Quantitative Analysis of Endoscopic Endonasal Approaches to the Infratemporal Fossa.

Prosser JD1, Figueroa R2, Carrau RL3, Ong YK4, and Solares CA1

Medical of Georgia Department of Otolaryngology1, Medical College of Georgia Department of Radiology2, Saint John's Health Center Department of Otolaryngology3, Singapore General Hospital Department of Otolaryngology4

ABSTRACT

Objectives: The operative management of infratemporal skull base lesions is challenging. Expanded endonasal approaches to this area can decrease surgical morbidity. Access lateral to the natural nasal corridor can be achieved via a middle meatal antrostomy or a medial maxillectomy complemented by a septotomy or anteromedial maxillotomy (i.e. Denker's approach). We sought to compare the access to the infratemporal fossa offered by these endoscopic endonasal approaches.

Study Design. Software-enabled CT scan measurements.

Methods. Axial CT scans obtained with sub-millimeter cuts through the skull base were examined. All calculations were performed on axial images obtained at the level of the sphenoid floor using Kodak Carestream Image Software (Rochester, NY) measuring tools.

Results. Fifty sides were analyzed. The addition of a medial maxillotomy to a modified Denker's approach increased the exposure on average by 18.5 degrees (SD 4.28), when compared to a unilateral Denker's approach. When we augmented the access with an ipsilateral Denker's approach, an additional 33.5 degrees (SD 4.81) of exposure were obtained (p < 0.0001). The addition of an anteromedial maxillotomy to a medial maxillotomy provided an average increase in exposure of 47.5 degrees (SD 5.88) in comparison with a Denker's approach (p < 0.0001). The addition of an ipsilateral trans-septal approach provided a median increase in exposure of 30 degrees (SD 5.88) (p < 0.0001).

Conclusions. This radioanatomic study provides objective support for the use of an ipsilateral Denker's approach to augment an endoscopic endonasal approach to the infratemporal fossa.

Level of Evidence: 2c

INTRODUCTION

The infratemporal fossa can be involved by several lesions, benign or malignant, either primarily or by contiguous spread. The anteromedial maxillary wall (AMW) is the lateral point of the posterior maxillary wall (LPW) was then drawn (NAP-LPW line) (Figure 3). The amount of anterior medial maxillary wall that needed to be resected in order to provide the degree of exposure was then measured.

Contralateral trans-septal approach calculuations.

The NAP on the contralateral side was identified and a line was then drawn from this point traversing the septum at a level that would provide an extent of exposure of the lateral maxillary sinus wall similar to that of a 1 cm Denker's approach. The distance from the anterior aspect of the AMW line, the septotomy was required at an average of 1.56 cm (SD 0.49) posterior to the AMW line range (0.72 - 2.5 cm). Furthermore, 44% of the subjects would require an anterior septotomy that was less than 1.5 cm from the anterior aspect of the AMW line. To access the entire postero-lateral maxillary wall with a contralateral trans-septal approach a septotomy was required at an average of 1.52cm (SD 0.39, Figure 4) from the anterior aspect of the AMW line.

RESULTS

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CONCLUSIONS

The use of an ipsilateral Denker's approach provides excellent access to the infratemporal fossa without the need for a septotomy. This radioanatomic study provides objective support for its use.

REFERENCES