BANGLADESH JOURNAL OF RADIOLOGY AND IMAGING 2024; VOL. 32(2): 142-144

Grade III Pseudoaneurysm of Right Common Carotid Artery Following Blunt Trauma - A Case Report

MOHAMMED NAZRUL ISLAM[1], MAHMUD HASAN MOSTOFA KAMAL[2], REHANA PARVIN RUMA[3], SYEDA NAZLEE MOSTOFA[3], ANINDITA DATTA[4]

Abstract

Post traumatic pseudoaneurysm of common carotid artery is uncommon, but can lead to life threatening complications. Early diagnosis of this rare entity is very much important for treatment planning and good prognosis. Multi Detector Computed Tomography (MDCT) plays a very important role in this regard. A 42 years old gentleman presented with pulsatile neck swelling one and half months after road traffic accident. Contrast enhanced MDCT revealed pseudo-aneurysm of right common carotid artery (CCA).The patient was advised for endovascular treatment. Our report also suggests that, any patient with history of blunt or penetrating trauma in carotid region should go through a standard investigative work-up for early diagnosis of any carotid arterial injury.

Keyword: *Pseudoaneurysm, blunt trauma, CCA, MDCT.*

Introduction

Pseudoaneurysm is a pulsating encapsulated hematoma developing in connection with the lumen of a ruptured vessel after an injury to all layers of the arterial wall[1].

Pseudoaneurysm of common carotid artery is extremely rare and mostly caused by blunt or penetrating trauma[1,2,3]. Extracranial carotid artery pseudoaneurysm and aneurysm account for only 0.4-4% of peripheral artery aneurysm[4]. Common carotid artery pseudoaneurysm accounts for only 0.1- 0.3% of all extracranial pseudoaneurysm[4,5,6.] Clinically, pseudoaneurysm may be clinically silent, or may present as pulsatile neck mass with local and systemic signs due to compression, thromboembolism or can rupture with catastrophic consequence[2,3]. Frequency of this condition seems to be increasing, but simply may be due to increased diagnosis by better imaging techniques, such as contrast enhanced MDCT[3].

Author of correspondence: Dr. Mohammed Nazrul Islam, Associate Professor, Department of Radiology & Imaging, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka

Case Report

A 42 years old gentleman, had blunt trauma at neck region about one and half months back. Then he gradually developed right sided neck swelling which was pulsatile. However his vital sign were normal and no other local sign was present. He was advised for MDCT of neck and came to Radiology & Imaging department of BSMMU. Non contrast CT scan (Figure 1) revealed a rounded isodense area measuring about 45 mm antero-posterior, 40 mm craniocaudal & 54 mm in transverse diameter, was noted at right side of the neck compressing and displacing trachea towards left. The lesion was displacing sternocledomastoid muscle anteriorly. The lesion could not be separated from proximal part of right CCA. On post-contrast CT (Figure 2), the lesion showed intense vascular enhancement. So it was a pseudoaneurysm arising from proximal part of right CCA.

1. Assistant Professor, 2. Associate Professor, 3 MD Resident, 2. Associate Professor, Department of Radiology & Imaging, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka

Received: 11 May, 2023 **Revised:** 18 December, 2023 **Accepted:** 12 February, 2024 **Published:** 1 July, 2024

Fig.-1: *Non-contrast CT scan showing an isodense lesion in lower part of neck, displacing trachea to left and splaying sternocledomastoid muscle.*

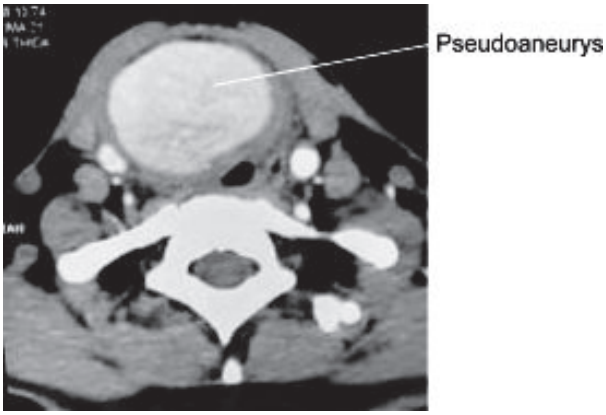

Figure 2: Post contrast CT scan of neck showing intensely enhancing pseudoaneurysm arising from proximal part of right CCA.

