Managing patients with vestibular schwannomas: changes in our practice

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Vestibular schwannoma or acoustic neuroma

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- Benign tumour arising from the sheath of mainly the vestibular nerve
- Incidence 1:100,000/ 6% intracranial tumours/ 85% cerebellopontine angle tumours
- Based on temporal bone studies 0.8-2.7% (silent cases)
- The lifetime risk of an individual developing a VS in England is 1/1,000

Nikolopoulos et al, Otol Neurotol 2010
Kontorinis and Crowther, BMJ, 2014

History

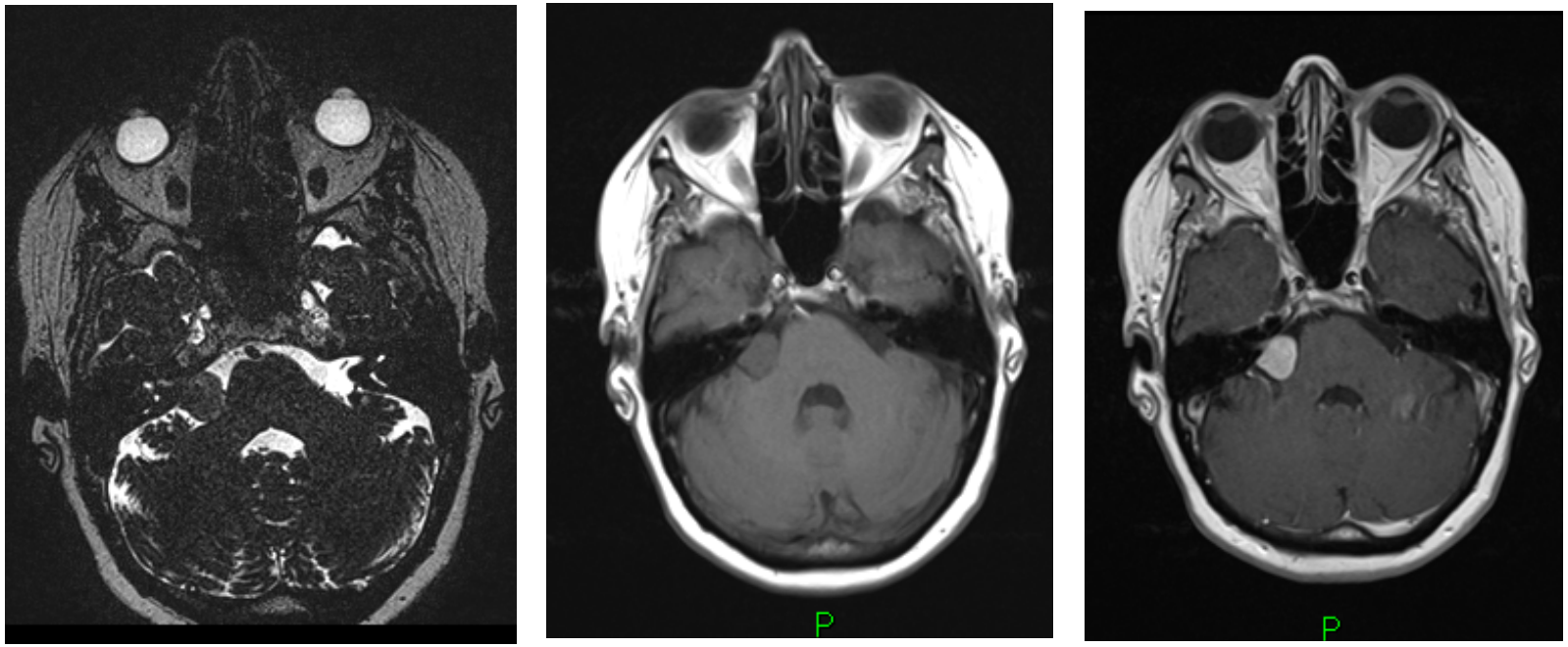
- Term neuroma was applied by Virchow (appearance, histology)
- Murrey and Stout identified the cells of origin to be Schwann cells
- Tumour arises from the vestibular nerve
- The term vestibular schwannoma proposed and accepted in 1992 (consensus)

Murrey and Stout, Am J Pathol 1940
Eldridge and Parry, Neurosurgery 1992

Diagnosis

- Commonest presenting symptoms:
  - Asymmetric sensorineural hearing loss (90%)
  - Unilateral tinnitus (8-13% but in 60-83% with HL)
  - Vertigo/ imbalance (7-26%)

