## White collar sign

The white-collar sign (WCS) is known as a thick neointimal tissue formation at the aneurysm neck after endovascular coil embolization of cerebral aneurysms, which may prevent aneurysm recanalization.

The WCS was defined as a radiolucent band at the aneurysm neck on the angiogram at 6 months after initial embolization. The radiological outcome was evaluated using MR angiography. RESULTS In 23 of 149 aneurysms (15.4%), a WCS appeared. The WCS-positive group had a significantly smaller neck size ( $3.3 \pm 0.8 \text{ mm vs} 4.2 \pm 1.1 \text{ mm}$ , p < 0.001) and smaller aneurysm size ( $4.3 \pm 0.9 \text{ mm vs} 6.0 \pm 2.1 \text{ mm}$ , p < 0.001) than the WCS-negative group. Multivariate analysis revealed that WCS appearance was associated with small neck size (OR 0.376, 95% CI 0.179-0.787; p = 0.009). In 106 of 149 aneurysms, the rate of complete occlusion was significantly higher in the WCS-positive group (18/18, 100%) than in the WCS-negative group (n = 54/88, 61.4%; p = 0.001) in the mean follow-up period of 31.0 ± 9.7 months (range 5-52 months). Neither major recanalization nor rupture of the aneurysm occurred in the WCS-positive group.

Appearance of the WCS was associated with complete occlusion and good clinical outcome after endovascular coil embolization. The WCS would help to determine the prognosis of cerebral aneurysms after endovascular treatment <sup>1)</sup>.

## 1)

Fukuda K, Higashi T, Okawa M, Iwaasa M, Yoshioka T, Inoue T. White-collar sign as a predictor of outcome after endovascular treatment for cerebral aneurysms. J Neurosurg. 2016 May 13:1-7. [Epub ahead of print] PubMed PMID: 27177179.

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