Open Access Library Journal
2022, Volume 9, e8705
ISSN Online: 2333-9721
ISSN Print: 2333-9705

Conservative Treatment of Bladder Perforation by Peritoneal Dialysis Catheter: A Case Report

Mahamoud Mohamed Houssein[1], Theresia Mponguili-Peya[1], Abdelaali Bahadi[1,2], Driss El Kabbaj[1,2]

[1]Department of Nephrology, Dialysis and Renal Transplantation Mohammed V Military Training Hospital, Rabat, Morocco
[2]Faculty of Medicine and Pharmacy, Mohammed V University, Rabat, Morocco
Email: marouainemoud91@gmail.com

How to cite this paper: Houssein, M.M., Mponguili-Peya, T., Bahadi, A. and El Kabbaj, D. (2022) Conservative Treatment of Bladder Perforation by Peritoneal Dialysis Catheter: A Case Report. *Open Access Library Journal*, **9**: e8705.
https://doi.org/10.4236/oalib.1108705

Received: April 11, 2022
Accepted: June 14, 2022
Published: June 17, 2022

Abstract

Insertion of peritoneal dialysis (PD) catheter into the bladder is a rare complication of PD. Herein, we describe a case of an adult patient, diabetic for a long time undergoing PD tube insertion who was found to have a catheter in the urinary bladder. He was treated after waiting for the bladder breach with indwelling bladder catheterization with repositioning of the same catheter, and prophylactic antibiotics. The evolution is marked by the regression of the symptomatology and the survival of the technique. This report gives a timely reminder of the need to check for urinary bladder distension prior to PD catheter insertion surgery. Perforating injuries should be considered in patients with symptoms related to the urinary tract and free flow of fluid from the PD tube.

Subject Areas

Nephrology

Keywords

Peritoneal Dialysis, Bladder Perforation, Conservative Treatment

1. Introduction

Peritoneal dialysis (PD) is a method of extra-renal purification whose principle is to ensure exchanges between the dialysate and the blood through the peritoneal membrane according to diffusive and convective phenomena. This dialysate is introduced into the abdominal cavity through a flexible catheter with multiple holes at one end, called a TENCKHOFF type PD catheter. The peritoneal dialysis catheter (PD) is inserted through three approaches (laparoscopy, mini-laparotomy

and percutaneous). It is a procedure that is not without risk. The data in the literature suggest a frequency of complications ranging from 1% to 28% of cases depending on the implantation technique used and the type of complication that occurs [1].

Among these complications, we can note complications of an infectious nature, dominated immediately after insertion by infection of the catheter orifice and at a distance by peritonitis. Non-infectious complications: catheter migration, organ perforation. Bladder perforation by the catheter is rarely described among the surgical complications of PD. One of the methods of preventing the occurrence of this rare complication is bladder catheterisation during catheter placement [2].

This article highlights the importance of bladder catheterisation prior to PD catheterisation in a patient with a diabetic background. We report the case of an adult patient with long-standing diabetes who developed haematuria after PD catheter placement.

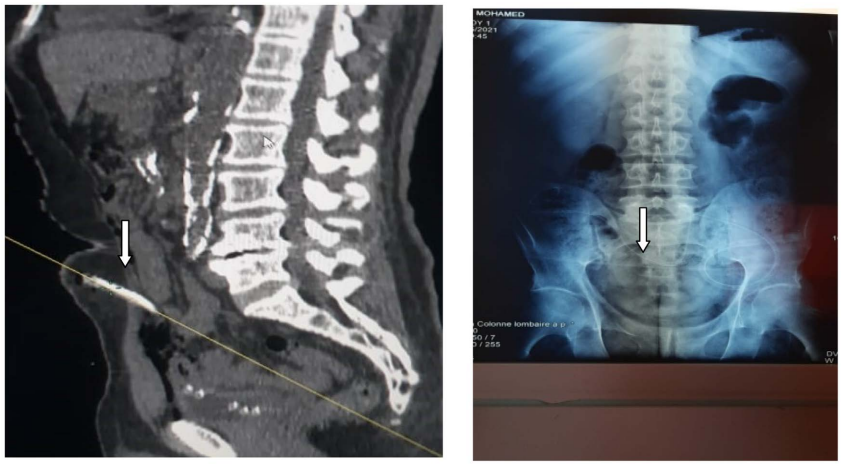
The aim of this work is to present the therapeutic modalities of a bladder breach following PD catheter placement and also to evaluate the survival outcome of the technique.

2. Observation

This is a 71-year-old patient followed for type 2 diabete for 23 years, complicated by ischemic heart disease and peripheral neuropathy. He was admitted for management of end-stage renal failure with preserved diuresis. The three methods of replacement were explained to the patient who chose peritoneal dialysis to preserve his autonomy and given his distance from a haemodialysis centre (35 km from the nearest centre and home haemodialysis not available).

