

## Case Report

# Mycotic pseudoaneurysm mimicking carotid body tumor

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### ABSTRACT

Masses in carotid space can be of varied etiology. These usually displace the parapharyngeal space anteriorly. They can arise from various structures and may be cystic or solid. Carotid body tumors are neural crest in origin and usually cause splaying of carotid vessels resulting in "Lyre sign". Presented in this case report is a hypermetabolic mass resulting from mycotic aneurysm mimicking carotid body tumor.

**Keywords:** Mycotic aneurysm, FDG PET CT scan, Carotid body tumor, Pseudoaneurysm

### INTRODUCTION

The term mycotic aneurysm was introduced by Osler to describe aneurysm associated with bacterial endocarditis.<sup>1</sup> It is characterized by breach in the wall of an artery resulting in an out pouching that is contiguous with lumen of the artery.<sup>2</sup> Mycotic aneurysm can occur as a result of embolization of vasa vasorum, infection of a pre-existing defect with circulating organisms, contiguous involvement of a vessel from an adjoining source of sepsis, direct impregnation of an infected vascular trauma.<sup>3</sup> Computer tomography (CT), magnetic resonance imaging (MRI), Doppler study can detect mycotic aneurysm in a clinically suspected situation.<sup>4</sup> These modalities also help in differentiating other causes of carotid space masses. FDG PET CT detects metabolically active carotid space lesion and there are case reports of carotid artery pseudoaneurysm diagnosed incidentally while being evaluated for pyrexia.<sup>5</sup>

### CASE REPORT

76 years male presented with cough of one month duration. There was no hemoptysis, weight loss, dysphagia or hoarseness. CT scan showed centrilobular

nodules suspicious of tuberculosis. Bronchoalveolar lavage was negative for AFB or malignant cells. Sonography of neck showed a mass 37×33×30 mm at carotid bifurcation. There was no prior cardiovascular event. Heart function was normal on echocardiography. He was referred for PET scan to look for possible occult primary.

PET CT was performed with 8 millicuries of Fluorine 18-fluorodeoxyglucose (FDG) administered intravenously on six hours fasting state and whole body images were acquired at 60 minutes using Siemens Horizon 16 slice positron emission tomography- computed tomography (PET CT) scanner.

Non-contrast study was done in view of septicemia and deranged renal function.

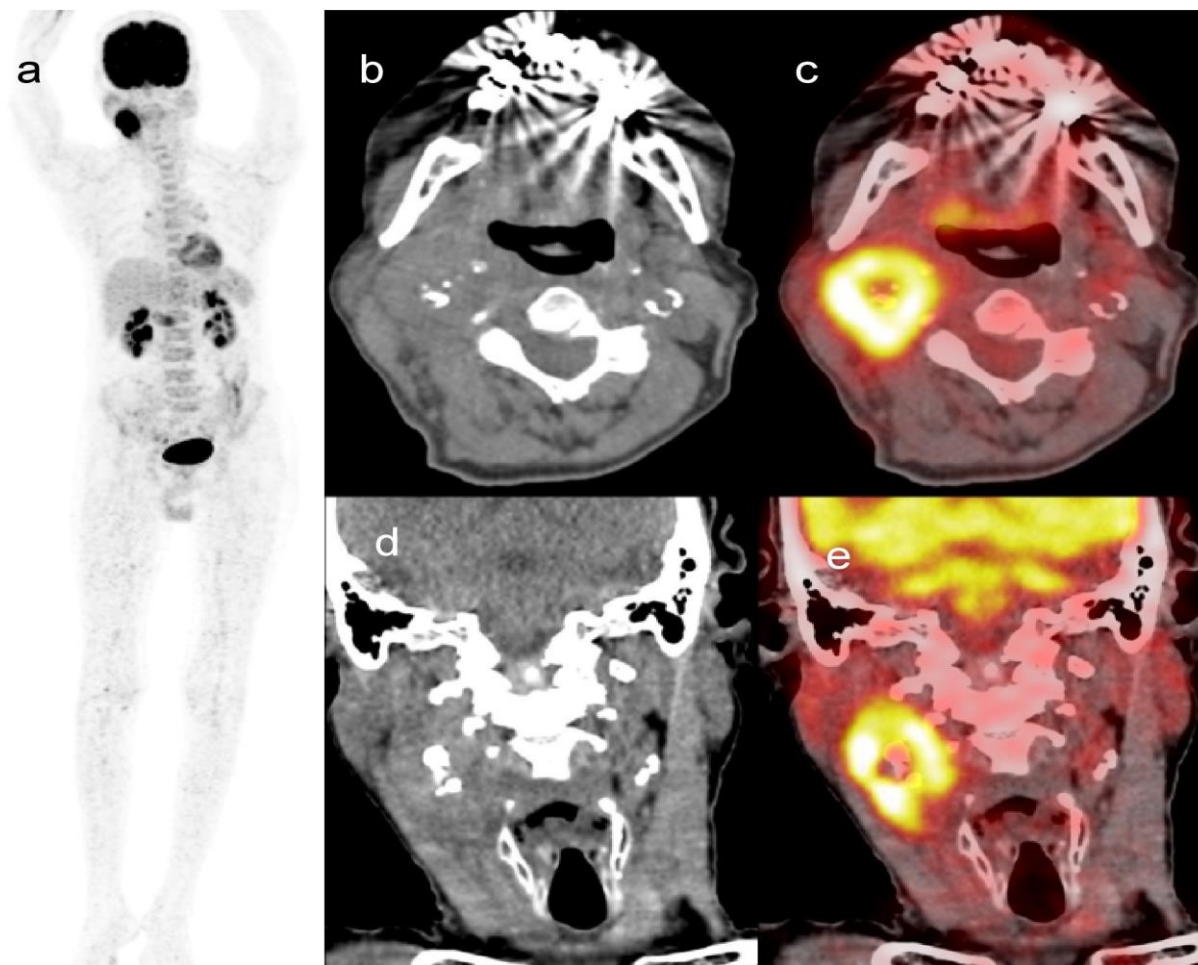
FDG PET CT scan showed a hypermetabolic soft tissue mass in right carotid space measuring 33×34 mm SUV 14.83 (Figure 1). Superiorly the lesion was seen to reach upto the post styloid space without reaching upto the skull base. Inferiorly it was seen to extend upto carotid bifurcation.

