



Seven-Year Update of Multi-Center Prospective Study of Large Vestibular Schwannomas: Acoustic Neuroma Subtotal Resection Study (A.N.S.R.S)

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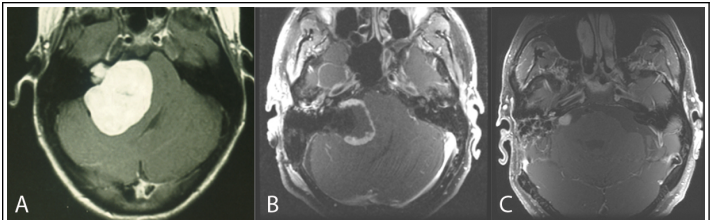


Introduction

Patients with large acoustic neuromas are at high risk of poor facial nerve (CNVII) function following surgery. Subtotal resection has the potential for better facial nerve outcome but higher tumor recurrence.

Methods

Patients with acoustic neuromas larger than 2.5 cm in cerebellopontine angle (CPA) underwent gross total (GTR), near total (NTR) with remnant tumor no larger than 0.5cm3 on postoperative MRI or 2x2x5mm residual in surgery, or subtotal (STR) resection defined as any larger remnant. Patients received stereotactic radiation if tumor remnant grew unless medically not indicated.



Example of sutotal resection (STR). Axial T1 post contrast MRI's preoperative (A), immediately postop (B), 3 months postop (C)

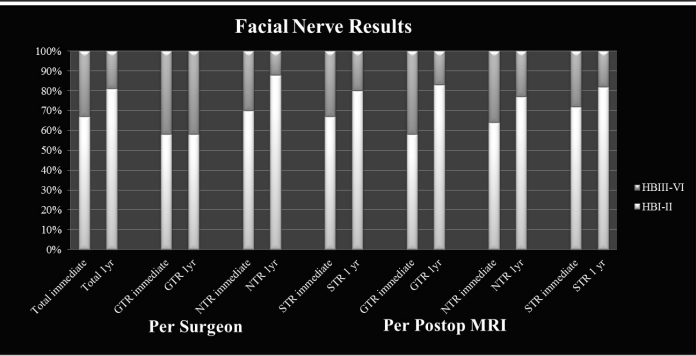
Results

Of 132 enrolled patients, 73 had at least 1-year follow up (mean 38 months). Average age was 48.7 years, mean tumor diameter was 3.33cm, and 34% were cystic. As defined by postoperative MRI 12 had GTR, 22 NTR, and 39 STR.

		Degree of resection on MRI			
		GTR	NTR	STR	Total
Degree of resection Surgeon	GTR	7	3	2	12
	NTR	3	13	8	24
	STR	0	4	26	30
	Total	10	20	36	

Correlation between the degree of resection defined by surgeon and postoperative MRI

There were 14(21%) recurrences, 1(8%) in GTR, 2(9%) in NTR, and 11(28%) in STR groups with average of 35 months to recurrence (4-74mo). The recurrences were treated with SRT in 11 cases, IMRT in 1 case, and surgery in 2 cases due to size and cystic nature of recurrence. Four of post-radiation remnants (33%) continued to grow and required surgical salvage. Tumor recurrence was related to longer followup, non-cystic tumor, larger residual tumor, and STR resection as defined by surgeon. Recurrence was three times as likely in STR (28.2%) compared to GTR and NTR (8.3% and 9.1%) groups as defined by MRI as well but did not achieve statistical significance.



Immediate and longterm facial nerve outcome as a function of degree of resection defined by surgeon and postoperative MRI

Good facial nerve function (House-Brackmann I and II) was achieved in 67% immediately and 81% at 1-year from surgery. Better immediate nerve function was associated with smaller preoperative tumor diameter (p=0.0024) and volume (p=0.016) as well as percentage of the tumor left behind. The predictors associated with late CNVII good function were degree of resection as defined by surgeon, and tumor size preoperatively but only at a trend level of significance (p=0.054 and 0.08 respectively). Patients who received GTR had the worst and NTR the best late facial nerve outcome (P=0.05).

Conclusions

Less-than-total resection of large acoustic neuromas allows for excellent facial nerve outcomes, however the rate of persistent growth is inversely proportional to the size of residual tumor. Growing tumor remnants may be treated effectively with stereotactic radiation, though about 1/3 of tumors may still require surgical salvage. The NTR group had slightly better CNVII outcome compared to GTR without increased risk of recurrence.