

Placement of Tunneled Cuffed Vascular Catheter through Superior Vena Cava Puncture

Li Zhou, Yang Yu, Ping Fu, Tianlei Cui#

Department of Nephrology of West China Hospital, Sichuan University, Chengdu, China, 610041

Correspondence to: Tianlei Cui, email: cuitianleihx@163.com

Purpose:

The purpose of this study is to assess the feasibility and safety of placement of tunneled cuffed catheters via direct percutaneous puncture of superior vena cava in patients with occluded right and left innominate veins.

Materials and Methods:

The retrospective review of all patients with right and/or left innominate vein occlusions who underwent tunneled catheter placement with direct SVC puncture between January 2012 and December 2014. Under fluoroscopic guidance with the patients in a supine position, a 5-F catheter was placed at the distal end of the SVC through the femoral vein, iliac vein, or hepatic vein. This catheter was used as a fluoroscopic target for the puncture. Following the guidance of fluoroscopy, the puncture needle and sheath were placed through a transcutaneous route with the insertion site at 0.5-1.0 cm lateral-inferior to the clavicle head of sternocleidomastoid, with the pathway inferior (caudal) to the clavicle, which allowed the access of the guidewire and the placement of a tCVC.

Results:

The procedure succeeded in all of the 16 patients. During the follow-up (mean: 12 months, range: 3-36 months), access failure due to thrombosis was observed in one patients. The remaining continued to function well until the end of the follow-up period or until the death of the patients (n=3). No pneumothorax occurred. The most common complication was mediastinal hematoma after puncture failure in 5 patients. The diameter of the maximum hematoma was 2.2cm and all resolved spontaneously.

Conclusions:

In patients with central vein occlusion and exhaustion of the conventional insertion sites, the tCVCs can be safely placed through superior vena cava puncture using transcutaneous route.

Characteristic	Number
Number	16
Age	64.7±13.9
Male/Female	10/6
BMI	23.7±3.6
Blood Pressure	
SBP	158.2±27.3
DBP	93.0±16.8
Primary Disease	
Diabetes Mellitus	6 (32.5%)
Glomerular Disease	10 (62.5%)
Others	0 (0%)
Cardiavascular Disease	1
Dialysis Ages	5±2.8
Previous Vascular Access	
0	0 (0%)
1	1 (6.25%)
>=2	15 (93.75%)

Abbreviations: BMI, Body Mass Index; SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure

Case	Gender	Age	Dialysis (year)	Previous AVF Attempts	RIJV	LIJV	RIV	LIV	RFV	LFV
Case 1	Male	73	2	3	occlusion	thrombus	occlusion	stenosis	thrombus	thrombus
Case 2	Female	50	5	2	occlusion	normal	occlusion	occlusion	normal	thrombus
Case 3	Male	51	7	3	occlusion	thrombus	occlusion	serious stenosis	occlusion	normal
Case 4	Female	65	4	2	occlusion	thrombus	occlusion	normal	thrombus	normal
Case 5	Female	62	10	3	occlusion	thrombus	occlusion	normal	occlusion	thrombus
Case 6	Male	65	3	1	occlusion	normal	occlusion	normal	thrombus	normal
Case 7	Male	30	7	4	occlusion	thrombus	occlusion	normal	thrombus	thrombus
Case 8	Male	71	5	5	occlusion	thrombus	occlusion	normal	thrombus	normal
Case 9	Female	64	8	5	occlusion	thrombus	occlusion	normal	occlusion	thrombus
Case 10	Male	65	3	4	occlusion	thrombus	occlusion	normal	thrombus	normal
Case 11	Male	81	5	2	serious stenosis	normal	occlusion	stenosis	thrombus	thrombus
Case 12	Male	85	2	2	occlusion	serious stenosis	occlusion	serious stenosis	thrombus	normal
Case 13	Male	75	1	2	tortuous	thrombus	occlusion	serious stenosis	occlusion	thrombus
Case 14	Male	50	5	3	occlusion	thrombus	occlusion	occlusion	occlusion	thrombus
Case 15	Female	71	10	2	occlusion	thrombus	occlusion	serious stenosis	thrombus	normal
Case 16	Female	77	3	2	occlusion	thrombus	occlusion	tortuous	occlusion	thrombus

Abbreviations: RIJV, Right jugular internal vein; LIJV, Left jugular internal vein; RIV, Right innominate vein; LIV, Left innominate vein; RFV, Right femoral vein; LFV, Left femoral vein;

Case	Access of Angiography	Puncture Times*	Artery Injury	mediastinal hematoma	maximum diameter	pneumothorax
case1	RFV	2	None	None		None
case2	RFV	2	None	1	1.4cm	None
case3	LFV	2 operations (3,1 respectively)	None	1	2.2cm	None
case4	LFV	2	None	None		None
case5	LFV	2	None	None		None
case6	LFV	2 operations (3,2 respectively)	None	1	1.9cm	None
case7	RFV	2	None	None		None
case8	LFV	2 operations (3,1 respectively)	None	None		None
case9	LFV	2	None	None		None
case10	LFV	1	None	None		None
case11	LFV	2	None	None		None
case12	LFV	2 operations (3,1 respectively)	None	1	1.3cm	None
case13	LFV	3 operations (2,3,1 respectively)	None	1	1.3cm	None
case14	Hepatic vein	3	None	None		None
case15	LFV	2	None	None		None
case16	LFV	2	None	None		None

Abbreviations: RFV, Right femoral vein; LFV, Left femoral vein;

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Sections

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