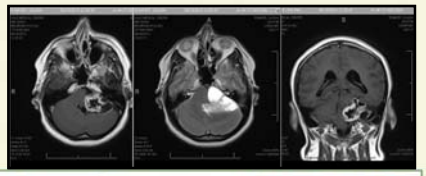
UAB Update on Acoustic Neuroma Surgery



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Knowledge that will change your world

Wink S Fisher III MD
Benjamin M McGrew MD

Skull Base Team

Benjamin M McGrew MD

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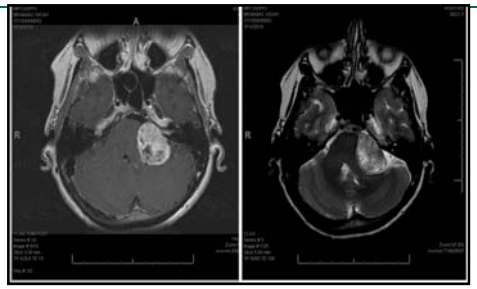

Why even discuss?

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Current practices in vestibular schwannoma management: A survey of American and Canadian neurosurgeons

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Survey Results

ABSTRACT

Objectives: Comprehensive therapy for vestibular schwannomas has changed dramatically over the past fifty years. Previously, neurosurgeons were most likely to treat these tumors via an independent surgical approach. Currently, many neurosurgeons treat vestibular schwannomas employing an interdisciplinary team approach with neuro-otologists and radiation oncologists. This survey aims to determine the current treatment paradigm for vestibular schwannomas among American and Canadian neurosurgeons, with particular attention to the utilization of a team approach to the surgical resection of these lesions.

Methods: A seventeen part survey questionnaire was sent by electronic mail to residency trained members of the American Association of Neurological Surgeons currently practicing in Canada or the United States. Questions were divided into groups regarding physician background, overall practice history, recent practice history, opinions on treatment paradigms, and experience with an interdisciplinary team approach.

Results: Seven hundred and six responses were received. The vast majority of neurosurgeons surgically resect vestibular schwannomas as part of an interdisciplinary team (85.7%). Regional variations were observed in the use of an interdisciplinary team: 52.3% of responding neurosurgeons who surgically treat vestibular schwannomas without neuro-otologists currently practice in the South (no other region represented more than 15.4% of this group, $p = 0.02$). Surgeons who have treated >50 vestibular schwannomas show a trend towards more frequent utilization of an interdisciplinary approach than less experienced surgeons, but this did not reach statistical significance.

Conclusions: The majority of neurosurgeons in the United States and Canada surgically resect vestibular schwannomas via an interdisciplinary approach with the participation of a neuro-otologist. Neurosurgeons in the South appear more likely to surgically treat these tumors alone than neurosurgeons in other regions of the U.S. and Canada.

Seen in One Calendar Year

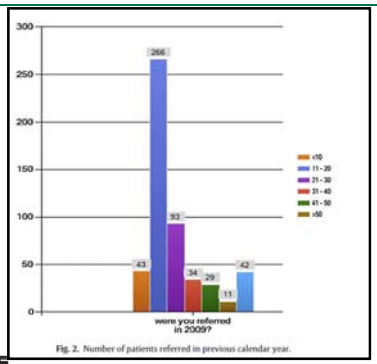
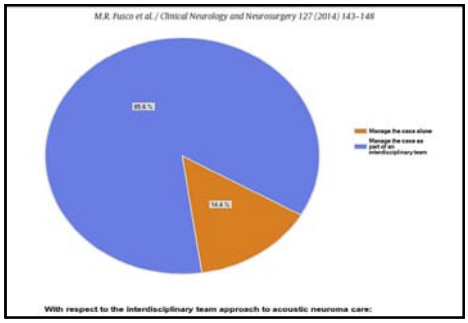


Fig. 2. Number of patients referred in previous calendar year.

Combo v Solo



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Treatment Options

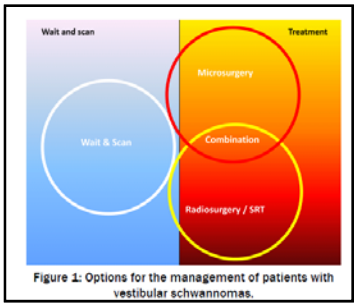

Figure 1: Options for the management of patients with vestibular schwannomas.

