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Gamma Knife Radiosurgery as primary treatment for large vestibular schwannomas: clinical results at long-term follow-up in a series of 59 patients

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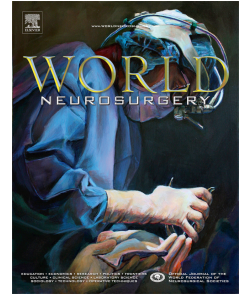
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**ABSTRACT**

**Background.** Gamma Knife Radiosurgery (GKRS) represents a well-accepted treatment for small-medium vestibular schwannomas (VS), however, its application in larger VS is still controversial.

**Methods.** Among the 523 patients treated at our Institution for VS between 2001 and 2010, we included 59 patients harboring a VS larger than 25 mm, treated by GKRS as primary treatment, not affected by NF2, and with a clinical follow-up (FU) of at least 36 months. Five patients underwent ventriculo-peritoneal shunt (VPS) placement before radiosurgery. Clinical FU (mean 79.4 months) was obtained in all patients. Patients' age ranged from 24 to 85 (mean 63.8 years). Mean tumor volume was 5.98 cc (max 14.3 cc) and median marginal dose was 13 Gy. A statistical analysis was performed to correlate clinical outcome with tumor radiological features, dose planning parameters and patients' characteristics.

**Results.** Tumor control was achieved in 98.3% of cases. At last follow-up 86.4% of VS showed volume reduction. Recorded complications were: 3 cases (5.1%) of new permanent facial nerve deficit, 4 cases (6.8%) of new or worsened trigeminal impairment and 10 new cases (18.5%) of hydrocephalus requiring VPS. Larger tumor size was significantly associated with a subsequent ventricular enlargement. Overall functional hearing preservation rate was 31.3% (66.7% among Gardner-Robertson I patients).

**Conclusion.** Surgical resection remains the primary approach for large VS with symptomatic brainstem compression. GKRS can be considered a safe and effective option in particular in patients who are not good candidates for surgery.

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