table 1.<sup>7</sup> However, only a few cases of abdominal and peritoneal pseudocyst formation as a complication of this form of dialysis are reported.<sup>8</sup> Complications that require surgical intervention are not well documented in literature.<sup>9</sup>

We present the case of a male patient with a 3-year history of peritoneal dialysis, who developed a peritoneal pseudocyst that required surgical management.

## CASE REPORT

A 66-year-old man with past medical history of hypertension, diabetes mellitus and end-stage renal

disease, actually on treatment with hemodialysis. He started continuous ambulatory peritoneal dialysis in 2020. In the course of his treatment, he experienced 3 episodes of peritonitis treated with antibiotics. In March 2023, he presented inflow problems, lack of appetite and pain in site of catheter. As well, he refers to having an increase in volume at the exit site of the catheter, without being able to make replacements at home, reason peritoneal dialysis was discontinued, and hemodialysis catheter was placed. He presented pain in left hemiabdomen, associated with chills and attends to emergency room. Physical examination reveals a protrusion through abdominal wall, specifically in catheter exit site, hyperemia and tenderness. Patient did not have fever but presented leukocytosis and increased serum lactate levels (2.9 mmol/l), so it is decided to realize and emergent surgery on suspicion of incarcerated incisional hernia, finding peritoneal pseudocyst attached to aponeurosis of approximately 7×6 cm, through which dysfunctional dialysis catheter passed (Figure 1). The cyst is dissected in its entirety and primary closure of aponeurosis is performed with continuous upwelling with absorbable suture. Blake drainage is placed in subcutaneous cell tissue and skin is faced with simple points with nylon. Under a week, go to review consultation and decide the removal of the drain. Histopathology reports surgical specimen of 6.7×6×5 cm closed compatible with dialytic pseudocyst (Figure 2), with abundant fibroadipose tissue, recent and old hemorrhagic material content. Patient continued with hemodialysis as method of renal function replacement.



**Figure 1: Pseudocyst attached to aponeurosis with presence of peritoneal dialysis catheter.**



**Figure 2: Surgical specimen compatible with closed peritoneal pseudocyst and peritoneal dialysis catheter.**

**Table 1: The most common early and late surgical complications associated with peritoneal dialysis.**

Early	Late
<b>Surgical wound hemorrhage or catheter exit-site hemorrhage</b>	Problems with the outflow of the dialysate
<b>Bloody fluid from the catheter</b>	Hernias
<b>Intestinal perforation, urinary bladder perforation</b>	Leakage of dialysate to scrotum
<b>Dialysate leakage through the wound or exit site of the catheter</b>	Exit-site infections
	Peritonitis
	Encapsulating peritoneal sclerosis

## DISCUSSION

The most common complications of peritoneal dialysis include peritonitis, exit site infection, tunnel infection, and noninfectious complications, such as pain, dialysate leakage, hydrothorax, pericardial effusion, hemoperitoneum, hernias, and mechanical obstruction of peritoneal catheters.<sup>5</sup> There are very few reported cases of peritoneal pseudocysts as a complication of peritoneal dialysis.<sup>8</sup> Precise pathophysiology of pseudocyst formation and standardized management guidelines of peritoneal pseudocyst are currently scarce due to the limited number of known cases.<sup>5</sup> In patients with peritoneal dialysis, whether the pseudocyst occurs secondary to chronic irritation of the peritoneum or as result of recurrent bacterial infection is unknown, however, bacterial infections and abdominal surgery seem to be predisposing factors.<sup>4</sup> Formation of a pseudocyst around the tip of an intraperitoneal catheter has been described previously as a rare complication of ventriculoperitoneal shunts in the treatment of

hydrocephalus.<sup>9</sup> This occurs mainly in children and may lead to shunt malfunction because of distal catheter obstruction by the abdominal pseudocyst.<sup>10</sup> A pseudocyst can be diagnosed either by ultrasonography, or more precisely with computed tomography.<sup>6</sup> In this case, the patient presented signs of incarcerated hernia, so it was decided to practice an emergent surgery. Surgical removal of a symptomatic peritoneal pseudocyst is considered curative.<sup>11</sup>

## CONCLUSION

Peritoneal dialysis continues to be a useful and first line therapy for renal function replacement therapy in patients with advanced chronic renal disease. However, serious and recurrent complications can occur that are often challenging to diagnose and treat, as shown in our case by a peritoneal pseudocyst which is unknown the cause and the development mechanism. More studies are needed to evaluate comprehensive management and developmental factors to integrate a standardized treatment. It is important to know how peritoneal dialysis works and also the early and late complications of this therapy.

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