

# Treatment of Bifurcation Aneurysms Using Single Stent-Coiling with Relation to Aneurysm Configuration: A Cohort Study of Two Academic Institutions in the United States



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## Introduction

Stent-assisted coiling of bifurcation aneurysms has expanded the spectrum of endovascular therapy. A variety of techniques have evolved to treat this group of aneurysms, most notably the two-stent Y- and X-configurations.

The safety and efficacy of single stent configurations in these aneurysms has not been fully evaluated.

In this study we report a large multicenter experience of stent-assisted coiling of bifurcation aneurysms using a single stent compared to Y-configuration stent-assisted coiling, with attention to factors predisposing to aneurysm recanalization.

## Methods

A multicenter retrospective analysis of bifurcation aneurysms treated with a single stent-assisted coiling or Y-configuration stent-assisted coiling techniques between 2007 and 2015 was performed.

Clinical and radiographic data were collected and used to develop a scoring system to predict aneurysm occlusion.

## Results

A total of 74 and 18 bifurcation aneurysms were treated with single stent and Y-configuration stent-assisted coiling.

The median length of follow-up was 15.2 months and 12.5 months for single stent and Y-stents, respectively. Complete occlusion or remnant neck upon last follow-up was achieved in 90.6% and 76.5% of aneurysms in single stent and Y-stents, respectively.

Aneurysm location, maximal diameter, neck size, and alpha angle were predictive of aneurysm occlusion at last follow-up following single stent-assisted coiling.

A scoring system to predict complete occlusion based on these 4 factors was developed. (Table 1) An increasing score correlated with a higher rate of complete occlusion. (Table 2)

**Table 1: Scoring system**

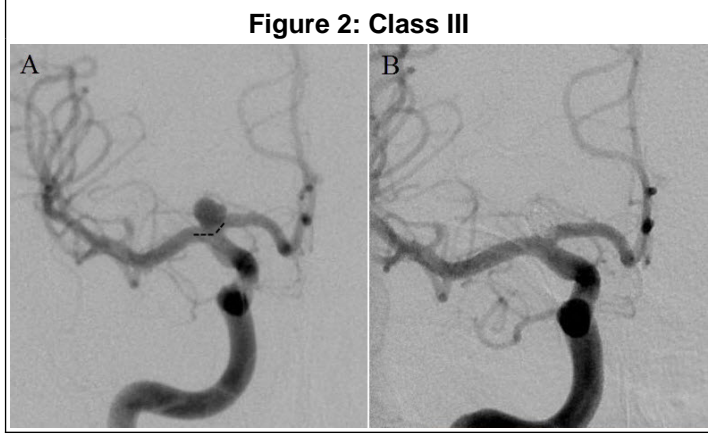
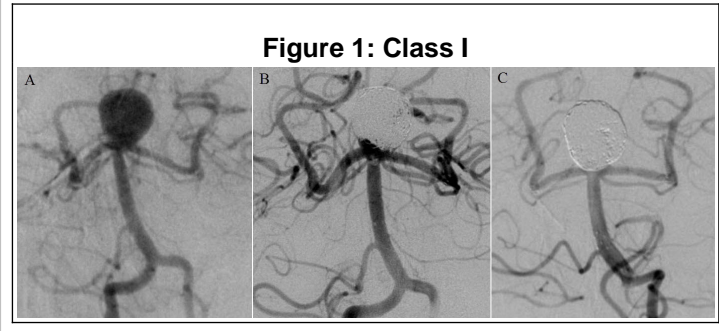
Factor	Score		OR	P value
	0	1		
Location	ICA and Basilar	MCA and Acom	7	0.004
Aneurysm maximal diameter	> 9.0 mm	≤ 9.0 mm	4	0.02
Aneurysm neck size	> 7.0 mm	≤ 7.0 mm	9	0.001
Alpha	> 165°	≤ 165°	4	0.026

**Table 2: Single vs double stent-coiling in treatment of different classes**

Class	Score	Single stent	Double stent	P value
I	0	14%	75%	0.04
II	1-2	55%	40%	0.56
III	3-4	92%	75%	0.19

Class III aneurysms could be effectively treated using single stent (Figure 1), while class I had significantly higher complete occlusion rate using Y-stents (Figure 2).

Class II yielded poor complete occlusion rate in either treatments, and an alternative option should be considered.



## Conclusions

The treatment of bifurcation aneurysm using single stent technique for stent-assisted coiling is safe and effective. Complete occlusion or remnant neck occlusion was achieved in 90.6% of cases.

We present a scoring system, which appears to predict the rate of aneurysm occlusion following single stent-assisted coiling based on 4 angioarchitectural features.

While our scoring system requires validation, we hope that it can be used to guide the management of bifurcation aneurysm.