The TENCKHOFF double sleeve peritoneal dialysis catheter was inserted under local anaesthesia by percutaneous route under the umbilical according to the **modified Seldinger technique**. This technique, which is not widely used at present, was recently described in detail by Karlien François [3]. The radiological control by abdomen without preparation after the procedure showed a badly positioned catheter above the **pouch of Douglas**. The following day the patient presented with haematuria and dysuria, which led to an ultrasound scan and then an abdominal-pelvic CT scan without injection of contrast. The latter showed the presence of an intravesical catheter with perivesical aerial effusion (**Figure 1**) the catheter in intravesical position.

With the urological surgeons, conservative treatment was recommended. Management consisted of removal of the catheter from the bladder and its replacement intraperitoneally, with antibiotic coverage, and placement of a bladder catheter during the replacement and for the following week. The standard radiological check (**Figure 2**) shows a well positioned and functional catheter with no symptoms after catheter repositioning and during the week of bladder catheterisation. At the end of the 7th day, the bladder catheter was removed and the test with 500 ml of saline solution showed a functional catheter.



(a) (b)

Figure 1. Peritoneal dialysis catheter control after placement. (a): Unprepared abdomen showing the catheter in an elevated pelvic position. (b): Abdominal-pelvic CT scan without iodinated contrast injection showing the intravesical catheter.

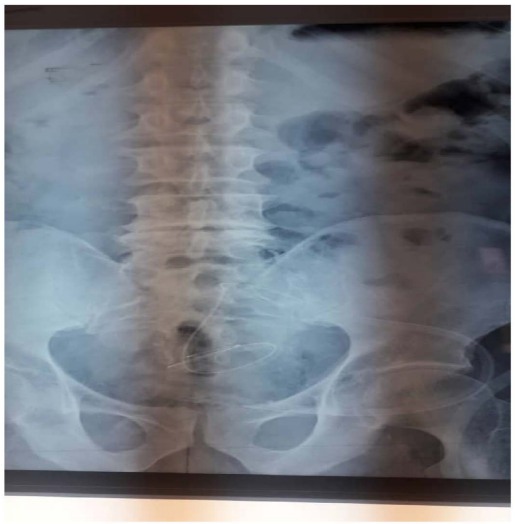


Figure 2. Abdomen without control preparation after catheter replacement.

3. Discussion

Peritoneal dialysis is as effective as haemodialysis as part of sequential and integrated therapy for end-stage renal disease. The effectiveness of peritoneal dialysis as a replacement modality relies on a functional and durable peritoneal approach [4] [5].

It can be implanted in three different ways: laparoscopically, offering the possibility to perform adhesiolysis in the presence of flanges with fewer mechanical complications, laparotomically or percutaneously. If well controlled, no superiority has been noted for one technique over the other in terms of survival and or effectiveness of the technique [6].

The catheter can be used on average five to ten days after placement or sooner, depending on the urgency of starting dialysis.

The PD catheter can also be inserted under local anaesthesia using a blind percutaneous approach (Seldinger technique) or under ultrasound or radioscope guidance [5]. In our patient, the catheter was inserted using the modified Seldinger method.

The latter, described extensively by Karlien François [3], is performed under local anaesthesia; a saline pre-fill is instilled through a needle inserted through a subumbilical incision. A guide wire is inserted through the needle and into the peritoneal cavity and directed into the pelvis. The needle is withdrawn and a dilator with a peelable sheath is threaded over the guide wire through the fascia.

The guidewire and dilator are removed from the sheath. Eventually, to facilitate insertion, the catheter is straightened and stiffened by insertion of a stylet. If a long guide wire is used, it may be left in the peelable sheath and the catheter is threaded through it.

The dialysis catheter is directed through the sheath into the pelvis. As the deep sleeve of the catheter is advanced, the sheath is detached. The deep sleeve is advanced to contact the fascia [5].

This technique has been the first choice in our training for the last two years, as it allows a reduction in the waiting time for patients before catheter insertion and given the constraints of access to operating theatres linked to the COVID pandemic19.

The complications of this technique are dominated by infectious complications such as infection of the exit orifice, peritonitis at a distance from the insertion [7], and mechanical complications most often linked to the insertion of the technique and which may compromise it [1] [8].

Perforation of an internal organ occurs when entering the abdominal cavity or when advancing the catheter with the stylet into the abdomen.

The intestine is the most common internal organ susceptible to perforation. It occurs in 1% of procedures [9]. It presents within the first 48 hours after surgery with signs of peritonitis and requires urgent surgical intervention.

Bladder trauma by perforation remains rare in PD [1]. Sixteen cases have been reported in the literature [2]. For our patient, diabetes with all its degenerative micro and macro-angiopathic complications are explanations for a weakened bladder wall susceptible to perforation. This risk is increased on a full bladder when the catheter is placed.

