

中文題目：非尋常的血液透析血管通路：右心房永久性雙腔導管

英文題目：A hemodialysis patient with multiple vascular access failure received sternotomy for right atrium permcath insertion , case report and literature review

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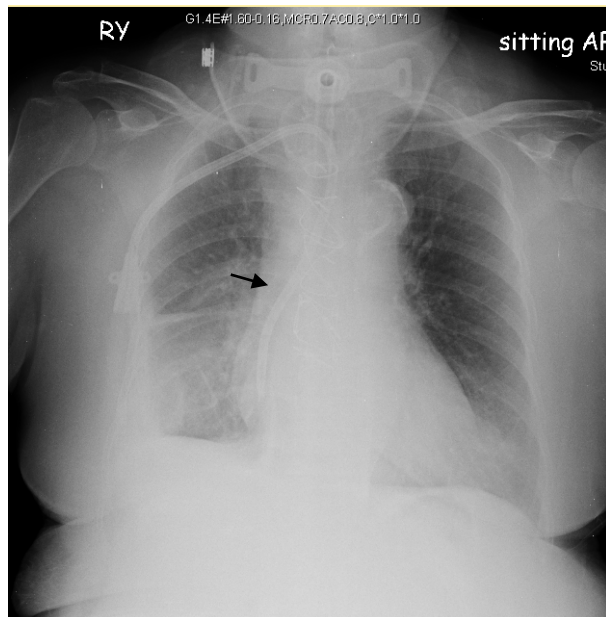
**Background:** Vascular access provide the drainage and return of the blood during hemodialysis process. Long term vascular access for hemodialysis includes arteriovenous fistula (AVF), arteriovenous graft (AVG), and permcath, and recent studies report that type of long term vascular access influence outcome of hemodialysis.<sup>1</sup> When AVF and AVG failed, permcath insertion into central vein will be done, and internal jugular vein was usually the first priority. If internal jugular vein insertion failed, subclavian vein or femoral vein insertion was done, the former has frequent dysfunction and superior vena cava (SVC ) syndrome and the latter has frequent infection episodes. Rarely, multiple vascular access failed, an unusual location of permcath insertion, like tranhepatic vein, translumbar vena cava, or right atrium via sternotomy were reported. In our case, a right atrium permcath via sternotomy was inserted for hemodialysis, as in figure 1

**Case Description:** This 79- year- old women has end stage renal disease and started peritoneal dialysis since 95/5/24, and colon cancer recieved colostomy on 95/8/10, then the modality of dialysis shifted to hemodialysis. Because of difficulty to create AVF or AVG, she recieved hemodialysis via right subclavian permcath since 95/8/29. Multiple and repeated vascular accesses failed, including bilateral internal jugular and femoral veins due to repeated infection and SVC syndrome thereafter. And unfortunately, SVC rupture, massive hemothorax, and cardiac arrest occurred when tried to insert a right subclavian vein permcath. Due to no central vein to insert permcath, a right atrial permcath via open sternotomy was done on 103/08/15. The patient recieved hemodialysis through right atrial permcath smoothly for eight months until she had out-hospital -cardiac-arrest on 104/4/5.

## ***Conclusion:***

We reviewed articles of unusual sites for catheter insertion in patient with difficult vascular access. Reported access sites include right atrium<sup>2</sup>, transhepatic vein<sup>3</sup>, translumbar inferior vena cava<sup>4</sup> and renal veins<sup>5</sup>. In a retrospective study in Turkey<sup>6</sup>, which included 27 patients with multiple venous access failure and with right atrial catheter insertion, hemodialysis with atrial catheterization functioned well for 85% of patients in the mean follow-up of  $27.5 \pm 14.8$  months. Two patient died in postoperative period because of myocardial infarction and fatal arrhythmia. In another case report of 3 patients<sup>2</sup>, the longest duration of primary patency was 4 years and the shortest was 16 months. Francisca Barros<sup>1</sup> and Berta Carvalh<sup>3</sup> reported their experience of transheptic catheter insertion which had an average catheter survival of 1.75 months, and Younes HK and Pettigrew<sup>7</sup> reported a mean time of catheter survival of 87.7 days. Although sporadic cases with arrhythmia, thrombosis were reported, right atrial permcath provide the longest permcath survival and most commonly used among these untraditional insertion sites. Right atrium access can provide adequate blood flow and has better permcath survival, while other's insertion sites has higher failure rate due to thrombosis and infection. Here, we reported our case with 8 months survival after right atrium permcath, as we known, she might be the first case reported in Taiwan.

**Fig.1 permcath inserted into right atrium**



<sup>1</sup> Hemodialysis Vascular Access Modifies the Association between Dialysis Modality and Survival. *J Am Soc Nephrol* 22: 1113–1121, 2011. doi: 10.1681/ASN.2010111155

<sup>2</sup> Case Reports, Intracardiac access for hemodialysis: A case series. *Hemodialysis International* 2009; 13:S18–S23

<sup>3</sup> Alternative vascular access for haemodialysis – a single centre experience in transhepatic and intracardiac catheters. *Port J Nephrol Hypert* 2014; 28(1): 49-54

<sup>4</sup> Percutaneous translumbar placement of a Hickman catheter into the azygous vein. *AJR Am J Roentgenol.* 2000 Nov;175(5):1302-4.

<sup>5</sup> Percutaneous transrenal hemodialysis catheter insertion. *J Vasc Interv Radiol.* 2002 Oct;13(10):1043-6

<sup>6</sup> Right intra-atrial catheter placement for hemodialysis in patients with multiple venous failure. *Hemodialysis International* 2012; 16:306–309

<sup>7</sup> Transhepatic hemodialysis catheters: functional outcome and comparison between early and late failure. *J Vasc Interv Radiol* 2011;22(2):183 -191