



A retrospective study of Onyx complications in the treatment of arteriovenous malformations (AVM)

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Introduction

The treatment of arteriovenous malformation (AVM) with Onyx has been shown to be an effective treatment modality but outcomes and complications rates reported have been inconsistent. A meta-analysis of 103 studies with 1232 patients receiving Onyx found a complication rate of 6.8% (Elsenousi et al.) The true complication and risk of Onyx needs to be evaluated further

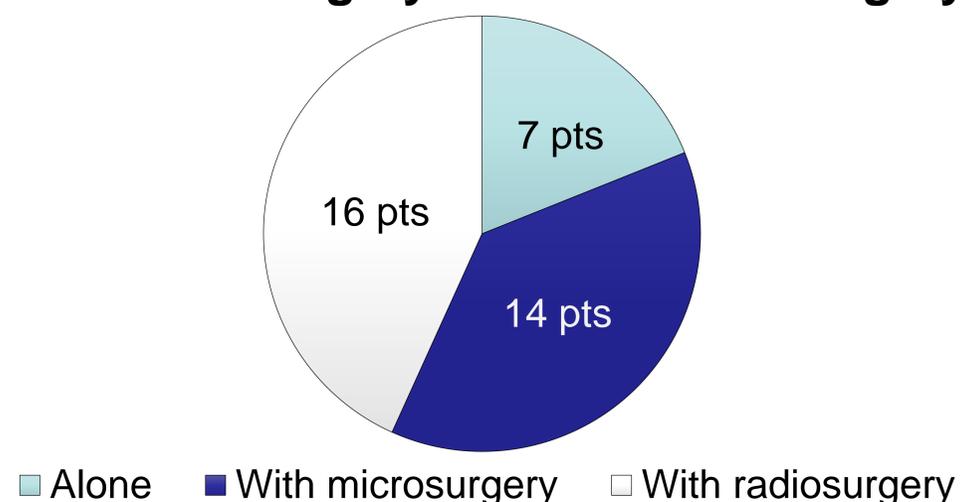
Methods

We performed a 10 year retrospective study at University of Texas Southwestern involving the treatment of AVMs with onyx as a primary or adjunct treatment. Excluded were patients that received onyx and another embolization material treatment. Complications were analyzed after embolization but before microsurgery or radiosurgery.

Age/Sex	Location	Size (cm)	Pre-onyx symptoms	Complication	Total sessions	Treatment
25M	Thalamus	6	Asymptomatic	Fine motor	4	O/R
30F	P. Frontal	3.5	Left-sided hemibody hypoesthesia	Stroke with right LE paresis	4	O/R
41F	Occipital	3	Asymptomatic	Quadrantanopia	1	O/S
22F	Thalamus	2.8	Hemorrhage left hemiparesis left inferior quadrantanopia	Worsening hemiparesis	1	O/R

O: Onyx, S: Surgery, R: Radiosurgery

Fig. 1: Patients treated with Onyx only, with microsurgery and with radiosurgery



Results

Eighty-seven AVM patients received embolization and of those there were 37 patients who received onyx only or as an adjunct treatment to microsurgery or radiosurgery. The treatment plans are 7 AVM patients with onyx only, 14 AVM patients with pre-embolization for radiosurgery, 16 AVM patients with pre-embolization for microsurgery (fig. 1).

One patient died shortly after embolization due to cerebellar hemorrhage that was present on admission and will be excluded from analysis below.

There are no complications in 28/36 patients (80%), vascular complications without clinical symptoms in 3/35 patients (8.3%), permanent neurologic deficits in 4 patients and temporary neurologic complaint in one patient (table 1). In the 36 patients, there were 57 embolization sessions with a permanent neurologic complication rate of 7% (4/57).

Conclusion

The permanent complication rate of onyx is 7% in our study, which is consistent with the body of literature. Onyx is an effective treatment modality and should be considered in the treatment of AVMs. Prospective studies are needed to elucidate the complications and management of AVMs with Onyx.

References

Elsenousi, A., Aletich, V. A., & Alaraj, A. (2014). Neurological outcomes and cure rates of embolization of brain arteriovenous malformations with n-butyl cyanoacrylate or Onyx: a meta-analysis. *Journal of neurointerventional surgery*, neurintsurg-2014.