Pseudoaneurysm of Thyrocervical Trunk Following Left Internal Jugular Vein Cannulation

A 35-year-old woman with end-stage renal disease (ESRD) on maintenance hemodialysis through left brachiocephalic arteriovenous fistula (AVF) presented with spontaneous thrombosis of AVF. A blind percutaneous temporary catheter placement in the left internal jugular vein was attempted by Seldinger technique with an 18 G introducer needle. The procedure was abandoned following an arterial puncture. The patient was subsequently dialyzed through a right femoral vein temporary catheter. The patient complained of dysphagia immediately after the failed neck cannulation. Physical examination of the neck was unremarkable. Upper gastrointestinal endoscopy was normal. A contrast-enhanced computed tomography of the neck and thorax revealed a pseudoaneurysm 14.5 mm × 14.8 mm with the feeding vessel arising from the thyrocervical trunk [Figure 1a and b]. The pseudoaneurysm was compressing the esophagus [Figure 2a]. Doppler examination revealed the "typical to-and-fro" waveforms characteristic of pseudoaneurysm. Neurological examination of the left upper limb was normal. An ultrasound-guided compression (USGC) was done which resulted in thrombosis of aneurysm [Figure 2b]. The dysphagia settled within 2 days of USGC, and the patient was discharged after fashioning a right brachiocephalic AVF.

Blind cannulations of the jugular veins are complicated by arterial puncture, through and through cannulation of the jugular vein and accidental injury to pleura and adjoining deep thoracic structures. Carotid arterial puncture is the most commonly encountered complication with a reported prevalence rate varying from 2% to 16%. The reported prevalence of carotid arterial puncture following blind jugular catheter placement from India is 2.3%.[1] Pseudoaneurysms can occur following accidental arterial puncture, with a prevalence varying from 0.05% to 2%.[2] Cardiac catheterization and dialysis vascular access placement accounts for majority of iatrogenic pseudoaneurysms. Approximately 50%–70% of iatrogenic pseudoaneurysms are located in femoral arteries.[3,4] Thyrocervical trunk is an uncommon location for pseudoaneurysms. Underlying coagulopathy and platelet dysfunction resulting from ESRD are considered to be additional risk factors for pseudoaneurysm.[3] The presence of a communicating neck with the arterial luminal wall with a "to-and-fro" pattern of waveforms (yin-yang phenomenon) on Doppler ultrasound is diagnostic.[5]

Pseudoaneurysms may undergo rupture with consequent bleeding, may increase in volume and compress the adjacent nerves and veins, or may disappear by spontaneous thrombosis. Chances of spontaneous thrombosis are less in the presence of continued anticoagulation. Nonsurgical management options include compression with sandbags or compression devices, USGC, thrombin therapy, arterial embolization, or endovascular stent graft insertion.[3,4] USGC has been successfully used to treat femoral arterial pseudoaneurysms, whereas it is often not suitable for carotid artery due to thromboembolic complications. Long-standing, multiloculated, wide-necked aneurysms with high flow rates often fail to respond to USGC. USGC is contraindicated in case of large hematomas and injury to adjoining structures. Surgical management as a primary modality is employed when there is a rapid expansion of the pseudoaneurysm with impending rupture, distal ischemia or distal emboli, or extensive soft-tissue damage. USGC seems to a feasible option in noncarotid neck aneurysms without neurovascular compression. Blind venous catheter placement can result in inadvertent arterial punctures with life-threatening complications. Blind catheter placement should be reserved for emergency situations such as trauma and cardiac resuscitation. Ultrasound-guided central venous cannulations should be the standard of care in elective/semi-elective scenarios.

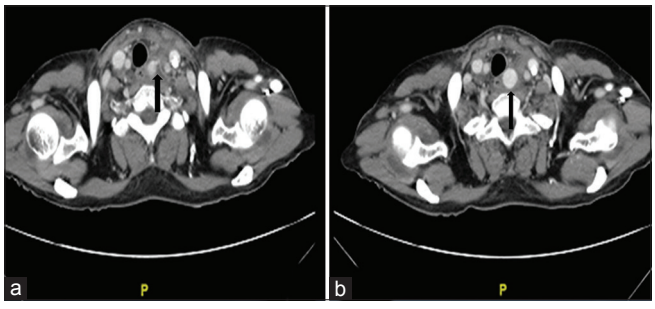

Figure 1: (a) Contrast-enhanced computed tomography thorax, coronal section showing a pseudoaneurysm with a feeding vessel from thyrocervical trunk. (b) Contrast-enhanced computed tomography thorax, showing a well-defined enhancing pseudoaneurysm compressing the esophagus on the left side

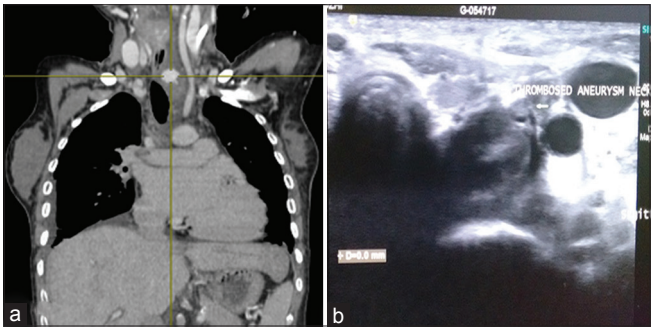

Figure 2: (a) Contrast-enhanced computed tomography thorax, sagittal section showing the pseudoaneurysm compressing the esophagus on the left side. (b) Doppler ultrasonography showing thrombosed neck of the aneurysm sac after ultrasound-guided compression

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Conflicts of interest

There are no conflicts of interest.

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