



Introduction

Vessel sacrifice is an uncommon but useful tool in the management of complex aneurysms, tumors, vessel dissections, and fistulas. The purpose of this study is to describe the use of a segmented coil containing an anchoring and filling segment within the same coil (Penumbra Occlusion Device (POD)) for carotid and vertebral artery sacrifice and to assess its feasibility, safety, and efficacy.

Methods

This is a retrospective chart review of patients managed with the POD. For the procedure, a balloon test occlusion was performed prior to permanent arterial sacrifice. Following this, a POD was deployed under roadmap technology with follow-up angiography. Secondary PODs or P400 coils were deployed as necessary. 9 patients underwent carotid/vertebral artery sacrifice using this technique from a period of 2014 to 2016.

Results

A total of 4 internal carotid arteries and 5 vertebral arteries were treated in 9 patients. The mean vessel diameter in 8/9 patients was 4.0 mm (range 2.9-7.7mm). The mean number of PODs used for vessel sacrifice was 2.5 (range 1-4). The mean number of additional coils used was 4 (range, 0-13). 8/9 (88 %) parent arteries were successfully occluded. One patient had slow flow distal to the occluded segment. There were no periprocedural complications including ischemic events, coil migrations, or vessel dissections. 5/9 patients had follow-up imaging and no patient developed a recurrence during the follow-up period mean 142 days (range 3-630 days).

Conclusions

Parent vessel sacrifice with a combination of PODs and P400 coils appears to be feasible, safe, and effective alternative to the traditional vessel sacrifice techniques.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Identify vessels that can be sacrificed with the POD 2) Discuss occlusion rates and complications associated with POD deployment.

References

1. Sorteberg A, Bakke SJ, Boysen M, Sorteberg W (2008) Angiographic balloon test occlusion and therapeutic sacrifice of major arteries to the brain. *Neurosurgery* 63(4):651-660
2. Lewis AI, Tomsick TA, Tew JM Jr (1995) Management of 100 consecutive direct carotid-cavernous fistulas: results of treatment with detachable balloons. *Neurosurgery* 36(2):239-244, discussion 244-235
3. Graves VB, Perl J 2nd, Strother CM, Wallace RC, Kesava PP, Masaryk TJ (1997) Endovascular occlusion of the carotid or vertebral artery with temporary proximal flow arrest and microcoils: clinical results. *AJNR Am J Neuroradiol* 18(7):1201- 1206
4. Barr JD, Lemley TJ (1999) Endovascular arterial occlusion accomplished using microcoils deployed with and without proximal flow arrest: results in 19 patients. *AJNR Am J Neuroradiol* 20(8):1452- 1456

Representative case

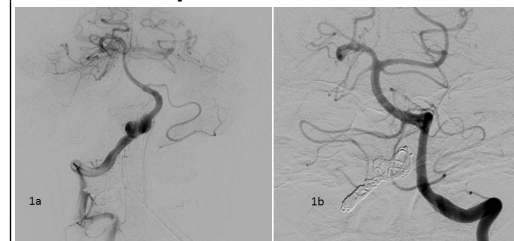


Figure Legend.
42 yo M with right V4 arterial fusiform aneurysm on right vertebral artery angiogram (1a) and subsequent left vertebral artery angiogram after embolization of dissecting aneurysm and vessel sacrifice (1b)

Figure Legend.

42 yo M with right V4 arterial fusiform aneurysm on right vertebral artery angiogram (1a) and subsequent left vertebral artery angiogram after embolization of dissecting aneurysm and vessel sacrifice (1b)