

Transhepatic catheter access: a case study

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Introduction

A well-functioning vascular access is a mainstay to perform an efficient haemodialysis (HD) procedure. In patients with history of multiple failed vascular accesses for HD, unconventional access to the blood stream such as the transhepatic catheter poses as a last and effective alternative. The percutaneous transhepatic access was initially described for parenteral nutrition administration in 1989 and a few years later Po C.L. *et al.* (1994) reported a case in which this same access was used for HD. Since then, many descriptions of this technique with this objective have been found in the literature (case reports and small case series) as an option for patients with no other available deep venous access.

Objectives

Our aim was to explore a case regarding the possibility and functionality of transhepatic implantation of long-term catheters for HD in a patient with total depletion of the vascular patrimony.

Methods

Descriptive, single holistic case study. The qualitative research was chosen since it provides the opportunity to explore clinical experiences of an elderly woman with a four years transhepatic dialysis catheter. Patient's medical and nursing data were obtained from a central database. To provide a in-depth context of our contemporary phenomenon (case) we analysed several parameters (over a period of eight years, since November 2010 until November 2018). The parameters were: anthropometry, interdialytic weight gain (IDWG), prescribed dry weight, urea reduction ratio (URR), pre and post-dialysis urea, normalized protein catabolic rate (nPCR), equilibrated Kt/V and Kt/V by Daugirdas method: variable-volume single-pool (VVSP); variable-volume double-pool (VVDP).

Results

Case study on a 79 years old female with three sons, widow, in foster family since the death of her husband, semi-bedridden, dependent for activities of daily life, with end-stage renal disease in a regular program of HD since July 2010, 4 hours in Haemodiafiltration, 3 days per week. Our subject has history of alcoholism and suffers from chronic hepatic insufficiency. Comorbidities also include type 2 Diabetes Mellitus, primary Hypertension (diagnosed in May 1980), ischaemic heart disease (history of acute myocardial infarction), cerebrovascular disease (stroke sequelae) and Parkinson disease diagnosed since May 2005. Patient was admitted to the hospital in 14th July of 2010 due to acute myocardial infarction and was diagnosed with kidney failure. Three days later a central venous catheter in the internal jugular vein was inserted and replaced one year later due exteriorization. Other accesses were explored and repeated cannulation attempts were made to establish a well-functioning access (see table 1) and since August 2014 this patient has a transhepatic dialysis catheter with blood flow of 350 mL/h. Regarding anthropometric parameters: Body Mass Index (BMI) was 18.36 kg/m², body surface area BSA=1.45 m², waist circumference WC=103 cm, waist hip-ratio WHR=0.92 and waist to height-ratio WHtR=0.22. The means were: weight=47.10±7.2 kg; IDWG=3.03±0.74% (this parameter showed noteworthy differences pre and post catheter, see graphs); prescription dry weight 62.79±6.96 kg; URR=77.78±6.13%; the pre-dialysis urea was 102,29±28.96 mg/dL; post-dialysis urea 25,45±10.53 mg/dL and normalized protein catabolic rate nPCR=1.01±0.21 g/kg/day. The equilibrated Kt/V was 1.51±0.25; Daugirdas's VVSP Kt/V=1.68±0.31 and VVDP Kt/V=1.46±0.28.

Conclusion

Transhepatic venous catheterization can be a safe and functional alternative route in chronic HD patients without an accessible central venous route. Complications of this technique appear minimal, and in patients without other possible vascular access sites, transhepatic dialysis catheter can be a viable option for vascular access in dialysis, providing a remarkable durable access, in our particular case more than four years. We also are able to attest, in accordance with the finds in the literature, that this is a feasible procedure which presents rates of complication and infection similar to those of usual venous approaches, besides demonstrating long-lasting patency. Ultimately this study case, added to other studies and reports, intends to bring up a discussion on the advantages and disadvantages of this peculiar approach in haemodialysis.

References

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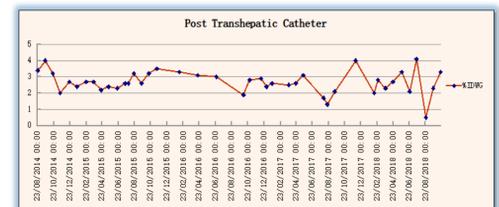
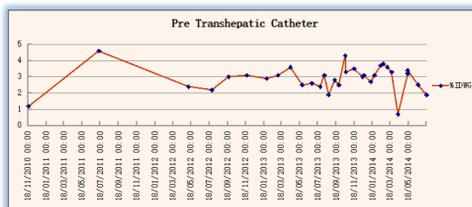
DATE OF CREATION	ANATOMIC POSITION	VASCULAR ACCESS	FAILURE ATTEMPTS	CAUSES OF FAILURE	BLOOD FLOW
09-08-2014	Transhepatic Catheter	Long-term dialysis catheter	—	—	350 ml/h
20-07-2014	Left subclavian	Long-term dialysis catheter	09-08-2014	Cuff Exteriorization	300 ml/h
10-04-2014	Right Femoral	Long-term dialysis catheter	20-07-2014	Removal for other reason	300 ml/h
14-09-2011	Right Femoral	Long-term dialysis catheter	08-04-2014	Other	300 ml/h
19-08-2011	Right Subclavian	Long-term dialysis catheter	14-09-2011	Other	—
27-06-2011	Right Subclavian	Long-term dialysis catheter	18-08-2011	Peri-catheter Bleeding	—
21-04-2011	Left upper internal Jugular	Long-term dialysis catheter	27-06-2011	CVC Related Infection	—
17-01-2011	Right brachiocephalic arm	Arteriovenous fistula	17-01-2011	Thrombosis	—
12-01-2011	Left upper internal Jugular	Long-term dialysis catheter	21-04-2011	Bleeding	—
17-09-2010	Right upper internal Jugular	Long-term dialysis catheter	11-01-2011	Cuff Exteriorization	—



Table 1: History of cannulation attempts

Title: Description of the values under analysis in the period of eight years

	n	Mean	Standard deviation	Minimum	Maximum	Reference values
Pre-dialysis Weight	kg	47.10	7.20	46.30	72.02	Non-existence
Intradialytic Weight	kg	-1.25	1.44	-5.30	3.80	
IDWG	%	3.03	0.74	0.50	4.59	3 to 5%
Presc. Dry Weight	kg	62.79	6.96	46.00	69.00	
Pre-dialysis Urea	mg/dL	102.29	28.96	52	187	
Post-dialysis Urea	mg/dL	25.45	10.53	8	65	
VVSP Kt/V	-	1.68	0.31	0.28	2.26	≥ 1.2
VVDP Kt/V	-	1.46	0.28	0.25	1.97	≥ 1.2
Equilibrated Kt/V	-	1.51	0.25	0.25	1.95	≥ 1.2
URR	%	77.78	6.13	52.62	85.78	
nPCR	g/kg/day	1.01	0.21	0.21	1.75	



Graphs: Interdialytic Weight Gain's behaviour