www.bdd.rdplf.org Volume 6, n° 1, April 2023
https://doi.org/10.25796/bdd.v6i1.76683
ISSN 2607-9917

Bulletin de la Dialyse à Domicile

The essentials for stress-free management of patients with polycystic kidney disease on peritoneal dialysis). Clinical case report and review

(L'essentiel pour une gestion sans stress des patients porteurs d'une polykystose hépato-rénale en dialyse péritonéale. Cas clinique et revue)

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To cite : Toure F. Review flash: the essentials for stress-free management of patients with polycystic kidney disease on peritoneal dialysis. . Bull Dial Domic [Internet] 6(1). Available from: https://doi.org/10.25796/bdd.v6i1.76683

Note : ce texte est disponible en Français à la même adresse url : https://doi.org/10.25796/bdd.v6i1.76683

Summary

Autosomal dominant polycystic hepatorenal disease is a common chronic kidney disease. Among the proposed replacement therapies, peritoneal dialysis (PD) concerns less than 7% of polycystic patients. The underutilization of PD is due to the fear of potential technical failure due to its potential impact on the large intraperitoneal organs.

To illustrate the feasibility of the use of PD with polycystic patients despite the risk of organomegaly, we report the case of a 70-year-old patient with polycystic hepatorenal disease who has been treated with peritoneal dialysis after a long history of renal transplantation and hemodialysis. The patients'evolution on PD was satisfactory in terms of adequacy and fluid balance.

We then reviewed the literature on the specifics of the management of polycystic patients on peritoneal dialysis.

The survival of patients with polycystic disease is identical in PD and hemodialysis. There is no excess risk of technical failure or peritonitis in polycystic patients being treated with PD. However, there are slightly more symptomatic hernias in polycystic patients treated with PD, though this is without impact on technical survival. The measurement of intraperitoneal pressure (IPP) is an aid to prescribing PD, allowing the volume of dialysate to be adapted for exchanges. If kidney reduction is necessary, renal artery embolization seems to be the preferred technique. It is associated with a better likelihood of technical survival, a reduction of temporary or permanent transfers to hemodialysis and a reduction of hospitalization time.

In conclusion, peritoneal dialysis is a viable option for patients with polycystic hepatorenal disease despite organomegaly. Early referral to PD could preserve patients' vascular capital. Healthcare professionals should be educated about survival, technical failure, peritonitis, symptomatic hernias, and the use of PIP to optimize the management of polycystic patients on PD.

Keywords : hepatorenal polycystic disease, peritoneal dialysis

Résumé

La polykystose hépatorénale autosomique dominante (PKR) est une maladie rénale chronique fréquente. La dialyse péritonéale (DP) concerne moins de 7% de ces patients. La sous-utilisation de la DP est due à la crainte d'un échec technique en raison de volumineux organes intra-péritonéaux.

Pour illustrer la faisabilité de la DP chez les patients PKR malgré les organomégalies. nous rapportons le cas d'une patiente de 70 ans atteinte de polykystose hépatorénale, traitée par DP après une longue histoire de transplantation rénale et d'hémodialyse. L'évolution de la patiente en DP a été satisfaisante en termes d'adéquation et d'équilibre hydrosodé.

Nous faisons ensuite une revue de la littérature sur les spécificités de la prise en charge des patients PKR en DP. La survie des patients atteints de polykystose est identique en DP et en hémodialyse. Il n'y a pas de surrisque d'échec technique ni de péritonites chez les patients polykystiques en DP. Cependant, il y a un peu plus de hernies symptomatiques chez les patients polykystiques, sans impact sur la survie technique. La mesure de la pression intra-péritonéale (PIP) est une aide à la prescription, permettant d'adapter le volume de dialysat pour les échanges. En cas de nécessité de réduction néphronique, l'embolisation artérielle rénale semble être la technique à privilégier. Elle est associée à une meilleure survie technique, à une réduction des transferts temporaires ou permanents en hémodialyse et à une réduction du temps d'hospitalisation.

En conclusion, la dialyse péritonéale est une option viable pour les patients atteints de polykystose hépatorénale malgré les organomégalies. Une orientation précoce en DP pourrait préserver le capital vasculaire des patients. Les professionnels de santé doivent être informés sur la survie, l'échec technique, les péritonites, les hernies symptomatiques et l'utilisation de la presssion intrapéritonéale (PIP) pour optimiser la prise en charge des patients polykystiques en DP.

