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Research Article

A CASE OF LARGE EXTRACRANIAL PSEUDO-ANEURYSM FOLLOWING CAROTID STENTING TREATED BY INTERPOSITION ePTFE GRAFT: A CASE REPORT

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ABSTRACT

Common carotid artery pseudo-aneurysm following stenting are very rare and potentially harmful, however appropriate treatment is warranted in order to prevent neurologic complications and rupture. We describe a case of failed carotid stenting resulting a large extra-cranial carotid pseudo-aneurysm who was treated with an interposition 5mm ePTFE graft. A 62-year-old man presented with pulsatile mass on the left side of the neck with a palpable thrill and systolic bruit and on evaluation with Duplex scan and computed tomographic angiography confirmed a case of pseudo-aneurysm of the left common carotid artery (50mm × 34 mm). A 5mm e-PTFE graft was used as an interposition graft after excision of aneurysmal sac and postoperatively, patient was advised to take Ecosprin 75mg daily for life long. There were no postoperative complications, and on the 7th post-operative day patient was discharged from the hospital in good ambulatory condition. After a follow-up of 18 months, the bypass graft was patent and there were no neurologic complications.

INTRODUCTION

A pseudoaneurysm is defined as the extravasation of blood leading to formation of a pulsatile mass surrounded by localized fibrous tissue which is devoid of all three layers of vessel. This finding distinguishes it from a true aneurysm, in which the arterial wall is intact but expanded to produce pulsatile mass.[1] In comparison to other locations, pseudoaneurysm of the carotid artery are quite rare and are almost always the result of blunt or penetrating trauma.[2] Extra-cranial carotid aneurysms are an uncommon entity, comprising 0.4% to 4% of all peripheral aneurysms; only 0.1% to 2% of all surgical carotid procedures are performed for aneurysms.[1,2,3] The causes of CCA pseudo-aneurysm include blunt or penetrating trauma, infection, and vasculitis, as well as iatrogenic and unknown causes. Extra-cranial carotid aneurysms are a rare entity and carry an inherent risk of thromboembolic complications. Treatment options consist of endovascular and conventional surgical techniques.[3]

Common carotid artery (CCA) pseudoaneurysm is usually discovered as pulsate neck mass. The neurological deficit due to compression of nerve can also be seen. The intracranial occlusion or intracranial embolus can occur due to thrombus. This may lead to rupture; the results of which can be fatal, so immediate treatment is necessary.[3] Local pain and a pulsating mass in the neck are the most frequently described symptoms.[1,4,5] Patients might also present with ischemic stroke, transient ischemic attack, amaurosis fugax, or cranial nerve compression. Most patients, however, remain asymptomatic. Carotid artery aneurysms are usually diagnosed by means of ultrasonographic scanning. Additional diagnostic testing by computed tomographic angiography, magnetic resonance

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imaging, or angiography; can lead to more accurate information on the aneurysm's size and its relationship to surrounding structures.[4] Most aneurysms in the carotid vasculature occur at the level of the common carotid artery, followed by that of the internal carotid artery. Aneurysms of the external carotid artery are extremely rare.[6] Although most carotid artery aneurysms are caused by atherosclerosis, other common causes include trauma and infection. Less common causes are cystic medial necrosis, Takayasu arteritis, Marfan syndrome, and idiopathic medial arteriopathy.[2,6,7]

The standard treatment for CCA pseudoaneurysm was surgical repair including ligation of the carotid artery with or without bypass procedure and arterial reconstruction. However, in recent years to avoid surgical morbidity, endovascular intervention has been the effective alternatives in the treatment of pseudoaneurysm.[2,8] Indications for intervention arise chiefly from the risk of rupture and embolic sequelae, or from the presence of cranial nerve dysfunction.[7,8,9] Treatment options includes surgical excision with an interposition graft, ligation of the artery, and endovascular exclusion with a stent-graft.[8,9]

CASE REPORTS

A 62-year-old man presented with a history of hypertension, hypercholesterolemia, diabetes mellitus, and smoker presented with a past medical history of carotid artery stenting at 7 months back due to carotid artery stenosis. Physical examination revealed a pulsatile mass on the left side of the neck with a palpable thrill and systolic bruit. Duplex ultrasonographic scanning and computed tomographic angiography (Figure-1) confirmed the diagnosis of a saccular aneurysm of the left common carotid artery (diameter, 50mm × 34 mm), with the history of left carotid artery stenting a few months back (Figure-2). There were mild atherosclerotic changes in right carotid artery.

