

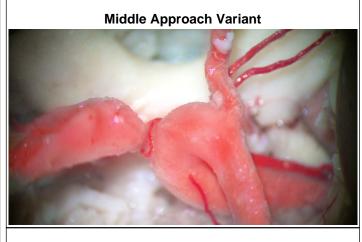
Three-dimensional Anatomical Analysis of Surgical Landmarks for the Anterior Interhemispheric Approach Bernardo Barbosa; Ricardo Marques Lopes Araujo; Catello Costagliola; Maleeha Ahmad MD, BM, MRCS, FRCS; Philip E. Stieg MD, PhD; Alexander I Evins MD; Antonio Bernardo MD



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Introduction

A variety of surgical approaches have been described for the treatment of anterior communicating artery (ACoA) aneurysms but there remains controversy as to the best mode of surgical treatment. The anterior interhemispheric approach is preferred for high-riding ACoA complex aneurysms as it allows for the visualization and exposure of the aneurysm with reduced cortical retraction and reduced dissection. We describe the three-dimensional endoscopic anatomy and surgical landmarks for the anterior interhemispheric approach for the management of AcoA aneurysms. Additionally, we evaluate the surgical exposure of the anatomical structures as seen through a variety of inclinations (anterior, middle, and posterior) of the approach along the sagittal sinus in order to identify the optimal surgical trajectory.



Middle Approach Variant



Posterior Approach Variant





Results

Our study provided a three-dimensional view of the surgical anatomy of the anterior communicating artery as seen through an anterior interhemispheric perspective and a detailed analysis of the anatomical exposure provided by the anterior, middle, and posterior approach variants. The 3D endoscope helped in identifying surgical landmarks to facilitate proper dissection and helped minimize brain retraction.

Methods

The anterior interhemispheric approach and its variations were performed on 5 cadaveric heads (10 sides) injected with colored latex. A scoring system was used to assess surgical exposure of the ACoA and the associated anatomy from different surgical perspectives. Each surgical area was explored by multiple surgeons using both microsurgical and endoscopic approaches.

Anterior Approach Variant



Conclusions

Our study confirmed that the anterior interhemispheric approach is still the optimal option for large and anteriorly extending aneurysms that protrude beyond the tuberculum sellae. Understanding the 3D relationships among the microsurgical structures, as well as the use of the 3D endoscope, may help reduce the risk of surgical complications.