Mots clés : polykystose hépato-rénale, dialyse péritonéale

www.bdd.rdplf.org Volume 6, n° 1, April 2023
https://doi.org/10.25796/bdd.v6i1.76683
ISSN 2607-9917

INTRODUCTION

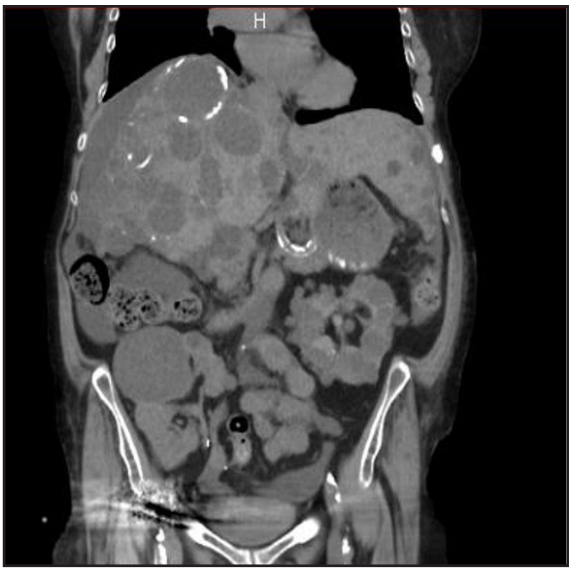
Autosomal dominant polycystic kidney disease is a common chronic kidney disease affecting 1/800 births and accounting for 6-10% of chronic end-stage renal disease cases each year [1]. The main therapies proposed for these patients are transplantation (59%) [2] and hemodialysis (43%). Peritoneal dialysis (PD) is used in less than 7% of polycystic patients [2]. This underuse of PD in polycystic patients is related to an unfounded fear of potential technical failure associated with the presence of large intraperitoneal organs.

In the first part of this article, we report the clinical case of a 70-year-old polycystic patient treated with PD after a long history of renal transplantation and hemodialysis. In the second part, some specific points on the management of polycystic patients with PD will be briefly discussed. The aim of this article is to address the specificities related to the management of polycystic patients on PD in order to facilitate the use of PD in the early stages of their care.

CLINICAL CASE

In 2020, our center was faced with initiation of PD in a 70-year-old female with renal disease secondary to hepatorenal polycystic disease. The patient started hemodialysis in 2006. The period of hemodialysis was marked by multiple vascular access complications and the performance of a right nephrectomy in 2007 as part of the pre-transplant preparation. Renal transplantation was performed in 2009. In 2019, renal function deteriorated due to allograft nephropathy, so a return to hemodialysis was decided, and a two-channel central catheter was placed because of the impossibility of creating an arteriovenous fistula (AVF). The year 2019 was complicated by multiple episodes of *E. faecium bacteremia*, which finally led to a superior vena cava thrombosis in a septic context.

Given the inability to obtain vascular access, the patient was offered PD. The catheter was placed laparoscopically, and a hernia repair of the linea alba was performed simultaneously. At the time of PD, the patient's weight was 53 kg for 1.66 m, and the residual diuresis was 1500 ml/24 h. The abdominal computed tomography (CT) scan of the patient at that time is shown in *Figure 1*.



⬆ *Figure 1. Abdominal CT scan shows the large hepatomegaly, the residual native kidney on the left, and the dysfunctional renal graft in the right iliac fossa*

The patient started continuous ambulatory peritoneal dialysis (CAPD) for 4 months with the following regimen: an infused volume of 1500 ml and 4 exchanges of Iso, Nutrineal, Iso, and Icodextrine. Then, in APD with a total volume of 7500 (Iso + Nutrineal), an infused volume of 1800 ml/exchange, and a long-day dwell with 1000 ml of Icodextrin. The evolution of the patient's intraperitoneal pressure (IPP) is shown in *Table I*.

journal officiel du Registre de Dialyse Péritonéale de Langue Française RDPLF www.rdplf.org

www.bdd.rdplf.org Volume 6, n° 1, April 2023
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Dates	Infused volume (ml)	IPP (cm of water)
2021	1500	11.5
2023	1500	16
2023	1000	12.5

Table I. IPP measurement

The patient's progress on PD was satisfactory in terms of adequacy for PD and hydrosodic balance *(Table II)*.