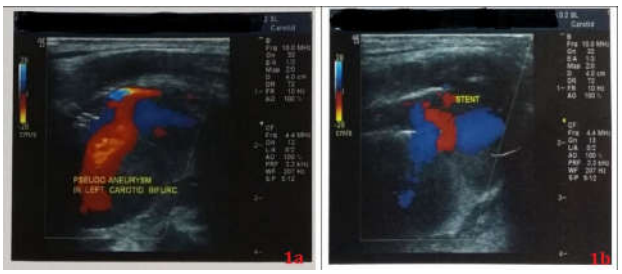

Figure 1 Duplex scan of left carotid vessels demonstratespseudo aneurysm in left common carotid artery (CCA) bifurcation (1a); Stent in situ in left CCA (1b).

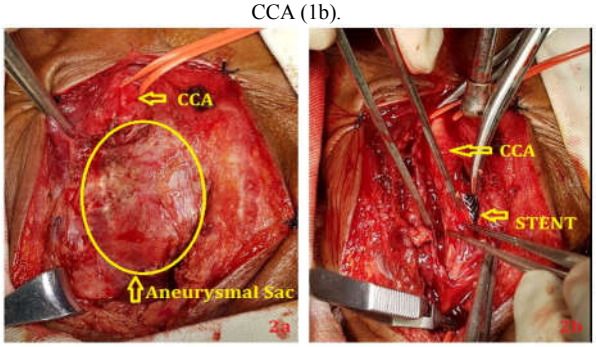

Figure 2 Per-operative findings demonstrate a large swelling over carotid region (2a) (yellow mark); Stent in situ CCA (common carotid artery) (2b).

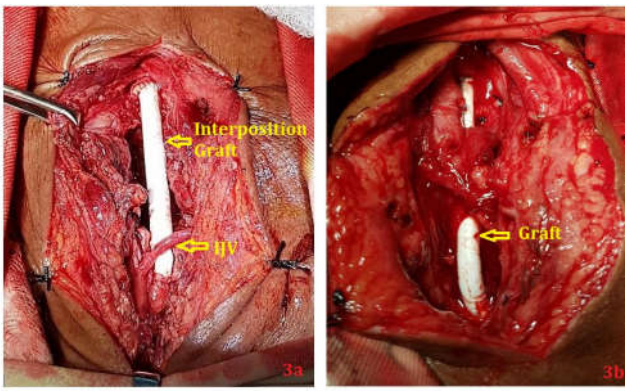

Figure 3 Interposition 5mm ePTFE graft between proximal and distal healthy parts of Common carotid artery (3a), (3b).

The procedure was performed with the patient under general anesthesia and without monitored by electroencephalography (EEG) or transcranial Doppler (TCD) echocardiography. Incision and proper exposure of the carotid bifurcation area was done, followed by systemic heparinization (heparin 100 IU/kg) to achieve ACT (activated clotting time) of 300-350s, and then the carotid artery was clamped.

The aneurysmal sac was exposed with a longitudinal incision just anterior to sternocleidomastoid muscle and meticulous dissection was performed to expose common carotid (CCA), internal carotid (ICA), external carotid artery (ECA) and also identified the cranial nerve (CN) to prevent unwanted CN injury. Then aneurysmal sac was opened after clamping CCA, ICA and also ECA. However, after partial resection of aneurysmal sac carotid stent and mural thrombus was removed. Then a 5mm e-PTFE graft was used to bypass aneurysmal part as an interposition graft (Figure-3) between proximal and distal part of CCA. During the entire procedure, the ECG remained normal and no temporary shunt had to be used. Throughout the procedure systolic blood pressure (SBP) was above 80mmHg. In early postoperative period, Heparin infusion was used bridging to oral antiplatelet agent. On discharge from hospital, patient was advised to take combination of Clopidogrel and Ecosprin (75mg) daily for life long. There were no postoperative complications, and on the 7th post-operative day patient was discharged from the hospital in good ambulatory condition. After a follow-up of 18 months, the bypass graft was patent and there were no neurologic complications.