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SRNS

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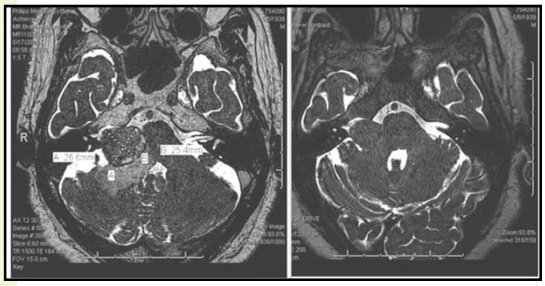
Older MD - Renal Failure and severe Vertigo



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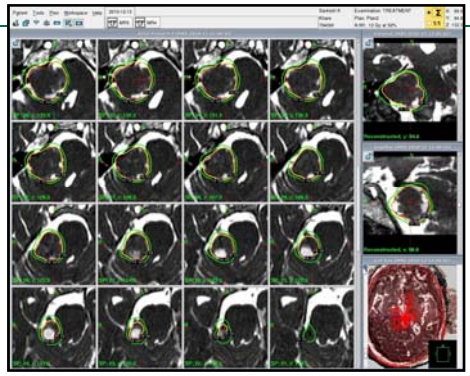

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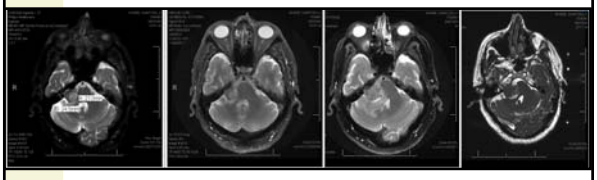

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Surgery

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Size – Koos v Samii

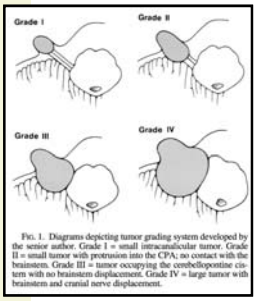

Fig. 1. Diagrams depicting tumor grading system developed by the senior author. Grade I = small intracanalicular tumor. Grade II = small tumor with protrusion into the CPA; no contact with the brainstem. Grade III = tumor occupying the cerebellopontine cistern with no brainstem displacement. Grade IV = large tumor with brainstem and cranial nerve displacement.

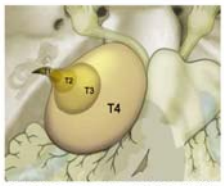

Figure 2: Tumor stages according to Samii [9, 20].
T1: intracanalicular; T2: intra-/extrameatal; T3: tumor reaches the brainstem; T4: tumor compresses the brainstem.

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House & Brackmann

Table 1: Grading of the facial nerve function, simplified according to House & Brackmann [105] mentioning the percentage of the deficit.

Grade	Description	Characteristics
I	Normal (100%)	Normal function
II	Light paresis (75–99%)	Symmetry at rest Eyelid closure with minimal effort, the angle of the mouth is minimally hanging
III	Moderate paresis (50–75%)	Symmetry at rest Eyelid closure with effort, the angle of the mouth is minimally hanging, light synkinesis
IV	Advanced paresis (25–50%)	Symmetry at rest Disfigurement during movement Frontal branch is immobilized Incomplete eyelid closure The angle of the mouth is asymmetric with maximum effort
V	Severe phase (0–25%)	Asymmetry at rest Immobile frontal branch Incomplete eye closure The angle of the mouth can be minimally moved
VI	Immobility (0%)	No movement

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Reliability of postoperative photographs in assessment of facial nerve function after vestibular schwannoma resection

Clinical article

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Division of Neurosurgery, Department of Surgery, University of Alabama at Birmingham, Alabama

Object. This study was undertaken to assess the reliability of observations of postoperative photographs in assigning House-Brackmann scores as outcome measures for patients following resection of vestibular schwannomas.

