Anatomical Comparative Assessment of Orbitozygomatic and Subtemporal Approaches to the Basilar Apex

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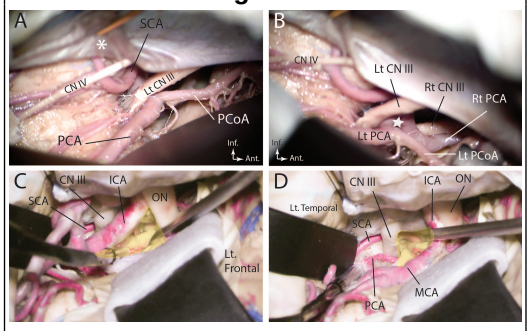
Introduction

The subtemporal and orbitozygomatic approaches are commonly used for treatment of basilar artery apex (BAX) aneurysms. Surgeons' experience and patient outcomes have been the main basis of publications addressing relative advantages and disadvantages of these approaches. The purpose of this study was to compare the subtemporal and orbitozygomatic approaches using surgically relevant parameters based on cadaveric dissection analysis for treatment of BAX aneurysms.

Methods

Subtemporal and orbitozygomatic approaches were performed on 5 cadaveric heads (10 sides). The following variables were compared between the 2 approaches: (1) perforator counts on P1-posterior cerebral arteries (PCA), (2) lengths of exposure and clipping for bilateral PCAs, superior cerebellar arteries (SCA), and basilar trunk, (3) surgical area of exposure, and (4) surgical freedom at the BAX.

Figure 1.

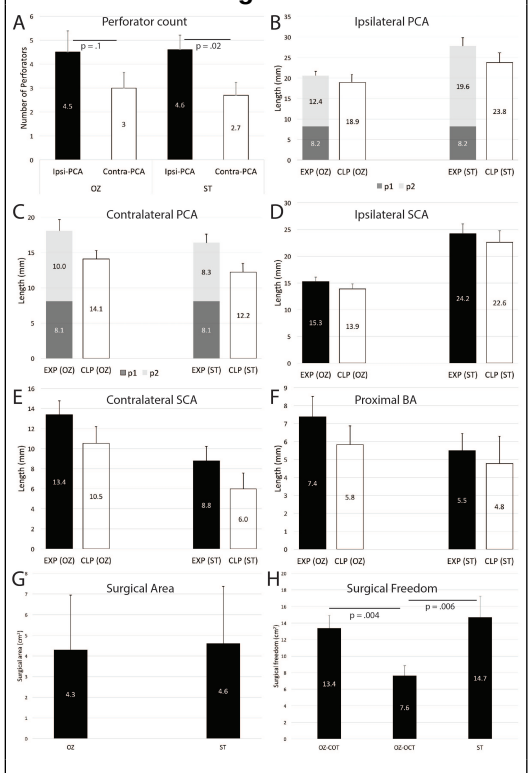


Exposure of the BAX via subtemporal (A-B), and orbitozygomatic (C-D) appraoches.

Results

No statistically significant difference was found between the number of perforators exposed on the ipsilateral P1-PCA using the two approaches. Exposure and clipping of ipsilateral SCA and PCA was superior using the subtemporal approach, and better for contralateral SCA and PCA using the orbitozygomatic approach. The exposure length of proximal basilar trunk was greater with the orbitozygomatic approach (7.4mm versus 5.5mm; P = .003). While the surgical area of exposure was not significantly different between the two approaches (P = .33), the total surgical freedom was greater in orbitozygomatic approach.

Figure 2



Detailed comparison between subtemporal and orbitozygomatic approaches regarding perforator count (A), Exposure and clipping length (B-F), surgical area (G), and surgical exposure (H)

Conclusions

The orbitozygomatic approach provides a greater number of surgical corridors to the BAX and is superior regarding several surgically relevant anatomic parameters. Importantly, control over the basilar trunk, and over the contralateral SCA and PCA (blind spots in BAX aneurysm surgery) is superior with the orbitozygomatic approach.

Learning Objectives

(1)Understating the main corridors to the basilar apex during orbitozygomatic and subtemporal approaches

(2)Defining the main differences between the two approaches regarding different surgically relevant anatomic variables

(3)Discussing the relative anatomical advantages and disadvantages of each approach for treatment of basilar apex aneurysms.

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