OBJECTIVE: Neurofibromatosis type 2 (NF2) is an autosomal dominant disease characterized by bilateral vestibular schwannomas (VSs). NF2-associated VSs (NF2-VSs) are routinely treated with microsurgery; however, stereotactic radiosurgery (SRS) has emerged as an effective alternative in recent decades. To elucidate the role of SRS in NF2-VSs, a systematic review of the literature was conducted to compare outcomes of SRS versus surgery.

METHODS: PubMed, Web of Science, Scopus, Embase, and Cochrane databases were queried using relevant search terms. Retrospective studies investigating outcomes of NF2-VS patients treated with either SRS or surgery were included. Single-patient case reports were excluded. Outcome measures between the SRS and surgery groups were compared using $\chi^2$ 2-sample tests for equality of proportions on the pooled patient data.

RESULTS: A total of 974 patients (485 SRS, 489 surgery) were identified. The mean 5-year local control rate for SRS was 75.1%, and the mean recurrence rate for surgery was 8.1%. The mean hearing and facial nerve preservation rates were 40.1% and 92.3%, respectively, for SRS and 52.0% and 75.7%, respectively, for surgery. Rates of hearing preservation were higher after surgery than after SRS ($P = 0.006$), whereas rates of facial nerve preservation were higher after SRS than after surgery ($P < 0.001$).

CONCLUSIONS: SRS appears to be a safe and effective alternative to surgery for NF2-VS. Although rates of hearing preservation were higher in the surgery cohorts, SRS demonstrated high rates of local control and significantly lower facial nerve complications. Certain patients may therefore benefit more from SRS than surgery.

KEYWORDS: Hearing; Neurofibromatosis type 2; Stereotactic radiosurgery; Vestibular schwannoma

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