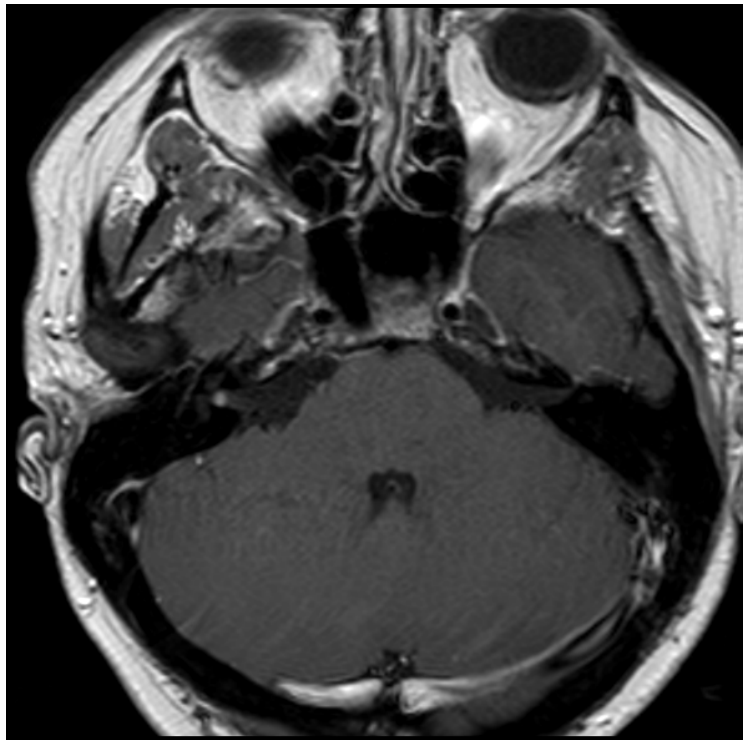
- Imaging with MRI:
  - MRI internal auditory meatus (IAM)
  - Intravenous gadolinium administration
  - Typical appearance



Hypo-intense on T2 weighted imaging, iso-intense on non-contrast T1 weighted imaging, and it enhances strongly on T1 weighted imaging after administration of intravenous contrast

On natural history

- Initially, the treatment was surgical
- VS was a tumour that had to be removed!



Anaizi et al, J Neurol Surg B S B 2016
Penk and Wilkinson, J Laryngol Otol 2016

Management

- Natural history: growth, arrest of growth

  Up to 70% of VS will NOT grow

- Aim to try and stop further growth

- Avoid morbidity of intervention

- Preservation of cranial nerve function (facial nerve, hearing, improve balance)

Treatment options

- Wait-watch-rescan

- Radiotherapy (stereotactic radiosurgery-SRS, gamma knife)

- Microsurgery

Translabyrinthine, retrosigmoid, middle fossa approach

Decision making

- Treatment depends mainly on the size and growth pattern of the tumour.
- Small, non-growing, or very slowly growing tumours that do not compress the brain are usually treated conservatively.
- Large tumours (>2.5 cm in the cerebellopontine angle) that are compressing the brainstem or the cerebellum are surgically removed
- Growing tumours that do not threaten the brain and smaller tumours can be treated with SRS

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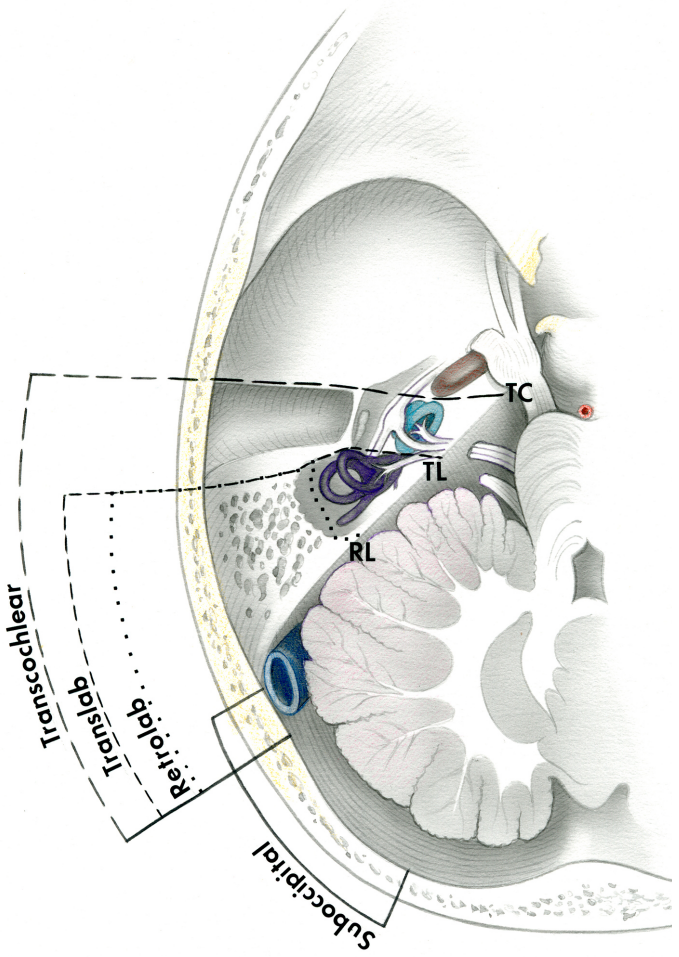
Management is individualised and depends on factors such as the size and growing pattern of the tumour, the patient's age and comorbidities, the severity of the symptoms, and the patient's wishes.