DISCUSSION

In this present article, we have shown that carotid artery aneurysms can be safely treated with interposition ePTFE grafts. In our review, we excised aneurysmal sac, evacuated thrombus from cavity, and removed stent from common carotid artery; followed by anastomosis between proximal and distal part of CCA using a 5mm ePTFE graft. There was no perioperative strokes or other major neurologic complications. This results are in concordance with observations of previous articles of surgical excision of carotid aneurysms.[3,7,10]

Endovascular repair of carotid aneurysms has been described as a quick and less invasive alternative that causes fewer nerve injuries.[8,9,11,12,22] Endovascular repair can especially benefit high-risk patients: that is, those with severe comorbidity or with a “hostile neck” unsuitable for surgery. However, the

main concern associated with endovascular procedures in the carotid artery are the risk of embolic complications remains. underdiagnosed, because there are only few reports on endovascular treatment of carotid aneurysms. However, there are also several reports of successful endovascular exclusion of traumatic carotid pseudoaneurysms also.[9,11,12,13]

El-Sabrout and Cooley observed a rate of 9% mortality or stroke and an incidence of 6% for cranial nerve injury in a study of surgical treatment of carotid aneurysms.[9] However, during postoperative follow-up, about 28% of the patients had died mainly due to cardiac causes at approximately 6 years follow up period.[9] However, Zhou *et al*. retrospectively compared 2 cohorts of patients with carotid aneurysm.[11] Patients in the first group had undergone operative repair in the first 10-year period, and patients in the second group had undergone either surgical correction (30%) or endovascular exclusion (70%) in the second 10-year period. Zhou concluded that treatment of extra-cranial carotid artery aneurysms had largely evolved from operative to endovascular intervention. Benefits of endovascular treatment included shorter convalescent times and less cranial nerve injury.[11] In a multicenter study, Radak *et al*. observed that 51% of all carotid aneurysms are saccular,[14] which is also supported by other authors like Patel *et al*.[20]

At present, the indications for intervention in patients with extra-cranial carotid aneurysms have not been completely defined.[15,16] In a study involving 57 patients, Attigah *et al*. showed the long-term outcome of surgical treatment of extracranial carotid artery aneurysms in 2009.[17] The incidence of perioperative stroke was 2%, and 6% patients had experienced TIA (transient ischemic attack). However, about 6% and 20% of all patients had suffered from permanent and transient cranial nerve injury, respectively. With a follow-up period of 5, 10, 15, and 20 years, the actuarial survival rates were 90%, 77%, 65%, and 57%; and the ipsilateral stroke-free rates were 96%, 96%, 93%, and 87%, respectively.[17] However, in the presence of symptoms, an intervention is clearly indicated. To date, the risk of complications of an asymptomatic aneurysm and its relation to issues like aneurysmal diameter and plaque instability have not been studied. The choice between endovascular repair and conventional surgery can depend on various factors, including the type of aneurysm, comorbidities, symptoms, and the experience and preference of the surgeon.[18,19] The relatively low incidence of these lesions makes it difficult to obtain sufficient experience with both surgery and endovascular procedures for carotid aneurysm. However, this study report has shown the short term follow-up outcome but certainly suggest that ePTFE interposition graft is a useful alternative in cases failed endovascular treatment or in treating complication like pseudoaneurysm following carotid endovascular stenting, which is also supported by other article.[11,17,21,22]

CONCLUSION

We demonstrate that interposition ePTFE grafting of large extra-cranial carotid pseudo-aneurysms can be done safely, though there is high risk for cranial nerve injury. However, there was no perioperative neurological complications in our patient.

