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Case Report

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Post Traumatic Pseudo-Aneurysms From A Branch of Thyro-cervical Trunk and External Carotid Artery With Concomitant Arteriovenous Fistula-A Rare Entity and Diagnostic Challenge in Interventional Radiology

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ABSTRACT

Pseudo-aneurysms from branches of thyro-cervical trunk and external carotid artery lie in deep tissues of the neck. Iatrogenic and post traumatic cases are the most common cause[1]. Pseudoaneurysm with concomitant arteriovenous fistula present a great challenge for Interventional Radiologists. The chances of other small co-existing pseudo-aneurysm is also possible in such cases and they maybe masked by the larger out pouching making the management even more complex and therefore the Interventional radiology team needs to be vigilant while dealing with such cases. We report a case of a 30 year old male with two pseudo-aneurysms arising from a branch of thyro-cervical trunk and external carotid artery with concomitant arteriovenous fistula following stab wound injury to the left side of neck.

Key Words: *pseudo-aneurysm, arteriovenousfistula, embolization, traumatic, thyrocervical trunk, external carotid artery*

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INTRODUCTION

Thyro-cervical trunk is the second branch of subclavian artery. Both external carotid artery and thyro-cervical trunk are embedded in the deep tissues of the neck and hence well protected their pseudo-aneurysms are also therefore also rare. Blunt, penetrating as well as iatrogenic injuries are well documented causes of pseudo-aneurysm[2,3]. Patient maybe asymptomatic or may present with a swelling which is pulsatile[1]. Pseudo-aneurysms can result in rupture or they can increase in size that may cause mass effect resulting in vascular compression and neurological symptoms. CTA has a sensitivity and specificity of more than 95 % in detecting pseudo-aneurysm and arteriovenous fistula however the gold standard is digital subtraction angiography, which offers crucial information about collateral blood supply[4].Previously the treatment of choice was open surgical repair which resulted in high morbidity and longer periods of recovery. However with recent advancement regarding embolization and stent placement, it is considered the first line management. Despite the fact that there are reported cases of successful embolization of pseudo-aneurysm of thyro-cervical trunk and its branches, there are still only few cases which show an associated arteriovenous fistula therefore it is still difficult to handle situations in which a pseudo-aneurysm and a concomitant fistula is present[5]. It is also very important to look at the small feeding branches of aneurysm as they can be missed. If a large aneurysm exists, it can mask or cover up small other concomitant pseudo-aneurysms so it is important to follow-up to not just look at the coil position but also to see if any new out pouching is visible. To the best of our knowledge this is the first case report from Pakistan on a successful mbolization of pseudo aneurysm and arteriovenous fistula involving branch of thyrocervical trunk and external carotid artery.

CASE REPORT

30 year old male presented in the emergency department of our hospital with as tab wound injury to the left side of the neck. He was initially manage data periphery hospital where his neck wound was stitched. He complained of nausea and difficulty in breathing for which his chest x-ray was done which revealed a left side dhemo-pneumothorax. A chest tube thoracostomy was done in the emergency department. He was vitally stabilized after which he was examined by the ENT team and there examination revealed a pulsatile mass in left supraclavicular region and bruit was heard in this region. He was advised an urgent CT scan neck and chest. His CT scan revealed a contrast filled out pouching in inter

muscular planes of lower one third of left side of neck representing a pseudo aneurysm arising from a branch of left subclavian artery likely thyrocervical trunk. A possibility of communication with adjacent vein was raised.

