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Case Report

Hybrid approach in a difficult case of pseudoaneurysm of right common carotid artery



Dilip Kumar^{a,*}, Saujatya Chakraborty^b, Sunip Banerjee^c

^aHead of Academics & Senior Interventionist, Medica Institute of Cardiac Science, Medica Superspecialty Hospital, 127, Mukundapur, EM Bypass, Kolkata 700099, India

^bConsultant Cardiologist & Interventionist, Medica Institute of Cardiac Science, Medica Superspecialty Hospital, 127, Mukundapur, EM Bypass, Kolkata 700099, India

^cDirector, Consultant Cardiologist & Senior Interventionist, Medica Institute of Cardiac Science, Medica Superspecialty Hospital, 127, Mukundapur, EM Bypass, Kolkata 700099, India

ARTICLE INFO

Article history:

Received 9 October 2015

Accepted 27 December 2015

Available online 12 January 2016

Keywords:

Hybrid approach

Intervention

Carotid

Pseudoaneurysm

ABSTRACT

We present the case of a 65-year-old gentleman, who presented with a symptomatic pseudoaneurysm of the right common carotid artery. Because of high surgical risk, endovascular approach was decided upon. However, taking hardware across the lesion via the aortic arch provided us with insurmountable difficulties. Therefore, a hybrid approach was resorted to, in which an arteriotomy was done in the carotid artery followed by direct implantation of the stent. We were thus able to create a favorable trade-off between the high surgical risk of a full surgical procedure and the peri-operative benefit of an endovascular approach.

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1. Introduction

Endovascular interventional techniques are rapidly becoming the preferred treatment options for carotid artery disease because of their less invasive nature and relative ease of performance. Improvement in catheter-based technologies coupled with increasing operator experience is leading to employment of such techniques for more complex lesions with increasing procedural success. However, obstacles still remain in treating certain complex lesions with difficult anatomies by the endovascular route. Employment of a hybrid

approach of surgical exposure followed by endovascular techniques may help in surmounting such challenges.

2. Case report

The index patient was a 65-year-old gentleman, who had developed a pulsatile swelling in the right side of the neck for the last two years. This was slowly increasing in size. Consequently, he also developed hoarseness of voice. He also complained of generalized weakness and had gradual decrease in functional capacity.

* Corresponding author.

E-mail addresses: dilipcadio@gmail.com (D. Kumar), scmdmed@gmail.com (S. Chakraborty), drsunip@yahoo.com (S. Banerjee).

<http://dx.doi.org/10.1016/j.ihj.2015.12.023>

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Physical examination showed a pulsatile painless mass, which clinically looked like an aneurysm. A Doppler ultrasound showed a large pseudoaneurysm measuring 5.8 cm × 4.2 cm arising from the right common carotid artery. Digital subtraction angiogram also revealed a large pseudoaneurysm from the right common carotid artery. Echocardiography revealed poor left ventricular systolic function (EF 25%) along with moderate MR. Coronary angiography was done for pre-operative risk stratification, which revealed triple vessel disease.

The patient was considered to be at considerable risk for general anesthesia and open surgical procedure in view of the limited functional capacity and severe LV dysfunction. Therefore, he was taken up for carotid artery stenting by endovascular route. Initially, femoral arterial access was taken. However, because of a very sharp take-off of the right brachio-cephalic trunk coupled with tortuous course, it was difficult to negotiate guiding catheters into the carotid arterial system (Fig. 1). This was notwithstanding the fact that wires could be easily negotiated across the diseased segment. Multiple catheters with differently shaped ends were tried viz. Judkins right, multipurpose, amplatz, and simon.

Therefore, a decision was taken to attempt cannulation via the radial route. During the course of intervention, the right subclavian artery was found to be occluded 5 mm from its origin. The left brachial artery was next accessed in order to take advantage of the curve of the guiding catheters so as to get extra support of the inner aortic arch wall. However, although wires (including extra-stiff wires) could be easily negotiated, the catheters were found to prolapse into the ascending aorta.

Faced with a difficult situation, the endovascular procedures were abandoned and all options were re-evaluated. A hybrid approach involving open access to the common carotid artery using general anesthesia followed by deployment of an endovascular covered stent was felt to be a reasonable option. The common carotid artery was lifted using two sutures at either end. Then arteriotomy was done in right carotid artery (Fig. 2). Cut down of the carotid artery was followed by introduction of 11 cm direct introducer sheath. Using purse string sutures edges around the delivery sheath was secured and deployment of Fluency Plus (8 mm × 40 mm) vascular stent graft was performed. This deployment was relatively easy and allowed completion of the procedure within a relatively short period of time.

Post closure of the incision, a drain was kept in situ. The patient was safely extubated and had an uneventful

post-operative course. The patient was discharged after four days of the procedure. In follow-up visit, the patient was found to be doing well.

3. Discussion

The optimal management of carotid artery disease is still a matter of research and appraisal.¹ Carotid artery stenting is emerging as a viable alternative to surgical endarterectomy for treatment of symptomatic extracranial carotid artery disease.² Consequently, the number of patients being treated by percutaneous methods is rapidly increasing.³

However, what is intuitively and logically true is that there remain subsets of patients who are at high risk of surgery, either because of anesthetic considerations or other surgical risk factors. This patient had severe left ventricular dysfunction and a high risk of peri-operative adverse outcomes. Therefore, he was taken up for carotid stenting.