References

1. Bernhard VM, Johnson WD, Peterson JJ. Carotid artery stenosis. Association with surgery for coronary artery disease. *Arch Surg*.1972; 105:837-840.
2. Stehbens WE. Aneurysms. In: Vascular pathology, aneurysm. Stehbens WE, Lie JT, editors. London: Chapman & Hall Medical; 1995. p. 369.
3. Knight GC, Hallman GL, Reul GJ, Ott DA, Cooley DA. Surgical management of extra-cranial carotid artery aneurysms: report of 17 cases. *Tex Heart Inst J*. 1988; 15(2):91-97.
4. Quigley F, Matalanis G, Doolan L. Aneurysm surgery. In: Faris I, Buxton B, editors. Practice of surgery. London: Churchill Livingstone; 1995. P. 258-263.
5. Pearson SE and Choi SS. Pseudoaneurysm of the internal carotid artery: a case report and review of the literature. *Archives of Otolaryngology*. 2005; 131(5): 454-456.
6. Nadig S, Barnwell S, Wax MK. Pseudoaneurysm of the external carotid artery-review of literature. *Head and Neck.* 2009; 31(1):136-139.
7. Keeling AN, McGrath FP, Lee MJ. Interventional radiology in the diagnosis, management, and follow-up of pseudoaneurysms. *CardioVascular and Interventional Radiology.* 2009; 32(1):2-18.
8. Rosset E, Albertini JM, Magnan PE, Ede B, Mathieu JP, Branchereau A. Surgical treatment of extra-cranial internal carotid artery aneurysms. In: Branchereau A, Jacobs M, editors. Goldstone J. Aneurysms of the extra-cranial carotid artery. In: Rutherford RB, editor. Vascular surgery. 6th ed. Philadelphia: Elsevier Saunders; 2005. p. 2052-2064.
9. El-Sabrout R, Cooley DA. Extra-cranial carotid artery aneurysms: Texas Heart Institute experience. J *Vasc Surg.* 2000;31 (4):702-712.
10. Koebbe CJ, Liebman K, Venzedaroglu E, Rosenwasser R. The role of carotid angioplasty and stenting in carotid revascularization. *Neurol Res*.2005; 27:53-58.
11. Zhou W, Lin PH, Bush RL, Peden E, Guerrero MA, Terramani T, *et al*. Carotid artery aneurysm: evolution of management over two decades. *J Vasc Surg*. 2006;43(3):493-497.
12. Simionato F, Righi C, Melissano G, Rolli A, Chiesa R, Scotti G. Stent-graft treatment of a common carotid artery pseudoaneurysm. *J EndovascTher*. 2000;7(2):136-140.
13. Kang HS, Kwon BJ, Roh HG,Yoon SW, Chang HW, Kim JE, *et al*. Intra-arterial tirofiban infusion for thromboembolism during endovascular treatment of intracranial aneurysms. *Neurosurgery*. 2008; 63(2):230-237.
14. Radak D, Davidovic L, Vukobratov V, Ilijevski N, Kostic D, Maksimovic Z, *et al*. Carotid artery aneurysms: Serbian multi-centric study. *Ann Vasc Surg.* 2007; 21(1):23-29.
15. Bellosta R, Sesana M, Baglini R, Luzzani L, Talarico M, Sarcina A. Endovascular treatment of a symptomatic carotid artery aneurysm with a stent graft. *Vasc Endovascular Surg.* 2008; 42(3):276-278.
16. Simionato F, Righi C, Melissano G, Rolli A, Chiesa R, Scotti G. Stent-graft treatment of a common carotid

artery pseudoaneurysm. *Journal of Endovascular Therapy*. 2000; 7(2):136-140.
17. Attigah N, Kulkens S, Zausig N, Hansmann J, Ringleb P, Hakimi M, *et al*. Surgical therapy of extra-cranial carotid artery aneurysms: long-term results over a 24-year period. *Eur J VascEndovasc Surg*. 2009;37(2):127-133.
18. Chan AW, Yadav JS, Krieger D, Abou-Chebl A. Endovascular repair of carotid artery aneurysm with Jostent covered stent: initial experience and one-year result. *Catheterization and Cardiovascular Interventions*. 2004; 63(1):15-20.
19. Mukherjee D, Roffi M, Yadav JS. Endovascular treatment of carotid artery aneurysms with stent grafts. *J Invasive Cardiol*. 2002; 14(5):269-272.
20. Patel JV, Rossbach MM, Cleveland TJ, Gaines PA, Beard JD. Endovascular stent-graft repair of traumatic carotid artery pseudoaneurysm. *Clin Radiol*. 2002; 57(4):308-311.
21. Posacioglu H, Apaydin AZ, Parildar M, Buket S. Large pseudoaneurysm of the carotid artery: in Behçet's disease. *Texas Heart Institute Journal*. 2005; 32(1):95-98.
22. Snatulli G. Epidemiology of cardiovascular disease in the 21st century: updated numbers and updated facts. *JCvD*. 2013; 1:1-2.

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