

Clip remodeling

Zhu et al. discussed the value and technique of [clip remodeling](#) in microsurgical [treatment](#) of [intracranial aneurysms](#) via [keyhole approaches](#).

The clinical [data](#) of patients with intracranial aneurysms, who were treated by microsurgical [clipping](#) via keyhole approaches from January 2017 to December 2019, were [retrospectively](#) analyzed. The [clips](#) were remodeled based on the aneurysmal characteristics during the [procedure](#) in 27 cases. [Angiography](#) was obtained within one week after surgery in order to evaluate the position of clips and the security of lesions. All patients were followed up at the [outpatient](#) clinic to assess the clinical [outcomes](#).

A total of 27 patients harbored 30 [intracranial aneurysms](#), including 23 ruptured lesions and 7 [unruptured](#) ones. There were 9 [middle cerebral artery aneurysms](#), 11 [anterior communicating artery aneurysms](#), 9 [posterior communicating artery aneurysms](#), and 1 [anterior cerebral artery aneurysm](#), respectively. Nine patients were operated via a [supraorbital keyhole approach](#), as well as 17 via [Mini-Pterional Craniotomy](#) and one via [interhemispheric](#) keyhole approach. Postoperative angiography revealed complete obliteration of lesions without residual filling in all cases. Twenty-five patients recovered well at discharge and two presented with mild disability. After 3-36 months of follow-up, no rebleeding and new-onset neurological deficits were noted.

Clip remodeling technique is a simple and effective option, which can alleviate the limitation of manipulative freedom under keyhole approaches and improve the microsurgical effect of [intracranial aneurysm clipping](#) ¹⁾.

¹⁾

Zhu Q, Chen AL, Dai CG, Cao DD, Wu T, Wu Y, Lan Q. [Application of clip remodeling technique in microsurgical treatment of intracranial aneurysms via keyhole approaches]. Zhonghua Yi Xue Za Zhi. 2021 Jan 12;101(2):152-156. Chinese. doi: 10.3760/cma.j.cn112137-20200416-01211. PMID: 33455133.

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