

The Sigmoid Sinus as Seen Through Different Surgical Windows: An Extensive Anatomosurgical Study Melina Castiglione; Alexander I Evins MD; Maria B Vega; Philip E. Stieg MD, PhD; Antonio Bernardo MD Department of Neurological Surgery, Weill Cornell Medical College



Introduction

The sigmoid sinus is frequently exposed and/or traversed in a number of approaches in skull base surgery. When performing approaches to the lateral and posterolateral skull base, it is essential to understand the normal topographic anatomy of the sigmoid sinus and its exposure from different intraoperative perspectives. We describe the anatomy of the sigmoid sinus and the optimal degrees of exposure, skeletonization, and displacement or ligation to enhance exposure in different neurosurgical approaches.

The Sigmoid Sinus and the Temporal Bone



Methods

Posterior petrosectomies (translabyrinthine, retrolabyrinthine, transcochlear), a retrosigmoid, an extreme lateral, a petrooccipital transsigmoid, and a combined pre- and retrosigmoid approaches were performed on 6 adult cadaveric heads (12 sides). The sigmoid sinus, from the sigmoid-transverse junction to the jugular bulb, was divded into 3 segments: superior (from the superior petrosal sinus to the endolymphatic sac), middle (along the endolymphatic sac), and inferior (from the endolymphatic sac to the jugular bulb). The optimal degrees of sigmoid sinus exposure, skeletonization and manipulation, and displacement or ligation to enhance exposure in each approach were assessed. Strategies for avoiding complications from injury to the sigmoid sinus when accessing deeper targets were also examined.



Skeletonization and mobilization of the superior segment of the sigmoid sinus is beneficial in the superior retrosigmoid approach — as in cases of microvascular decompression — compared to all 3 segments in the retrolabyrinthine and combined pre- and retrosgimoid approaches, and the inferior segment in the extreme lateral approach. When performing the transigmoid approach, the superior and middle segments are skeletonized prior to ligation.



Conclusion

Thorough knowledge of the anatomy of the sigmoid sinus and its intraoperative management can help surgeons achieve enhanced exposure of the surgical target while avoiding iatrogenic injury and effectively navigating the region surrounding the sigmoid sinus.



Results

The retrosigmoid, far lateral, and extreme lateral approaches require exposure of only the posterior and posteroinferior sigmoid sinus. Partial skeletonization of the sigmoid sinus is satisfactory in all approaches except in the pre- and retrosigmoid approaches where complete skeletonization of the sinus is beneficial.