It's the patient's hearing, balance, facial nerve and life!

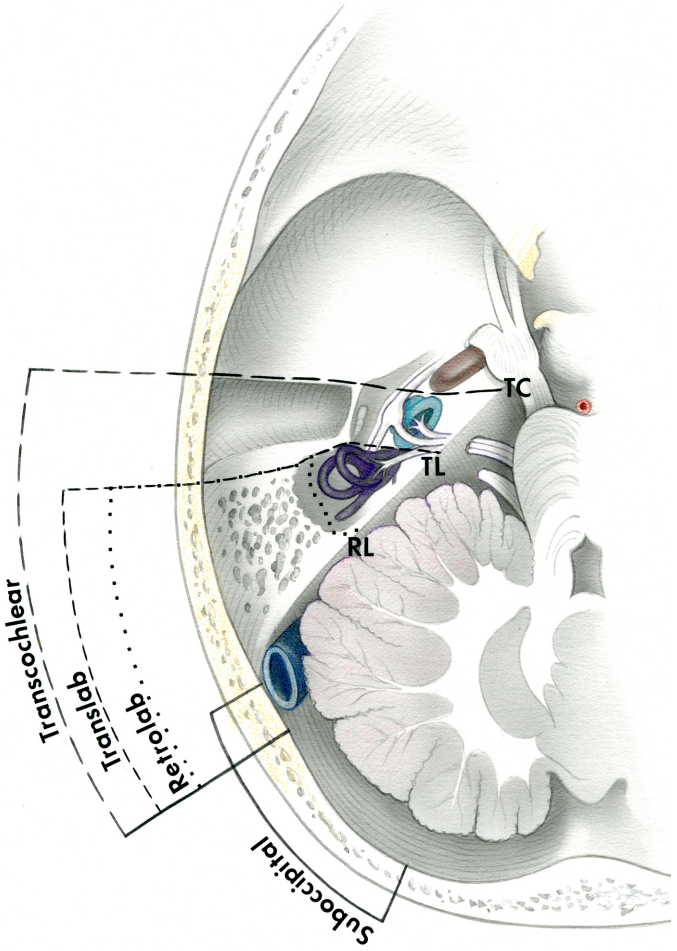
Approaches

- Translabyrinthine
- Transcochlear (transotic/ transpetrous) (+extended)
- Retrolabyrinthine
- Infralabyrinthine
- Retrosigmoid
- Middle fossa

