

Case Report

Peritoneal Dialysis Catheter Inducing Colon Perforation

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ABSTRACT

Introduction: Peritoneal dialysis for end stage renal disease is not the treatment of choice in the pediatric population. It has many complications related to the procedure itself or to the inserted catheter. One of its rarest complications is perforation of the colon by the peritoneal dialysis catheter.

Case Presentation: A 6 years old boy on peritoneal dialysis for the treatment of patients' medical conditions, peritoneal presented for a peritoneal dialysis catheter emerging out of his dialysis requires regular follow up from the patient in order to anus without any signs of peritonitis and bowel perforation. avoid possible dangerous complications.

Discussion: Besides obstruction, leakage and displacement, peritoneal dialysis catheter predisposes the patient to the risk of bowel perforation. Although extremely rare, it must be considered during imaging especially when the patient is not compliant to medical instructions. Less than 40 cases have been reported worldwide and all of which belong to the adult population.

Conclusion: Like all other medical and surgical procedures Pediatrics requires regular follow up from the patient in order to avoid possible dangerous complications.

Keywords: Peritoneal dialysis, Catheter, Colon perforation, Pediatrics

Introduction

About a half of the pediatric chronic kidney disease patients are due to congenital anomalies of the kidneys and urinary tract including aplasia/hypoplasia/dysplasia and obstructive uropathy respectively. This what distinguish the pediatric population from the adult population whose CKD is usually due to diabetic, hypertensive nephropathy or autosomal dominant polycystic kidney disease. Although kidney transplant is the treatment of choice for patients suffering from end stage renal disease, dialysis options including hemodialysis and peritoneal dialysis are considered in certain circumstances as a transitory period before considering transplantation [1]. Regarding peritoneal dialysis, several complications are associated with the peritoneal dialysis (PD) catheter itself including obstruction, leakage, displacement and hernias [2]. Here we present an extremely rare case of PD catheter perforating the colon and emerging from the anus.

Case Presentation

History and Presentation

A 6-year-old boy treated with peritoneal dialysis for end-stage renal disease presented to the emergency department (ED) of Rafik Hariri University Hospital complaining of a peritoneal dialysis catheter protruding out of his anus (**FIGURE 1**). History goes back to 5 years prior to presentation when the child was diagnosed with end stage renal disease (ESRD) due to delayed diagnosis of obstructive uropathy. One year after diagnosis, he was started on peritoneal dialysis. His PD catheter was replaced one year earlier to presentation to the ED and the PD catheter was off service for the past 5 months. An important point to be mentioned is that the family are not compliant to the treatment and they have lost follow up with the pediatric nephrologist in the past 6 months during which the nephrologist was continuously insisting on the removal of the catheter without any response from the family due to financial issues to which they excuse themselves.

Upon presentation, the boy was calm and was not complaining of any associated signs or symptoms. He had no abdominal pain, no vomiting and no signs of intestinal obstruction. His vital signs showed an afebrile child, with no tachycardia or tachypnea and a normal blood pressure for his age. Palpation of the abdomen showed a soft, moderately distended abdomen without signs of rigidity nor peritonitis. He also had generalized edema most probably due to his unfollowed ESRD.

Diagnostic Focus and Assessment

No computed tomography (CT) scan of the abdomen was performed. Diagnosis was established based on clinical presentation and physical assessment. He was planned for urgent exploratory laparotomy for the removal of the PD catheter that eroded through the colonic wall and emerged out of the anus. Blood samples were drawn out for hematologic and biochemistry testing prior to surgical intervention. Results are presented in **TABLES 1 & 2**.

Figure 1: Peritoneal dialysis catheter emerging from the anus of the 6 years old boy.

Table 1: Hematology laboratory test results.	
Haemoglobin (g/L)	7.5
White blood cells (cu/mm^3)	18800
Haematocrit (%)	23.5
Mean cell volume (fL)	82.8
Platelets (cu/mm^3)	416000
Neutrophil (%)	57.3
Lymphocyte (%)	24.3
Monocyte (%)	6.6
Eosinophil (%)	10.8
Basophil (%)	0.9
INR	1.03

Table 2: Biochemistry, laboratory test results.	
Sodium (mEq/L)	133
Potassium (mEq/L)	4.83
Chloride (mEq/L)	103.6
CO_2 (mEq/L)	4.9
Creatinine (µmol/L)	4.1
BUN (mg/dL)	107
CRP (mg/dL)	2.2

Therapeutic Focus and Assessment

Laparotomy was performed under general anesthesia for the removal of the PD catheter and closure of the underlying fistula. The operative report mentioned the following: after a midline abdominal incision below the umbilicus was done, sigmoid colon was dissected showing a fistula through which the PD catheter emerged. The catheter was removed and the colon sutured followed by the closure of the abdominal layers and closure of the wound with subcuticular layer sutures. Patient was then monitored during the post-operative period in the hospital for 7 days during which he received metronidazole and ceftriaxone. His urine output was monitored and found to be 2 ml/kg/hour. Oral intake was enhanced progressively and tolerated with normal regular bowel movements. He was then discharged home and followed up regularly with his nephrologist after financial coverage for full treatment was available through a non-governmental organization.

Discussion

Peritoneal dialysis is the dialysis treatment of choice for children with ESRD. There are two techniques for peritoneal dialysis.

The first modality is automated peritoneal dialysis were the patient is connected to a machine during the night and this will preserve the day hours for regular activities. The second modality is continuous ambulatory dialysis which allows for greater time for the dialysate fluid to remain in the abdomen [3].

It has several advantages over hemodialysis including better quality of life so that the patient can attend his life activities including school and less need for vascular access and this will lead to less infections. Also, this modality will result in the preservation of kidney function for a longer time more than hemodialysis [4]. To be added that peritoneal dialysis is preferred due to the large surface area of the peritoneum in children which is greater than adult which results in greater efficacy in clearing fluids. Also, the slow process of dialysis with the large pores within the peritoneal membrane make it a more physiologic-like process (less inflammation induction) and helps eliminating large molecules that cannot be eliminated by hemodialysis [5].

Despite its advantages, several complications are associated with the peritoneal dialysis technique. Those can be summarized in 4 main points: obstruction, leakage, infection and intra-abdominal injuries. In the pediatric population, coiled double-cuffed catheters are the preferred modality for peritoneal dialysis which is associated with higher risk for catheter tip migration and access revision for possible catheter replacement [4,3].

The above patient presents with an extremely rare complication of peritoneal dialysis catheter. It is the only reported pediatric case, to our knowledge, presenting with a perforated colon by a PD catheter.

Conclusion

PD catheter complications are diverse. Family and patient should be educated on the proper care of the PD catheter and septic conditions during the procedure. This prevents the occurrence of the avoidable complications such as infection and peritonitis. Also, regular follow up and clinging to nephrologist recommendations is very important. Finally, any abdominal complaint must be taken seriously especially that an intra-abdominal device always poses a risk for bowel perforation.

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