Hearing Preservation Using the Middle Fossa Approach for the Removal of Vestibular Schwannomas

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ABSTRACT

INTRODUCTION

Demographics

Fourty-five patients underwent a middle fossa approach for removal of a vestibular schwannoma. There were 30 female and 16 male patients. The mean age was 49.3 years (range 30.5 to 65.4 years). Mean follow-up was 1.8 years.

METHODS AND MATERIALS

Results

Facial nerve outcomes

Complications

Surgical technique

Continuous seventh nerve monitoring and intraoperative ABR were used in all cases, a standard middle fossa approach was performed identifying Bill’s bar and removing the tumor from a medial to lateral direction. The IAC defect was closed using either muscle or fat. A neurotologist and neurosurgeon were involved in all cases.

Facial nerve outcomes

Preoperative and postoperative facial nerve outcomes were obtained by an attending neurotologist using the House-Brackmann (HB) grading scale. Patients demonstrating any degree of synkinesis were not scored better than grade III. All patients received intraoperative steroids. There was a trend for increased PTA in tumors less than 6 mm, but this did not reach significance. (p=0.13) Figure 3 shows the postoperative hearing thresholds in the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) recommendations for reporting hearing outcome. Of the 38 patients who had class A or B hearing preoperatively, 27 (71.1%) retained class A or B hearing. There were 15 patients who had grade VII facial function at last follow-up.

Hearing preservation is higher in tumors 1 cm or less with 77.7% of patients in this study maintaining class A or B hearing. Facial nerve function was maintained in 95% of patients. Postoperative facial nerve function was statistically better than the preoperative HB grade in 25% of patients. The three patients that had a HB grade VI in the postoperative period had HB grade III facial function at last follow-up. Tumor size did not affect facial nerve outcome in our series.

CONCLUSIONS

The middle fossa approach for the removal of a vestibular schwannoma has a high rate of hearing preservation with relatively low risk of morbidity. Hearing preservation is higher in tumors 1 cm or less with 77.7% of patients in this study maintaining class A or B hearing. Facial nerve results are good with all patients having at least grade III HB facial function at last follow-up.

SELECTED REFERENCES


DISCUSSION

Hearing preservation for tumors removed by the middle fossa approach have been reported between 50% to 80%. Our hearing results compare favorably with previous studies with 14.3% to 63% hearing preservation rate defined as having a postoperative class A or B hearing. Hearing preservation rates for tumors greater than or equal to 10 mm have been 30% to 50% with 77.7% of the tumor having been in multiple studies in reports of hearing preservation. Several factors including hearing status, age, tumor location and size, and patient preference are potential for at least short-term hearing preservation, long-term follow-up is still needed. Factors such as the radiation dose to the cochlea, tumor volume, and tumor location affect hearing preservation. The middle fossa approach has been the preferred surgical approach at many centers and has the advantage of tumor removal with a high rate of hearing preservation. We are reporting our results using the middle fossa approach for the removal of a vestibular schwannoma.

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