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Diagnosis of Atypical Central Venous Stenosis in Hemodialysis Patient: A Case Report

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Case Study : A 70-year-old female with end-stage renal disease secondary to diabetic nephropathy on maintenance hemodialysis presented to Lifeline Clinic with forearm edema and elevated venous pressure. Her medical history included an implantable cardiac pacemaker with a lead traversing the left subclavian vein to the right heart and a previously created radiocephalic arteriovenous fistula. Physical examination revealed forearm edema and an aneurysmal, tortuous cannulation segment with pulsatile characteristics. Ultrasound showed brachial artery flow of approximately 1500ml/min, with all superficial veins at the elbow interrupted, leaving only the brachial vein as the outflow tract. We performed straightening surgery to correct the tortuous outflow through the perforator vein, which improved edema and reduced pressure. But two months later, the patient returned with recurrent elevated venous pressure and pulsatile vessel characteristics. Repeat physical examination revealed pulsatility from the arteriovenous anastomosis site to the axillary area. Ultrasound showed no significant stenosis up to the axillary area, suggesting downstream stenosis. Despite the absence of typical central venous stenosis symptoms like facial edema, fistulogram revealed no significant axillary vein stenosis but suggested possible stenosis at the venous thoracic outlet of the subclavian vein. Due to the atypical presentation and risk of worsening stenosis with empirical angioplasty, intravascular blood pressure measurement was performed, revealing a dramatic gradient between the SVC (3mmHg) and left brachiocephalic vein (74mmHg), with minimal additional gradient (76mmHg) at the suspected thoracic outlet. The left brachiocephalic vein is typically obscured by aorta and airway shadows, and the absence of collateral vessels made identifying the culprit lesion challenging. Following precise localization and treatment of the actual lesion, the patient showed significant flow improvement and successful hemodialysis in the subsequent session.

fig1.png

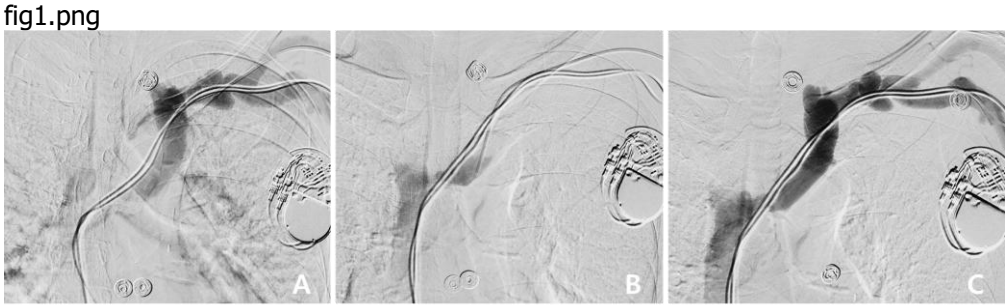

fig1.png

Measurement Site	Pressure before PTA (mmHg)	Pressure post PTA (mmHg)
Superior Vena Cava	20/0 (3)	10/5 (7)
Brachiocephalic vein, Left	113/53 (74)	23/15 (18)
Subclavian vein, Left	112/53 (76)	36/19 (26)