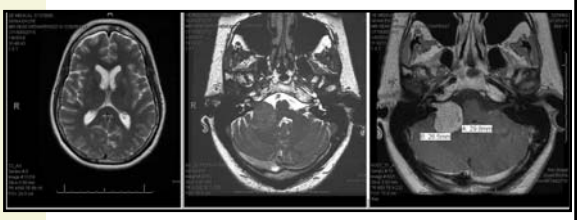
Methods. Forty pictures of differing facial expressions (typically elicited from patients for assigning House-Brackmann scores) were individually evaluated by neurosurgery residents and faculty members at the University of Alabama at Birmingham; a score was assigned to each picture by the individual raters. The interrater reliability was measured using the Spearman correlation coefficient, Kendall coefficient of concordance, and kappa statistic; internal consistency was calculated using the Cronbach alpha reliability estimate.

Results. The Spearman correlation coefficients showed strong positive association among raters, with a range of values of 0.66 to 0.90. Internal consistency measured by the Cronbach alpha coefficient was excellent ($\alpha \geq 0.97$). The Kendall coefficient of concordance for the ordinal grades suggested a substantial degree of agreement among the raters ($w = 0.78$, $p < 0.001$).

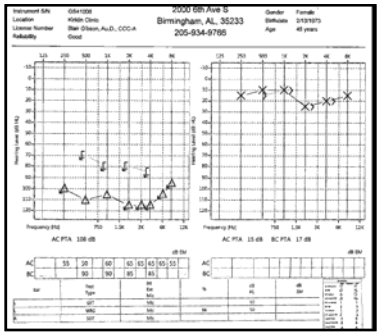
Conclusions. Static postoperative photographs are a reliable outcome measure for determining facial nerve function after vestibular schwannoma resection and may serve as a surrogate for the dynamic patient interview.

Key Words • reliability • vestibular schwannoma • facial nerve

First decision - Hearing



First decision - Hearing



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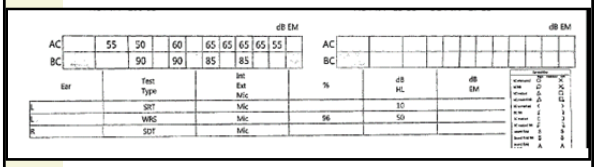
50-50 Rule



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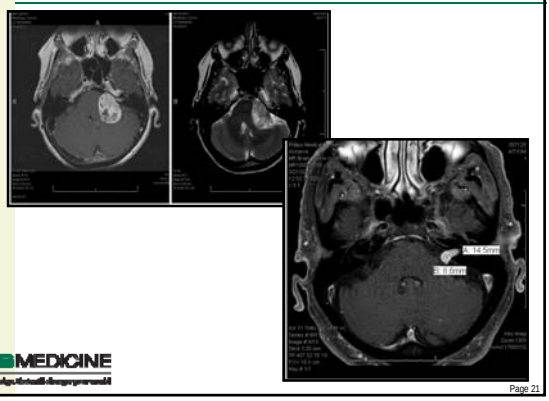
Second - Size



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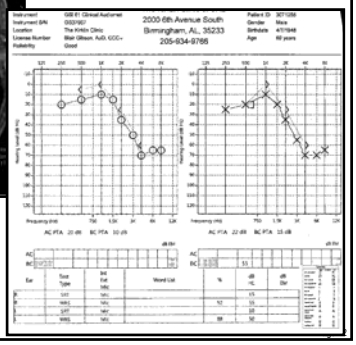
Serviceable Hearing



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Park Bench

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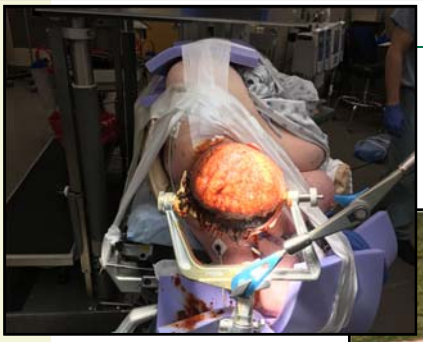
Park Bench