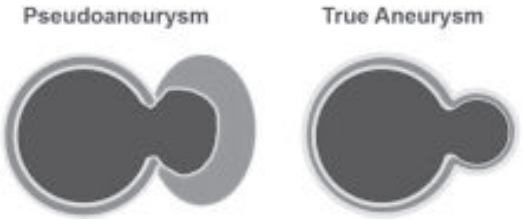

Fig.-3: *Difference between pseudoaneurysm and true aneurysm*

Table I
Blunt carotid arterial injury scale

Injury grade	Description
I	Luminal irregularity or dissection with <25% luminal narrowing
II	Dissection of intramural hematoma with >25% luminal narrowing, intraluminal clot, orvisible intimal flap
III	Pseudoaneurysm
IV	Occlusion
V	Transection with free extravasation, hemodynamicallysignificant arteriovenous fistulae

Discussion

Pseudoaneurysm is a vascular abnormality caused by a damaging force on an arterial wall which results in a persistent extravasation of blood into the surrounding tissue.[7]

When the integrity of the arterial wall is directly disrupted, transmitted pressure across the injury site allows for a connection between the artery and the outside space and forms a post-traumatic pseudo-aneurysm.[8] In contrast to true aneurysm (Figure 3), it lacks three layered structure, consist only single layer of fibrous tissue and hence it is more prone to sudden rupture.[3] It is usually surrounded by hematoma.

Trauma (penetrating or blunt), infection, inflammation, iatrogenic causes like percutaneous drainage, biopsy, surgery or catheterization procedure may result in arterial wall disruption and pseudoaneurysm formation.[3] According to Biffle scale for blunt carotid arterial injury, pseudoaneurysm considered as grade III lesion.[9]

Our case presented with only pulsatile neck swelling. However no neurological deficit or another sign was present. Contrast enhanced

MDCT confirmed the presence of a pseudoaneurysm of right CCA. So it falls into grade III blunt carotid arterial injury. It can take few hours to several years, usually within five years, after initial arterial injury for development of pseudoaneurysm, but delayed presentation after 10 years has also

been reported[10,11]. As MDCT is non-invasive, widely available, less time consuming and has high sensitivity & specificity, so it has been used as a diagnostic modality in many institutions.

Conclusion

Any patient with history of blunt cervical trauma followed by a pulsatile neck mass, possibility of a pseudoaneurysm of CCA must be considered. Contrast enhanced MDCT should be done in all patients having history of blunt trauma and it can be the sole pre- operative diagnostic modality.

References

1. Jariwala P, Punjani A, Kamble R. Endovascular management of the post-traumatic common carotid artery pseudoaneurysms. Pol J Radiol. 2021 May 12;86: e287-e290
2. Kim HO, Ji YB, Lee SH, Jung C, Tae K. Cases of common carotid artery pseudoaneurysm treated by stent graft. Case Rep Otolaryngol. 2012; 2012:674827.
3. Keeling AN, McGrath FP, Lee MJ. Interventional radiology in the diagnosis, management, and follow-up of pseudoaneurysms. Cardiovasc Intervent Radiol. 2009 Jan;32(1):2-18.
4. Rojas D, Stefanov S, Riera Del Moral L, Álvarez J, Riera de Cubas L. Endovascular treatment of posttraumatic pseudoaneurysm of the common carotid artery. Case Rep Vasc Med. 2015; 2015:427040.
5. Gupta K, Dougherty K, Hermman H, Krajcer Z. Endovascular repair of a giant carotid pseudoaneurysm with the use of Viabahn stent graft. Catheter Cardiovasc Interv. 2004 May;62(1):64-8.
6. Yamada R, Miller C, Guimaraes M, Schonholz C. Overview of endovascular management of traumatic carotid lesions. Endovasc Today 2016; 15: 79-82
7. Bansal A, Gorsi U, Farook S, Savlania A, Sandhu MS. Interventional radiology management of extremity pseudoaneurysms: a pictorial essay. EmergRadiol. 2021 Oct;28(5):1029-1039.
8. M. Lou; Q. Zhang; Z. Chen; J. Yin; X. Chen; X. Zhang (2011). Open Repair of a Post-traumatic Pseudo-aneurysm of the Common Carotid Artery that Presented with Carotid Sinus Syndrome: A Case Report, 22(5), 0–0.
9. Biffl WL, Moore EE, Offner PJ, Brega KE, Franciose RJ, Burch JM. Blunt carotid arterial injuries: implications of a new grading scale. J Trauma. 1999 Nov;47(5):845-53.
10. Shaikh R, Sohail S, Shaikh PA, Nisa QU. Pseudoaneurysm of Left proximal Common Carotid Artery following penetrating trauma. Pak J Med Sci. 2017 Sep-Oct;33(5):1291-1293.
11. Law Y, Chan YC, Cheng SW. Endovascular repair of giant traumatic pseudo-aneurysm of the common carotid artery. World J Emerg Med. 2015;6(3):229-32.