Several favourable causes have been evoked, namely neurogenic bladder, chronic bladder distension in low situated obstacles. The delay in symptomatology is often late and manifests as bladder irritation when exchanges are initiated [10]. In our case, the presence of the catheter in the bladder, as seen on abdominal CT without injection of contrast medium, was considered to be a bladder perforation, following the example of M. Elgaali *et al.* [2].

Other causes of atonic bladder have been described including stroke and spinal trauma.

In case of bladder perforation, the therapeutic attitude varies according to the associated lesions. Conservative treatment by placing a bladder catheter is pro-

posed if there is no other lesion requiring surgery. In the opposite case, bladder suture remains the rule, which can be performed by laparoscopy or open surgery [11] [12]. For our patient, we opted for conservative treatment given the absence of other organ lesions.

To prevent this trauma, it is advisable to ensure that the bladder is emptied, or to insert a bladder catheter in case of doubt or in certain cases, particularly in diabetics or elderly patients. It is also preferable to check the position of the needle before placing the guide by infusing a litre of physiological serum to ensure that it is intraperitoneal.

This case study reminds us of the importance of the interrogation in diabetic patients (*i.e.* the presence of urinary signs such as urgency, dysuria and pollakiuria). We underline the interest of conservative treatment under local anaesthesia of the bladder breach with replacement of the catheter under indwelling bladder catheter for one week without the need for surgical revision.

4. Conclusion

Bladder perforation by the PD catheter is rarely described in the literature. Bladder catheterisation prior to catheter insertion remains a means of prevention to minimise the occurrence in patients at risk. Conservative treatment may be recommended for patients without other organ damage.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Zakou, A.R.H., *et al.* (2020) Implantation du catheter de dialyse peritoneale: Technique et complications. *PAMJ Clinical Medicine*, **2**, 19. https://doi.org/10.11604/pamj-cm.2020.2.19.20916

[2] Elgaali, M., *et al.* (2017) Urine Producing Peritoneal Dialysis Catheter. *BMJ Case Reports*, vol. 10, Article ID: 219844. http://dx.doi.org/10.1136/bcr-2017-219844

[3] Francois, K., De Clerck, D., Robberechts, T., Van Hulle, F., Van Cauwelaert, S., Luyten, I. and Jacobs-Tulleneers-Thevissen, D. (2021) Percutaneous insertion of peritoneal dialysis catheters by the nephrologist (modified Seldinger technique). *Bulletin de la Dialyse à Domicile*, **4**, 277-288. https://doi.org/10.25796/bdd.v4i4.63393

[4] Ryckelynck, J.-P., Lobbedez, T. and de Ligny, T.B. (2005) Peritoneal Dialysis. *Nephrology & Thérapeutique*, **1**, 252-263. https://doi.org/10.1016/j.nephro.2005.06.009

[5] Crabtree, J.H., *et al.* (2019) Creating and Maintaining Optimal Peritoneal Dialysis Access in the Adult Patient: 2019 Update. *Peritoneal Dialysis International*, **39**, 414-436. https://doi.org/10.3747/pdi.2018.00232

[6] Veys, N., Biesen, W.V., Vanholder, R. and Lameire, N. (2002) Peritoneal Dialysis Catheters: The Beauty of Simplicity or the Glamour of Technicality? Percutaneous vs Surgical Placement. *Nephrology Dialysis Transplantation*, **17**, 210-212. https://doi.org/10.1093/ndt/17.2.210

[7] Li, P.K.-T., Szeto, C.C., Piraino, B., *et al.* (2016) ISPD (International Society of Peritoneal Dialysis) Peritonitis Recommendations: 2016 Update on Prevention and Treatment. *Peritoneal Dialysis International*, **36**, 481-508. https://doi.org/10.3747/pdi.2016.00078

[8] Fattoum, S., *et al.* (2020) Les complications mécaniques en dialyse péritonéale: Une menace à la technique? *Néphrologie & Thérapeutique*, **16**, 285. https://doi.org/10.1016/j.nephro.2020.07.088

[9] Crabtree, J.H. and Fishman, A.A. (2000) Laparoscopic Approach under Local Anaesthesia for Peritoneal Dialysis Access. *Peritoneal Dialysis International*, **20**, 757-765. https://doi.org/10.1177/089686080002000629

[10] Moreiras, M., Cuiña, L., Rguez, G.G., *et al.* (1997) Inadvertent Placement of a Tenckhoff Catheter into the Urinary Bladder. *Nephrology Dialysis Transplantation*, **12**, 818-820. https://doi.org/10.1093/ndt/12.4.818

[11] Oitchayomi, A. and Doerfler, A. (2016) Prise en charge des traumatismes de la vessie. Elsevier Masson.

[12] Mahat, Y., *et al.* (2019) A Contemporary Review of Adult Bladder Trauma. *Journal of Injury and Violence Research*, **11**, 101-106. https://doi.org/10.5249/jivr.v11i2.1069