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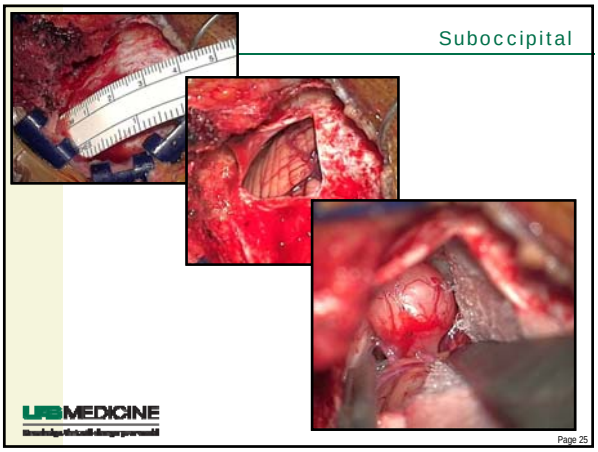
Suboccipital



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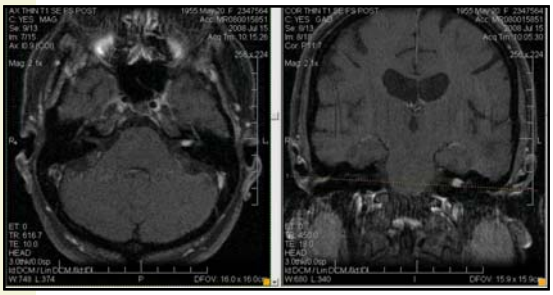
Serviceable Hearing Middle Temporal



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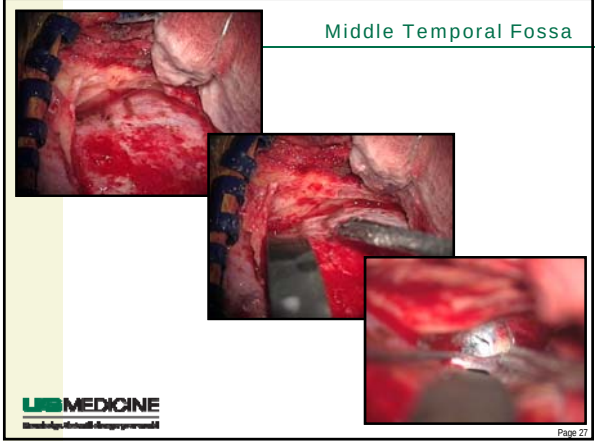
Middle Temporal Fossa



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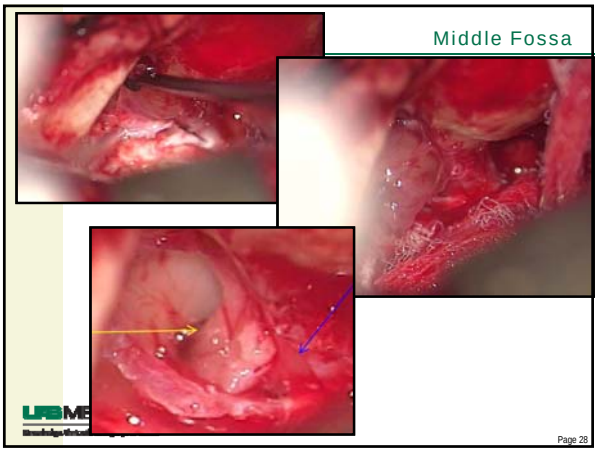
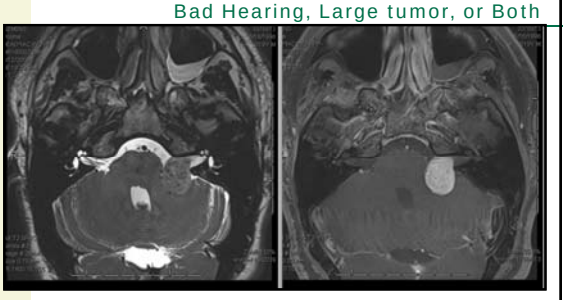
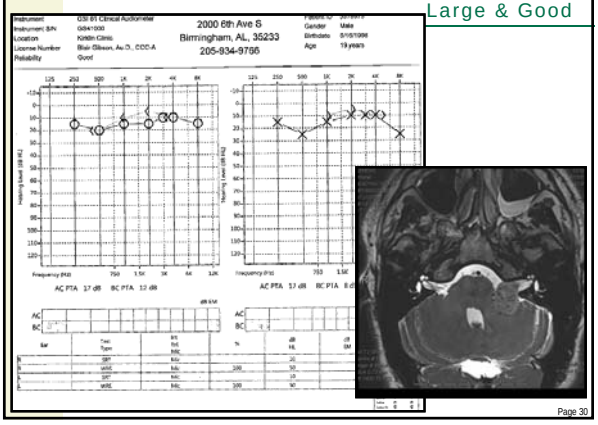
Middle Fossa



