

Anterior Inferior Cerebellar Artery Clipping Via Anterior Petrosectomy: An Anatomical Study for Assessment of Optimal Vascular Control

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Introduction

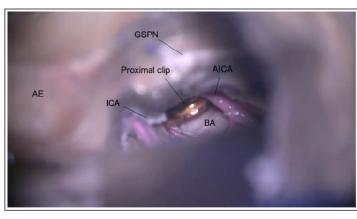
The microsurgical treatment of anterior inferior cerebellar artery (AICA) aneurysms is challenging due to a deep, narrow surgical corridor for effective proximal control of AICA and its relation to critical neurovascular structures. A variety of surgical approaches have been described to access the proximal AICA with an insufficient objective data on exposure or control of the regional vascular anatomy. This study was aimed to surgically simulate the feasibility of AICA exposure and vascular control using an anterior petrosectomy approach (APA).

Methods

A conventional APA was performed in ten injected specimens. The length of the total exposed AICA was measured, and the distance from its origin to the first pontine perforator and to the vertebral artery (VA) junction was recorded. The length from AICA origin to the most proximal and distal visible point of the basilar artery (BA)/ ipsilateral VA was measured. A temporary clip was applied in the most distal and proximal visible point of BA/ ipsilateral VA and their distance from the AICA origin was measured.

Results

Optimal exposure of the AICA and BA was achieved, in each specimen. The AICA mean length was 46.9 ± 14.3 mm and the distance from its origin to the first perforator was 9.3 ± 1.5 mm and to the VA junction was 11.6 ± 4.8 mm. The length of exposure of BA-AICA origin was 6.4 ± 4.0 mm distally and 18.4 ± 5.4 mm proximally. The distance from AICA origin to the clippable segment of BA was 4.7 ± 3.5 distally and 16.4 ± 4.6 mm proximally.

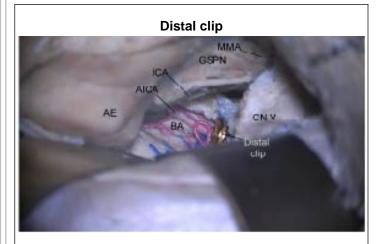


Conclusions

This study demonstrates that an optimal proximal control is achievable with an anterior petrosectomy for treating AICA aneurysm. We observed that this surgical exposure was adequate for visualization and safe clipping of proximal AICA (i.e. origin, premeatal, meatal segments). This objective data will aid in preoperative patient selection for proximal AICA aneurysm clipping through an APA.

Learning Objectives

- 1. Surgical anatomy of the anterolateral pontine vascular structures
- 2. Morphometric characteristics of the proximal anterior inferior cerebellar artery
- 3. Feasibility of performing clipping of AICA with distal and proximal control via an anterior petrosectomy



AE: arcuate eminance; AICA: antero-inferior cerebellar artery; BA: basilar artery; CN V: trigeminal cranial nerve; GSPN: great superficial petrosal nerve; ICA internal carotid artery; MMA: middle meningeal artery

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