Splaying of carotid arteries was noted (Lyre sign). Smaller FDG avid right neck nodes were seen at level III upto 10×9 mm SUV 5.56.

There was no focal hypermetabolic lesion in pharynx-larynx or oral cavity to suggest occult primary.

A differential diagnosis of NHL, carotid body tumor and metastatic carcinoma to neck node with unknown primary was made.

He subsequently underwent carotid angiography that revealed localized extravasation of contrast at the carotid bifurcation with delayed washout characteristic of a pseudoaneurysm (Figure 2). The common carotid and proximal external carotid arteries were coiled. Post coiling angiogram revealed obliteration of the common carotid and proximal external carotid arteries with no flow in the pseudoaneurysm. As the blood culture isolated *E. coli* organisms a diagnosis of mycotic aneurysm was made. The patient was subsequently treated with antibiotics.



**Figure 1: FDG PET CT scan shows a hypermetabolic mass in right side of neck on whole body MIP images (a). Rest of the scan was quite unremarkable. Axial images at the level of neck shows an FDG avid soft tissue mass in right carotid space (b, c) with specks of calcification centrally. Coronal view localized the mass between the internal and external carotid arteries.**

## DISCUSSION

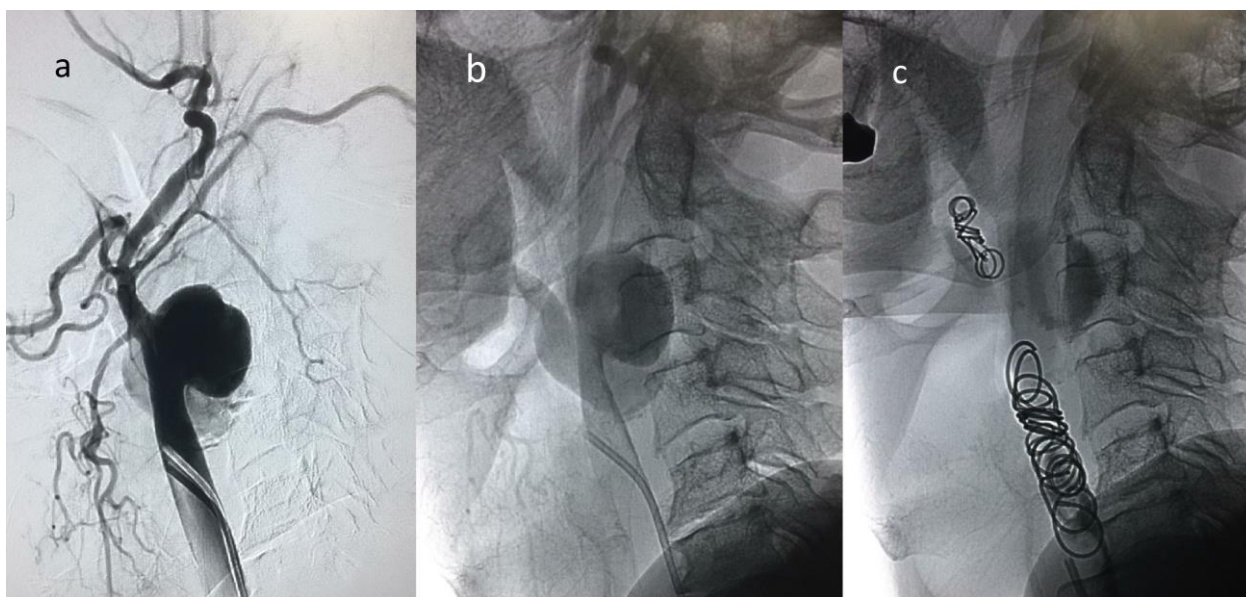
FDG PET CT is a sensitive diagnostic tool to detect occult lesions. Our case presented with cough and preliminary investigations revealed inflammatory changes in lungs. Bronchial lavage was inconclusive. PET scan showed a hypermetabolic mass in right carotid space. In view of its location and lyre sign (splaying of carotid arteries at bifurcation of common carotid) a possibility of carotid body tumor was made.<sup>6</sup>