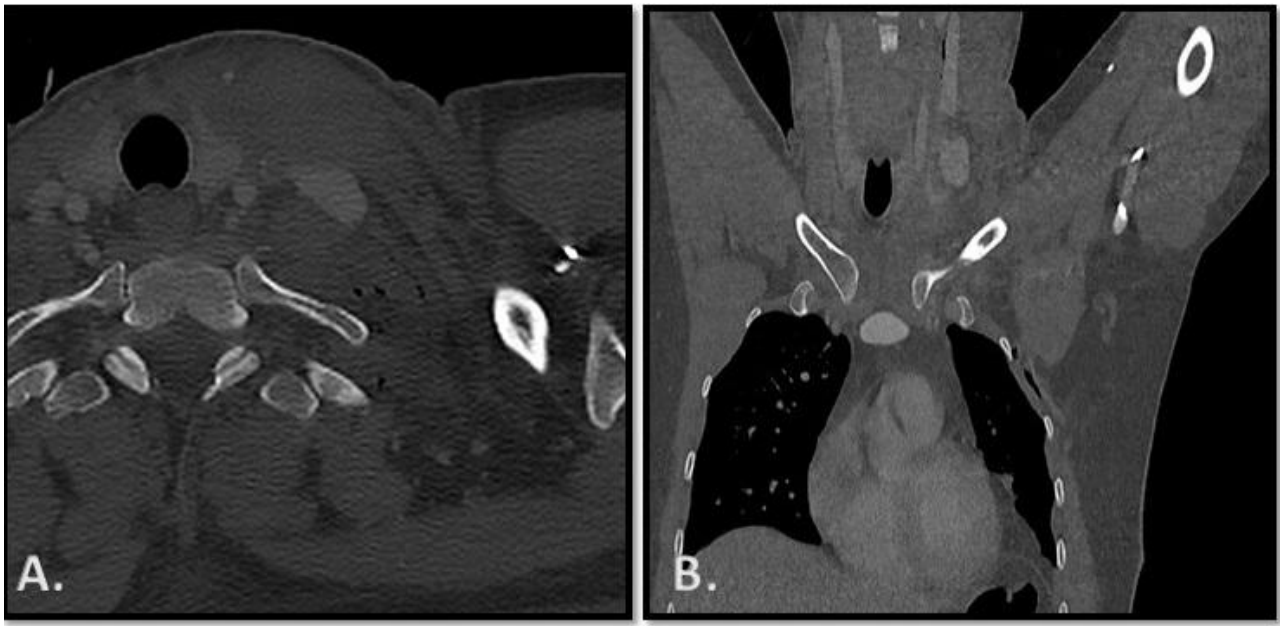

Figure 1ct scan neck coronal view demonstrating a contrast filled outpouching at level of thyrocervical trunk with a possible arteriovenous fistula.

Embolization was then planned and interventional radiologists were taken onboard. After written and informed consent under fluoroscopic and ultrasound guidance via access route of right common femoral artery an angiogram was obtained which also demonstrated an out pouching from a branch of thyrocervical trunk and filling of left internal jugular vein representing arteriovenous fistula (figure II). Using a 5 frcatheter, the aneurysm was embolized via lipoidal, glue and multiplemicro coils. Post embolization showed complete exclusion of flow from aneurysm with no new outpouching.

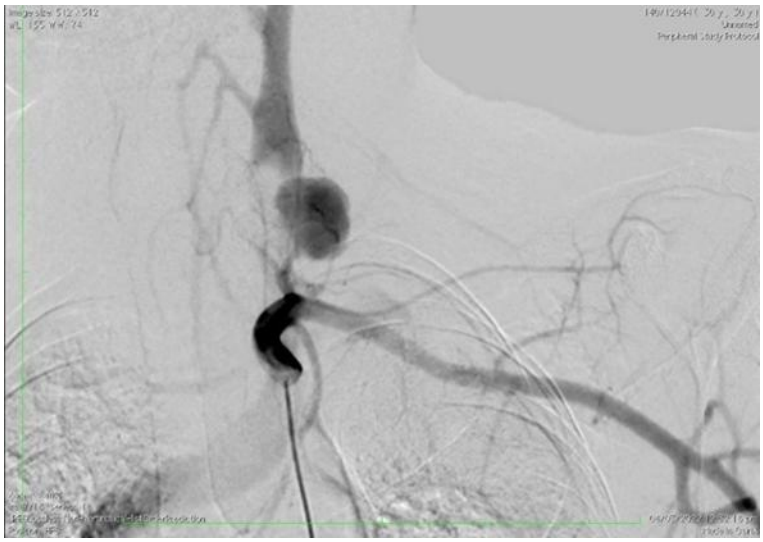

Figure II angiogram demonstrating outpouching at thyrocervical trunk with arteriovenous fistula

On follow-up the following day post embolization, another out pouching was visualized from superior thyroid artery on ultrasound. Patient was then again taken to interventional radiology suite and angiogram was obtained under fluoroscopic and ultrasound guidance which demonstrated another pseudo aneurysm arising from left superior thyroid artery (figure III). Using micro catheter selective successful embolization was done using glue and lipoidal. The patient was again followed up the next day on ultrasound which showed complete resolution of aneurysm and no new out pouching was observed. Patient remained vitally stableso was discharged and was advised to follow-up in OPD. 1 month after embolization patient again presented in our department for follow-up ultrasound which showed embolization material in place with no new out pouching (figure IV).