Bad Hearing, Large tumor, or Both



Large & Good



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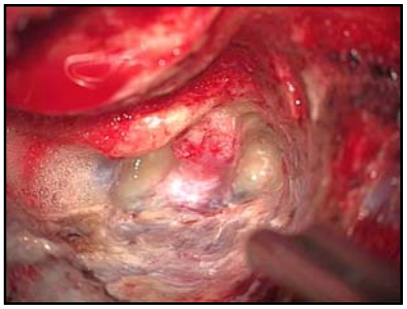

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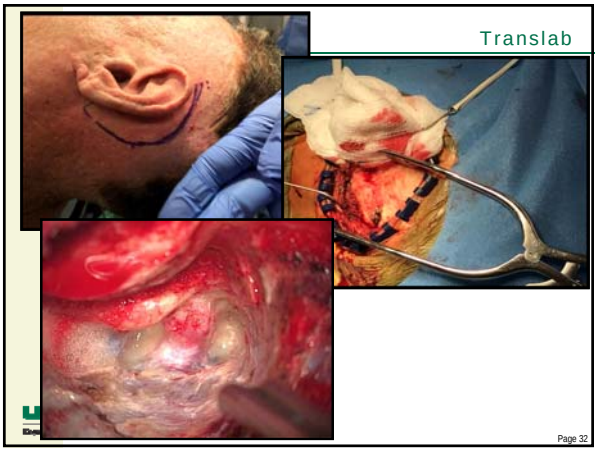

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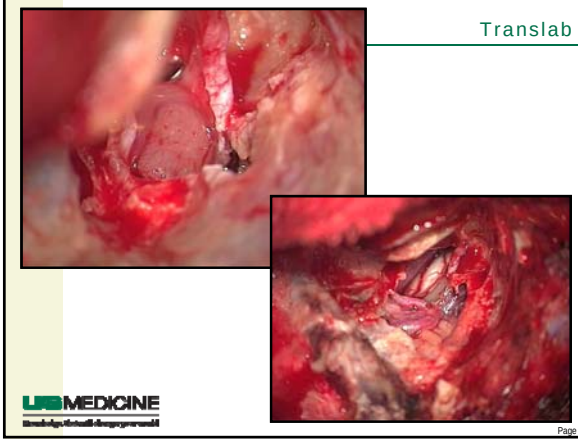

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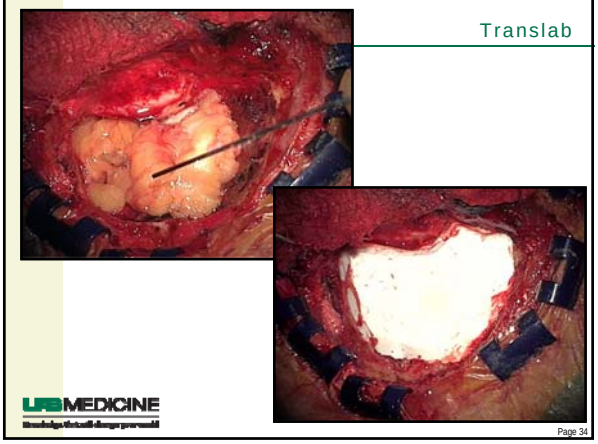

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Facial Nerve Preservation:

Over all Outcomes

Skull Base Cases	# Pts	1-2	1	2	3	1-3	4-6
Total	**451**						
Lost F/U	50						24
Pre Op paresis	40	372	361	11	5		24
Sacrificed for Malignancy	57		-	-	-		57
Attempted Preservation	**344**	301	281	20	17	318	23
		87.5 %	81.4 %	5.8 %	4.9%	**92.4%**	**6.7%**

