Pipeline Embolization Device for Tandem Intracranial Aneurysms: Largest Institutional Series

Tanmoy Kumar Maiti Mch; Devi Prasad Patra MD, M.CH, MRCS; Shyamal C Bir MD PhD; Hai Sun MD PhD; Anil Nanda MD FACS; Hugo Cuellar MD

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Introduction

Tandem intracranial aneurysms are adjacent aneurysms located along same parent vessel segment. They are mostly located on internal carotid artery, and often points towards an underlying diffuse anomaly. We describe the largest series of tandem aneurysms, treated by Pipeline Embolization Device (PED), a flow diverter.

Methods

We retrospectively reviewed records of patients, with these lesions who underwent endovascular treatment between April 2012 and November 2016. The antiplatelet regimen and procedural details have been discussed. The clinical outcome analyzed with modified Rankin score, and the angiographic occlusion rate was assessed with Simple Measurement of Aneurysm Residual after Treatment (the SMART scale)

Results

Fourteen consecutive patients with thirty-seven aneurysms have been included in this study. Three patients had tandem aneurysms bilaterally. The mean age of present cohort was 57.14 years (29-78 years). All the patients were female. All of them were unruptured. Most of the aneurysms were located in ophthalmic segment of ICA (45.9%) f/b cavernous segment of ICA (18.9%). Single PED was adequate for all except two patients. Adjunct coil embolization was preferred for seven aneurysms with more than 10 mm/ irregular aneurysms. On two occasions, patient had additional aneurysms, which were treated at the same time. Immediate stasis was noted for all of the patients except in two. Immediate occlusion was noted in four patients, all of them had adjunct coil embolization, at same sitting. 6 months FU angiogram was available for 65.3% patients. The occlusion rate was defined by SMART grading. Seventy five percent patients had complete occlusion (SMART 4) at 6 months follow-up, which improved in one year follow up. All patients except one had MRS 0-1 outcome. One patient with PED migration, had MRS 3 at 2 month follow-up.

Learning Objectives

1. Tandem aneurysms constitute an unique entity.
2. They are mostly located on internal carotid artery, and often points towards an underlying diffuse anomaly.
3. Microsurgical clipping, and wrapping are viable options.
4.Stent assisted coiling is generally practiced for these aneurysms. Pipeline embolization device for these aneurysms are another potential option with low morbidity and high occlusion rate.However, this has rarely been discussed in literature

References

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Conclusions

Tandem intracranial aneurysms can be safely treated with flow diverters, resulting in vessel reconstruction, and low risk of recurrence.

Figure 1 A

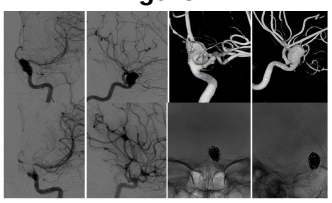

Figure 1A: Upper panel: Pre-op Left ICA injection; lower panel: immediate post embolization

Figure 1

Figure 1 B

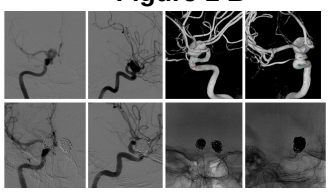

Figure 1B: Upper panel: Pre-op Right ICA injection; lower panel: immediate post embolization

Figure 2

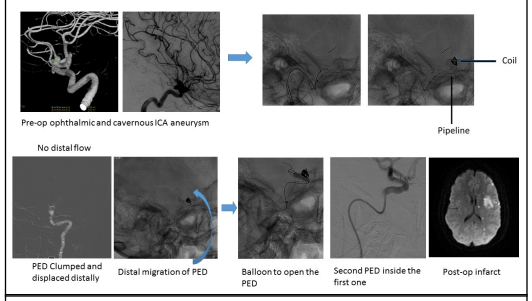

Figure 3A

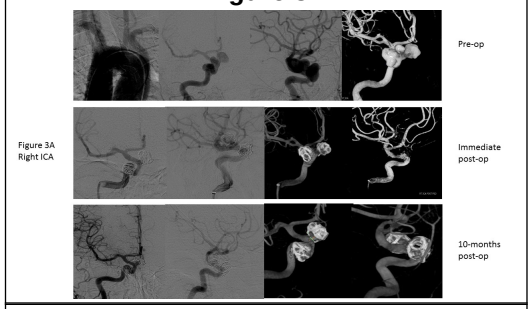

Figure 3B