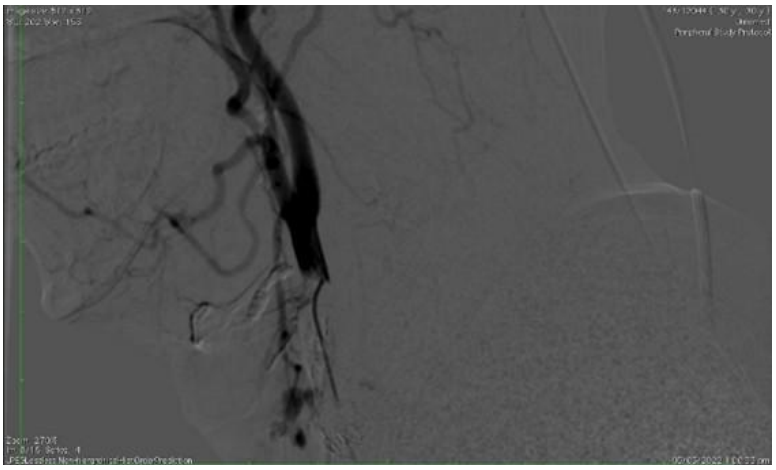

Figure III angiogram the following day demonstrating another out-pouching from left superior thyroid artery

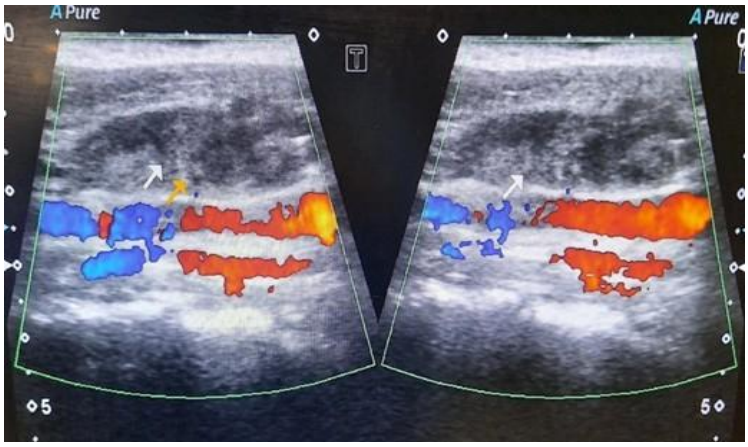

Figure IV ultrasound neckdemonstratingembolizationmaterialwiththepseudo-aneurysmwithitscompleteocclusion

DISCUSSION

In our case report we have described a successful case of embolization of branch of thyrocervical trunk and superior thyroid artery aneurysm with a concomitant arteriovenous fistula. As previously stated, pseudo aneurysms from these arteriesarer are due to there location deep within the neck. In a literature review done by Michael S. Rallo on pseudo aneurysms with or without concomitant AVFs involving thyrocervical trunk and its branches, about 61.5% iatrogenic in origin and only 26.9% with a penetrating or blunt traumaticincident[6].

The treatment of pseudo aneurysms and AVFs of the thyrocervical trunk is dependent on their location, and the presence or absence of these coexisting conditions. In cases with single and branch lesions, relatively simple percutaneousor endovascular procedures are employed with coil embolization of involved arteries. In cases where pseudo aneurysm is located at the root of the thyrocervical trunk and with an associated arteriovenous fistula, as seen in our case, is believed to be more complex[5]. Penetrating injuries to the neck may result in multiple pseudo aneurysms hence even after stenting of the major vessel responsible, it might not result in complete resolution of pseudo aneurysm similar to our case. Duncan W Ramsay, in his case reports also stated the potential problem with a large false aneurysm of the CCA that was also supplied by branches of the thyrocervical trunk and external carotid artery along with a fistula with the internal jugular vein. However, with careful selective eangiography, these problems can be addressed with a combination covered stents and coil embolization[7].

Using non-invasive technique such as CTA, magnetic resonance angiography(MRA), or Doppler ultrasonography (DUS) can help establish diagnosis ofPseudoaneurysm.DUS can help in detecting aneurysm by assessing the flow which shows a ‘to and fro’ motion. Conventional angiography is an invasive technique, however it provides a more complete picture of defect size and locationand hence considered diagnostic. It also has the added benefit of providing information about collateral vessels that must be obtained prior to endovascular treatment[1].

CONCLUSION

In conclusion, the timely treatment of head and neck PA with concomitant AVF is necessary for avoiding high risk

complications. Our case report showed that with penetrating trauma more than one pseudoaneurysm can exist and it important to pay attention to small feeding vessels and to also look for any concomitant arteriovenous fistula. Our case report also revealed that trans-catheter arterial embolization is a successive technique in managing such conditions.

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