Table II. Patient's adequacy parameters

	Technique	Creatinine clearance/1.173 m	Kt/v	UF + Diuresis	Estimated RRF	Alb	nPCR
Feb 2021	CAPD	177.82	3.43	1300	13.26	26.6	1.18
Jun 2021	CAPD	146.85	2.3	1400	10.45	27.5	0.84
Dec 2021	APD	147.35	3.05	1450	10.77	29	1.16
April 2022	APD	153.56	3	1550	11.45	27.5	1.20
Aug 2022	APD	123.59	2.55	1000	9.49	27.6	1.06
Nov 2022	APD	112.47	2.06	1100	7.96	29.2	0.90

UF: ultrafiltration, RRF: residual renal function, Alb: albumin, nPCR: normalized protein catabolic rate

CONCLUSION

This clinical case illustrates the feasibility of PD in polycystic patients despite organomegaly. For this patient, an early referral to PD in 2006 could have preserved her vascular capital.

WHAT YOU NEED TO KNOW ABOUT POLYCYSTIC KIDNEY DISEASE AND PERITONEAL DIALYSIS

The survival of patients with polycystic disease is identical in peritoneal dialysis and in hemodialysis

Several studies have examined the survival of patients with polycystic kidney disease treated with peritoneal dialysis (PD). Some studies have used patients treated with PD for nephropathy other than polycystic kidney disease (diabetes, vascular disease) as a control group. These studies show better survival in the polycystic kidney disease group than in the control group [3, 4].
In other studies, the control group is a group of polycystic patients treated with hemodialysis. Again, there was no difference in survival between polycystic patients treated with hemodialysis and those treated with PD [4].

There is no increased risk of technical failure in patients with polycystic disease

A meta-analysis including 9 international studies and more than 7000 patients found no statistically significant difference between the polycystic group and the control group consisting of non-polycystic patients treated with PD. PD is therefore not associated with an increased risk of technical failure in the polycystic population [5].

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www.bdd.rdplf.org Volume 6, n° 1, April 2023
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ISSN 2607-9917

There is no more peritonitis in polycystic patients

In the same meta-analysis, the frequency of episodes of peritoneal infection during PD was compared between the group of polycystic patients and the control group, which consisted of patients with other kidney diseases. No statistically significant difference was found between the two groups [5].

There is slightly more symptomatic hernia in polycystic patients

In a meta-analysis by Dupont et al, an excess risk of hernia was found in the polycystic disease group with an odds ratio of 2.28 (1.28 - 4.12). However, this excess risk did not affect the technical survival of this population [5].

IPP measurement is a prescription aid

One of the problems of polycystic disease is the large volume of the organs (liver and kidneys). this organomegaly is responsible of the reduction of the free surface of the peritoneal cavity available for exchange. Moreover, this organomegaly is also involved in the risk of hyper-IPP, which can lead tothe loss of ultrafiltration by increasing lymphatic reabsorption. In this polycystic population, the identified factors associated with IPP are body mass index (BMI) and organ volume. Measurement and monitoring of IPP is therefore a useful prescription tool for adjusting the volume of the dialysate to be used for exchanges [6].

Renal artery embolization is the preferred nephron reduction technique

The need for kidney reduction in the preparation for kidney transplantation can lead to a delicate period of time. It may be associated with a temporary cessation of PD, a risk of a temporary or definitive switch to hemodialysis, and a risk of a significant reduction in diuresis. In a retrospective multicenter study, Pierre et al. compared the outcomes of nephron reduction by renal embolization versus nephrectomy. Arterial embolization was associated with better technical survival, fewer temporary or permanent switches to hemodialysis, and shorter hospital stays. Therefore, renal arterial embolization appears to be the preferred technique when kidney reduction is required [7].

CONFLICT OF INTEREST

The authors declare no conflict of interest for this article.

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journal officiel du Registre de Dialyse Péritonéale de Langue Française RDPLF www.rdplf.org

https://doi.org/10.25796/bdd.v6i1.76683
ISSN 2607-9917

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received 2023-03-27 accepted after revision 2023-04-01, published 2023-04-25