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Facial Nerve Outcomes

Non-Malignant Cases

	# Pts	1-2	1	2	3	4-6
Total	287	245 87%	235 82%	13 4.5%	16 5.5%	23 8%
Acoustic Neuroma	118	90 76.3%	82 70%	8 6.7%	13 11%	15 12.7%
Meningioma	49	41 84%	39 80%	2 4%	1	8 16%
Hemifacial spasm	9	9 100%	8 89%	1 11%	0	0
Aneurysm/AVM/Encephalocele/Complicated Infection	48	48 100%	47 98 %	1 2%	0	0
Paraganglioma/FN, CNV Neuroma/Chordoma/Epidermoid/ schwannoma	62	60 97%	59 95%	1	2	0

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Acoustic Neuroma: *Postoperative Facial Nerve Outcomes*

	# Pts	1-2	1	2	3	1-3	4-6
Total	118	90	82	8	13		15
		76.3%	70%	6.7%	11%	87.3%	12.7%
Small	41	41	37	4	0		0
< 16 mm		*100%*	*91%*	*9%*		100%	
Medium	32	25	21	4	5		2
16-25 mm		*78%*	*66%*	*13%*	*16%*	*94%*	*6%*
Large	43	22	22	0	8		13
> 25 mm		*51%*	*51%*		*19%*	*70%*	*30%*

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Challenges – NF2

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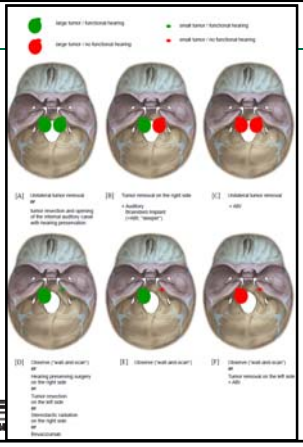
NF2



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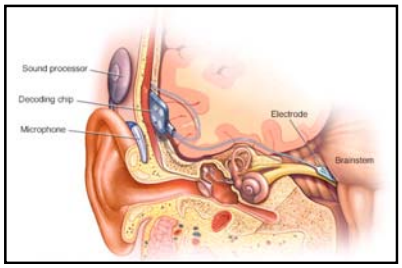
ABI



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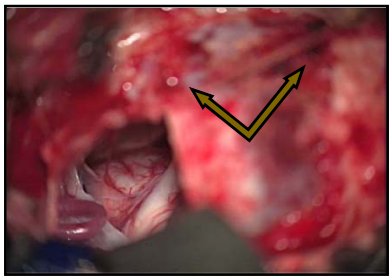
CN9 – CN7 Junction: 90º



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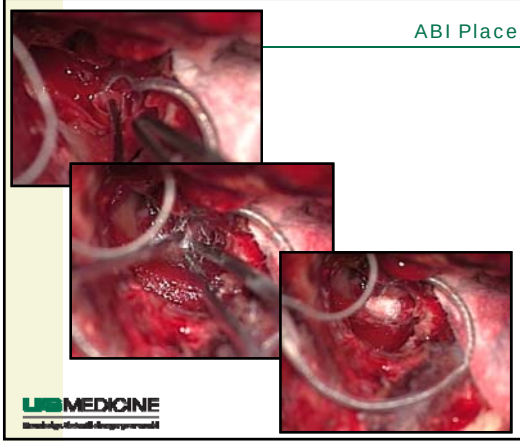
ABI Placement



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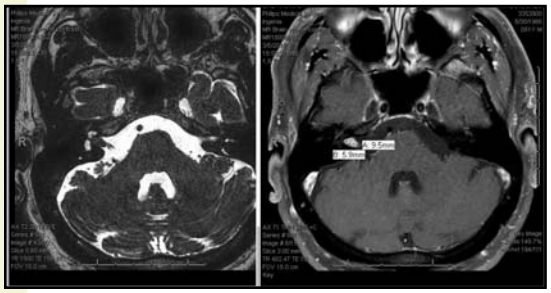
Servicable Hearing



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