However, as demonstrated by this case, the tortuosity of the carotid arterial system remains the major limiting factor in achieving procedural success. Although a multiplicity of guiding catheters are available to engage the common carotid artery, the degree of support may still be inadequate to take bulky delivery systems across. This entails a considerable manipulation of the carotid arterial tree and the subsequent risk of embolization and endothelial injury. There is also an increased risk of radiation exposure and contrast use.

The use of arteriotomy in such cases has several advantages. These include ease of access, a more co-linear route for delivering stents and ease of use of bulky systems. Conceptually, the arteriotomy procedure should not result in increased peri-procedural stroke vis a vis endarterectomy. However, given the ease with which stent deployment was achieved, there may be decrease in procedural times and rates of stroke. This is an area where greater experience and data are required. Occasional case report exists, where hybrid approaches utilizing the advantages of both approaches have been utilized in treating carotid aneurysm.⁴

In conclusion, the use of surgical access is promising in ensuring procedural success in CAS, especially in patients at high risk of surgery. It is beneficial in cases with high risk of anesthesia and also where surgeons are apprehensive of risk of rupture of the carotid aneurysm. How the use of this hybrid procedure compares against CEA or CAS is an exciting avenue that needs to be explored.

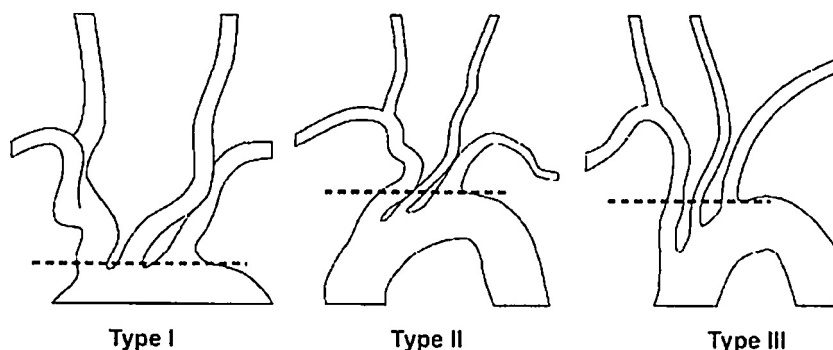


Fig. 1 – Types of arch.

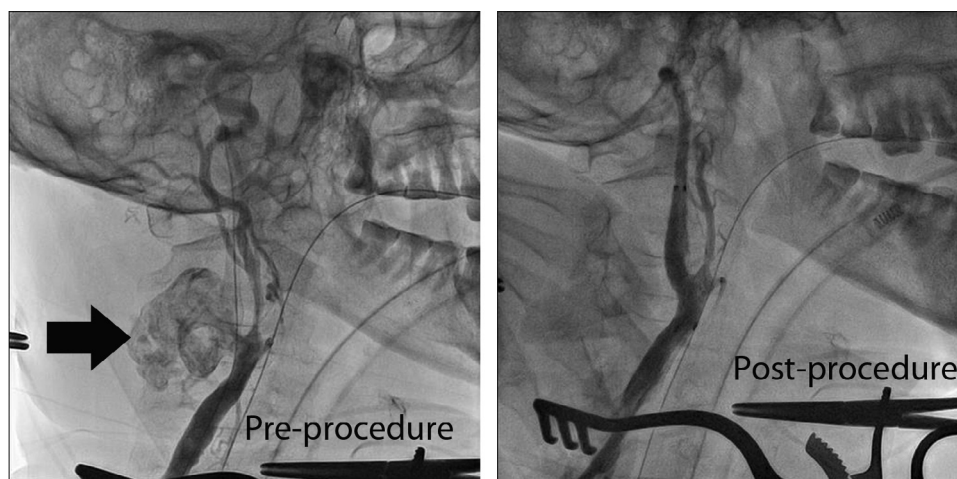


Fig. 2 – Pseudoaneurysm before (left) and after stent deployment (right).

Conflicts of interest

The authors have none to declare.

REFERENCES

1. Zhang L, Zhao Z, Ouyang Y, et al. Systematic review and meta-analysis of carotid artery stenting versus endarterectomy for carotid stenosis: a chronological and worldwide study. *Medicine*. 2015;94:e1060 [PubMed PMID: 26131824; Pubmed Central PMCID: 4504641].
2. Mousa AY, AbuRahma AF, Bozzay J, et al. Long-term comparative outcomes of carotid artery stenting following previous carotid endarterectomy vs de novo lesions. *J Endovasc Ther*. 2015;22:449–456 [PubMed PMID: 25878023].
3. Kumamaru H, Jalbert JJ, Nguyen LL, et al. Surgeon case volume and 30-day mortality after carotid endarterectomy among contemporary medicare beneficiaries: before and after national coverage determination for carotid artery stenting. *Stroke*. 2015;46:1288–1294 [PubMed PMID: 25791713].
4. Trinidad-Hernández M, Introcaso JH, White JV. Combined open and endovascular treatment of a saccular aneurysm and redundant loop of the internal carotid artery. *J Vasc Surg*. 2006;44:642–646 [PMID: 16950447; PubMed – indexed for MEDLINE].