Carotid body tumors are common paragangliomas of neck. They are derived from neural crest cells at carotid bifurcation. They are hypervascular neoplasms. MRI is the test of choice and delineates the tumor from surrounding structures with characteristic punctate or serpentine flow voids on T2 sequences. Usually the ascending pharyngeal artery is the feeder and AV shunting may be seen on angiography.<sup>7</sup>

Differential diagnosis include glomus vagale tumor (paraganglioma from vagus nerve). These are usually

more cranial in location than carotid body tumors. These are also hypervascular and a feeder can be demonstrated on angiogram. Half of these may present with hoarseness of voice secondary to vocal cord paralysis.<sup>8</sup>

Shwannomas and paragangliomas arise within carotid sheath and may displace carotid vessels. Nodal masses displace arteries and vein together.



**Figure 2: Selective right common carotid angiogram shows localized extravasation of contrast at the carotid bifurcation a). Delayed washout characteristic of a pseudoaneurysm b). Coiling of common carotid and proximal external carotid arteries c). legends for figures are before the annotation 2c . eg. coiling of common carotid and proximal external carotid arteries.**

Shwannomas in carotid sheath may arise from any of the last four cranial nerves. These are benign slow growing neoplasms and are devoid of flow void on MRI as seen in paragangliomas.

They may present with absence of gag reflex, dysphagia, palatal paresis, vocal cord paresis, atrophy of sternocleidomastoid or trapezius muscle or deviation of tongue.<sup>9</sup>

Carotid space (old post styloid parapharyngeal space) contains vessels, nerves. Common carotid artery, internal and external carotid arteries, internal jugular vein, lowers four cranial nerves, ansa cervicalis, sympathetic plexus are within the carotid sheath. Sympathetic chain is not enclosed in carotid sheath though it lies within the space. Lymphatic tissue may also enlarge in this space.

Masses in carotid space can be congenital (branchial cyst), granulomatous cause (tubercular lymphadenitis), neoplastic nodes (e.g., metastatic squamous cell carcinomas, lymphoma), neurogenic tumor (paraganglioma), vascular (aneurysm, hematoma, pseudoaneurysm).

Aneurysm of an artery is ectasia with all three layers being intact. Pseudoaneurysm results from perforation of the artery that is lined with inflammatory tissue. It may be lined with the walls of a clot, connective tissue or adventitia. It may result from parapharyngeal space

sepsis, trauma, invasion of neoplasm, radiotherapy. Pearson et al reported a case of pseudoaneurysm of internal carotid artery post excision of carotid body tumor.<sup>10</sup> However, in the present case the cause of pseudoaneurysm was *E. coli* septicemia and hence final diagnosis of mycotic pseudoaneurysm.

## CONCLUSION

Hypermetabolic neck masses on PET CT may have numerous differentials. Possibility of vascular causes as pseudoaneurysms should be ruled out with appropriate investigations for early diagnosis and appropriate treatment.

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## REFERENCES

- Osler W. The Gulstonian lectures on malignant endocarditis. *Br M J.* 1885;1:467.
- Kaufman SL, White RI Jr, Harrington DP. Protean manifestations of mycotic aneurysm. *Am J Roentgenol.* 1978;131(6):1019-25.
- Nakata Y, Shionoya S, Kamiya K. Pathogenesis of mycotic aneurysm. *Angiology* 1968;19(10):593-601.
- McCullum CH, Wheeler WG, Nova GP et al. Aneurysms of the extracranial carotid artery: twenty

- one years experience. *Am J Surg.* 1979;137:196-200.
5. Jaruskova M, Belohlavek O. Role of FDG PET CT in the diagnosis of prolonged febrile states. *Eur J Nucl Med Mol imaging* 2006;33(8):913-918.
  6. Power AH, Bewley AF, Joe JK. Carotid body tumors. Stanley JC, Veith FJ, Wakefield TW. *Current therapy in vascular and endovascular surgery*, 5th ed. Elsevier, Philadelphia; 2014: 141-145.
  7. Arya S, Rao V, Juvekar S, Dcruz AK.. Carotid body tumors: objective criteria to predict the Shamblin group on MR imaging. *Am J Neuroradiol.* 2008;29(7):1349-54.
  8. Day TA, Bewley AF, Joe JK. Neoplasms of the neck. Flint PW, Haughey BH, Lund V, et al. *Cummings Otolaryngology*, 6th ed. Philadelphia: Elsevier; 2015: 1787-1804.
  9. Chong VF, Fan YF. Pictorial review: Radiology of the carotid space. *Clin Radiol.* 1996;51:762-8.
  10. Pearson SE, Choi SS. Pseudoaneurysm of the internal carotid artery: A case report and review of literature. *Arch Otolaryngol Head and Neck Surg.* 2005;131:454-6.

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