

Endovascular Treatment Outcomes of Vertebrobasilar Junction Aneurysms: Systematic Review and Meta-Analysis

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Background: Vertebrobasilar junction (VBJ) aneurysms represent a relatively rare and often anatomically complex subgroup of saccular aneurysms. This systematic review and meta-analysis aimed to assess the safety and efficacy of endovascular treatment (EVT) of VBJ aneurysms.

Methods: PubMed, Web of Science, Ovid Medline, Ovid Embase, and Scopus were searched from inception to 20 December 2022. We included primary studies assessing the long-term clinical and angiographic outcomes for VBJ aneurysms treated with endovascular techniques. We excluded surgically managed studies. All data were analyzed using R software version 4.2.1. We calculated pooled prevalence rates and their corresponding 95% confidence intervals (CI).

Results: In this meta-analysis, a total of 76 VBJ aneurysms from seven studies were included for quantitative analysis. The results showed that the rate of adequate occlusion (complete +near complete occlusion) was 94.1% (95% CI=76.71–98.71), and the rate of complete occlusion was 77.7% (95% CI=63.07–87.65). A modified Rankin Scale (mRS) score of 0–2 was achieved in 93.9% of patients (95% CI=67.65–99.14). The mortality rate was found to be 5.9% (95% CI=0.97–28.55), and the retreatment rate was 4.6% (95% CI=1.50–13.36). The overall ischemic complication rate was 4.7% (95% CI= 0.73–25.4), while the overall hemorrhagic complication rate was 4.6% (95% CI=1.5–13.36).

Conclusions: The treatment of VBJ aneurysms with EVT is effective in achieving curative treatment and is associated with good clinical outcomes and low mortality rates. These findings provide important insights into the clinical and angiographic outcomes and the complication rates of EVT for VBJ aneurysms.