Effect of SRT and the natural history of vestibular schwannoma

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It is often reported that SRT (stereotactic radiotherapy) is effective if the irradiated tumor does not show the growth. However, the growth of vestibular schwannoma seems to be slow in many cases. We have been following up more than 100 untreated tumors over two or more years and in about half of the cases the growth rate is less than 1 mm/year according to our recent study. The CISS imaging with submillimeter resolution is used to measure the tumor size in the majority of the cases. Thus, even a tumor does not grow after SRT, the treatment cannot be accepted to be successful. The SRT can be judged successful when the tumor size is reduced, or the tumor growth is held in a case in which obvious tumor growth was confirmed before the treatment. Hearing before and after the treatment should be reported at the same time.
INTRODUCTION:
To evaluate an efficacy of fractionated stereotactic radiotherapy (fSRT) in patients with vestibular schwannoma.

MATERIALS AND METHODS:
A hundred eleven patients with vestibular schwannoma were treated with fSRT between 1991 and 2000 giving 44-50 Gy in 22-25 fractions over a period of 5-6 weeks. The median follow-up period was 28.5 (3-110) months, and 51 patients were followed-up over 24 months. The mean size of the tumors was 17.0 (range: 3-40) mm. Pure tone averages (PTA) was measured by averaging for five main frequencies (250-4000 Hz). Eighty-four patients (77%) had measurable hearing before SRT. Gardner and Robertson's classification was used to evaluate hearing class for the 81 patients. The hearing preservation after fSRT was defined as a patient kept class 1 or 2 hearing (serviceable hearing) at a final otological examination, and the class preservation was defined as no decrease in hearing class at each pretreatment level. The Kaplan-Meier method was used for calculation.

RESULT:
Some tumors showed a transient increase in tumor volume within one-year period after SRT, then involuted. Overall actuarial 5-year tumor control rate (no tumor growth greater than 2.0 mm after 2 years or no requirement of salvage resection surgery) was 92%. Actuarial 3-year tumor-reduction rate (reduction in tumor size greater than 2.0mm) was 93 %. The actuarial 5-year hearing preservation rate was 73.9%. The actuarial 5 - year class preservation rate was 56%. In 20 patients who were monitored over 5 years, no patients experienced further hearing deterioration. Neither permanent facial nor trigeminal neuropathy occurred during the observation period after fSRT. Although, transient facial nerve palsy, transient trigeminal neuropathy, or vertigo was observed in 2.5%, in 15.0%, and in 17.5%
of patients, respectively.

CONCLUSION:
Fractionated SRT provided an excellent tumor control rate and hearing preservation rate. Tumor volume has to be evaluated at least 2 years after fSRT and hearing has to be monitored at least 5 years. A proper method to evaluate the fSRT will be proposed.