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ORIGINAL ARTICLE

Surgical Treatment of Vestibular Schwannoma. Review of 420 Cases☆

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KEYWORDS
Vestibular schwannoma;
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Abstract
Introduction and objectives: Vestibular schwannoma is the most frequent cerebellopontine angle tumour. The aim of our study is to reflect our experience in the surgical treatment of this tumour.
Material and methods: Retrospective study of 420 vestibular schwannomas operated in our hospital between 1994 and 2014. We include tumour size, preoperative hearing, surgical approaches, definitive facial and hearing functional results, and complications due to surgery.
Results: A total of 417 patients with 420 tumours were analysed, 209 female (50.1%) and 208 male (49.9%). Mean age at diagnosis was 49.8±13.2 years. The majority of the tumours were resected through a translabyrinthine approach (80.2%). Total tumour removal was achieved in 411 tumours (98.3%), and anatomic preservation of facial nerve in 404 (96.2%). Definitive facial nerve outcome was House–Brackmann grade I and II in 69.9%, and was significantly better in tumours under 20 mm. Surgical complications included cerebrospinal fluid leakage in 3 patients (0.7%) and retroauricular subcutaneous collection in 16 (3.8%), 5 cases of meningitis (1.2%), 4 patients with intracraneal bleeding (0.9%), and death in 3 patients (0.7%).
Conclusions: Surgery is the treatment of choice for vestibular schwannoma in the majority of patients. In our experience, the complication rate is very low and tumour size is the main factor influencing postoperative facial nerve function.

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PALABRAS CLAVE
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Complicaciones

Tratamiento quirúrgico del schwannoma vestibular. Revisión de 420 casos

Resumen
Introducción y objetivos: El schwannoma vestibular es el tumour más frecuente en el ángulo ponto-cerebeloso. El objetivo de nuestro estudio es reflejar nuestra experiencia en el tratamiento quirúrgico de este tumour.
Material y métodos: Estudio retrospectivo de 420 schwannomas vestibulares intervenidos en nuestro centro entre 1994-2014. Se incluyen el tamaño tumoral, la audición preoperatoria, los abordajes quirúrgicos utilizados, el resultado definitivo de la función facial y auditiva y las complicaciones derivadas de la cirugía.
Resultados: Un total de 417 pacientes con 420 tumores fueron analizados, siendo 209 mujeres (50,1%) y 208 varones (49,9%). La edad media fue de 49,8±13,2 años. La mayoría de los tumores se resecaron mediante abordaje translaberíntico (80,2%). La resección tumoral completa tuvo lugar en 411 tumores (98,3%), y la conservación de la integridad anatómica del nervio facial en 404 (96,2%). El resultado definitivo del facial fue grado I y II de House-Brackmann en el 69,9%, siendo significativamente mejor en los tumores de menos de 20 mm. Entre las complicaciones se incluyen 3 casos de fístula (0,7%) y 16 acúmulos retroauriculares de líquido cefalorraquídeo (3,8%), 5 de meningitis (1,2%), 4 sangrados intracraneales (0,9%) y exitus en 3 pacientes (0,7%).
Conclusiones: El tratamiento quirúrgico del schwannoma vestibular sigue siendo el de elección en la mayoría de los casos. En nuestra experiencia, la tasa de complicaciones es baja, siendo el tamaño tumoral el principal factor influyente en la función facial postoperatoria.

Introduction

Vestibular schwannoma (VS), often called acoustic neuroma, is the most common cerebellopontineangle (CPA) tumour, representing up to 75% of skull base tumours.[1] There are several different management approaches to this type of tumour, including radiotherapy, observation and periodic control of the tumours, and of course surgery. Since these tumours are slow growing and of indolent course they may be periodically monitored with wait and scan nuclear magnetic resonance (NMR) imaging and with assessment of growth. This option may be suitable under certain circumstances, such as patients of advanced age, in poor general health, with small tumours, few symptoms or with relatively well preserved hearing.[2] However, when these tumours are larger, they may seriously compromise the patient's life, or be the cause of major neurological sequelae. Surgical treatment therefore continues to be the treatment of choice in those tumours where maximum diameter is over 20 mm, the tumour seriously compresses the brain stem or causes vestibular symptoms which affect the patient's well being. Since VS surgery began at the end of the 19th Century, when there were countless obstacles and tragic events, with a mortality rate reaching 80%,[3] results have been increasingly better due to the refinement of surgical techniques, the improvement of anaesthetics, the monitoring of cranial nerves, and naturally the accumulated experience of surgeons. The goal of surgery is to successfully remove the tumour completely, with the possible anatomical preservation of the facial nerve and in several cases, hearing.

The aim of this study is to reflect our experience in the surgical treatment of VS, analyse the functional outcome obtained and determine the factors associated with poor postoperative facial function and potential complications of surgery.

Material and Methods

We conducted a retrospective study of VS diagnosed or referred to our hospital between January 1994 and September 2014. Out of a total of 516 tumours, we decided to periodically monitor 96 of them (18.6%), whilst the majority, 420 (81.4%), opted for surgical treatment.

Initial NMRI and CT bony labyrinth imaging studies were performed. Follow-up after surgery was carried out after one month, 6 months, 12 months and then once a year.

Surgical Approaches

Once the patient had been informed about the different treatment possibilities and the decision to have surgery had been taken, the factors analysed for deciding which surgical approach to take were as follows: tumour size, spread of the tumour in the internal auditory (IAC), radiological anatomy, preoperative hearing level in both ears and personal preference of surgeon. Table 1 shows our therapeutic formula.

Our preference in the majority of cases was for a wide translabyrinthine approach (WTLB). This is an extensive approach which does not require cerebral or cerebellar compression and offers full control of the CPA with fairly constant anatomical references, with exposure of the length of the IAC, and better control of the facial nerve. We always use this approach when the tumour larger than 1.5 cm EC,