

# Procedural Thromboembolic Risk in Stent-Mediated Coiling Of Sidewall Carotid Aneurysms is Stent-Type and Aneurysm Size Dependent

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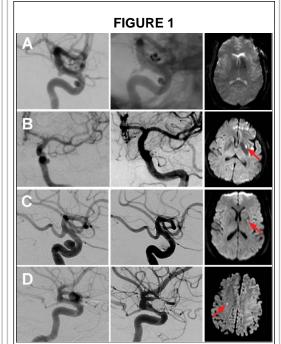
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## Introduction

Open- and closed-cell stents represent two principal options for stent-assisted coiling of internal carotid artery (ICA) aneurysms. This study seeks to compare clinical outcomes and procedural thromboembolic risk in treating sidewall ICA aneurysms with stent-assisted coiling (SAC) using these stent designs.

## **Methods**

122 consecutive patients (mean age, 56.8 years) receiving open-cell (n = 53) or closed-cell stents (n = 69) for SAC of sidewall ICA aneurysms underwent routine post-procedural magnetic resonance diffusion weighted imaging (MR-DWI) within 48 hours. Patient demographics, aneurysm location and size and, intraprocedural clotting function, presence and number of MR-DWI lesions (MR-DWI+), and peri-procedural complications were analyzed.



Preembolization DSA (Left),
postembolization DSA (Center), and MRDWI (Right) of 4 patients with ICA
aneurysms. A) L cavernous ICA An(max
ht. 3.5 mm) open cell stent-coiled, no DWI
hits. B) L cavernous ICA An(max ht. 3 mm)
closed cell stent-coiled, ipsilateral basal
ganglia DWI hit. C) L cavernous ICA
An(max ht 8.7 mm) open cell stent-coiled,
ipsilateral putamen DWI hit. D) R
ophthalmic ICA An(max. ht 9 mm) closed
cell stent-coiled, ipsilateral frontal lacunar
DWI hit.

# FIGURE 2 Open-Cell Stent Closed-Cell Stent p = 0.82 39.4 36.4 SMALL Dome Height < 5mm ANEURYSM SIZE

Percentage of patients who incur new postprocedural diffusion weighted imaging (DWI) lesions by stent type and aneurysm height distribution.

### Results

Within the <5 mm aneurysm subset, no open-cell (0/31) patients demonstrated MR-DWI lesions, compared to 12/36 or 33.3% of patients in the closed-cell group, (P <0.01). Within the > 5 mm aneurysm subset, 8/22 or 36.4% of patients in the open-cell group demonstrated post-procedural MR-DWI lesions, compared to 13/33 or 39.4% of patients in the closed-cell group, (P=0.82). The rate of MR-DWI+ among patients with new neurologic deficits (7/10) was significantly higher than among those without deficits (26/108), (P<0.01). Among open-cell patients' post procedural deficits 1 out of 2 (50%) completely resolved by discharge compared to 3 out of 8 (37.5%) for closed-cell patients.

## **Conclusions**

The previously described lower rate of procedural thromboembolic lesions associated with open-cell stent design owing to superior vessel apposition is aneurysm size-dependent and is voided in larger aneurysms. Although the exact mechanism needs further research, it could be the result of complex hemodynamics and inflowoutflow interactions across stent struts in larger aneurysms. Our findings may help guide stent choice based on lesion size and provide procedural thromboembolic estimates when considering SAC versus flow-diverter therapy in sidewall carotid aneurysms.

**Key Words**: Aneurysm (An), stentassisted coiling (SAC), open-cell, closed-cell, digital subtraction angiography (DSA), diffusion-weighted imaging (DWI)