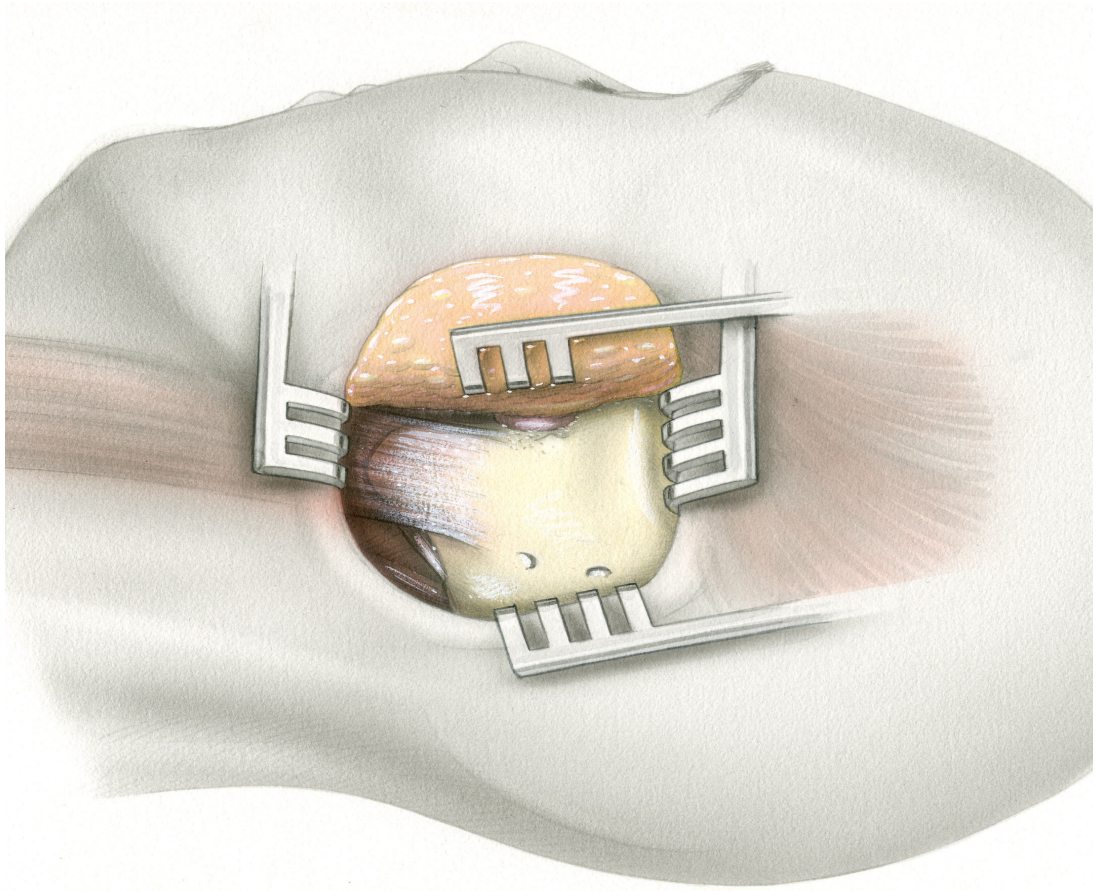


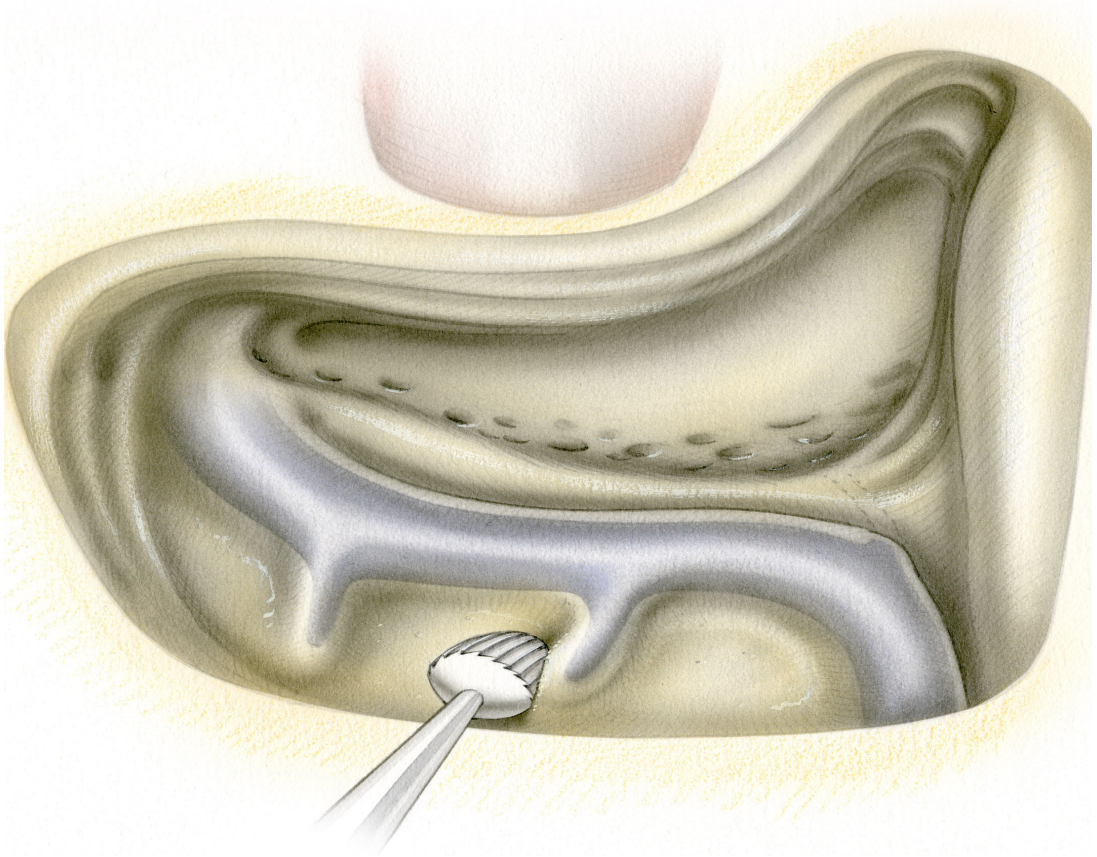
Translabyrinthine

- Lesions of IAM and CPA of any size
- Limitations: anterior extension of tumour
- Morbidity: deafness, disequilibrium

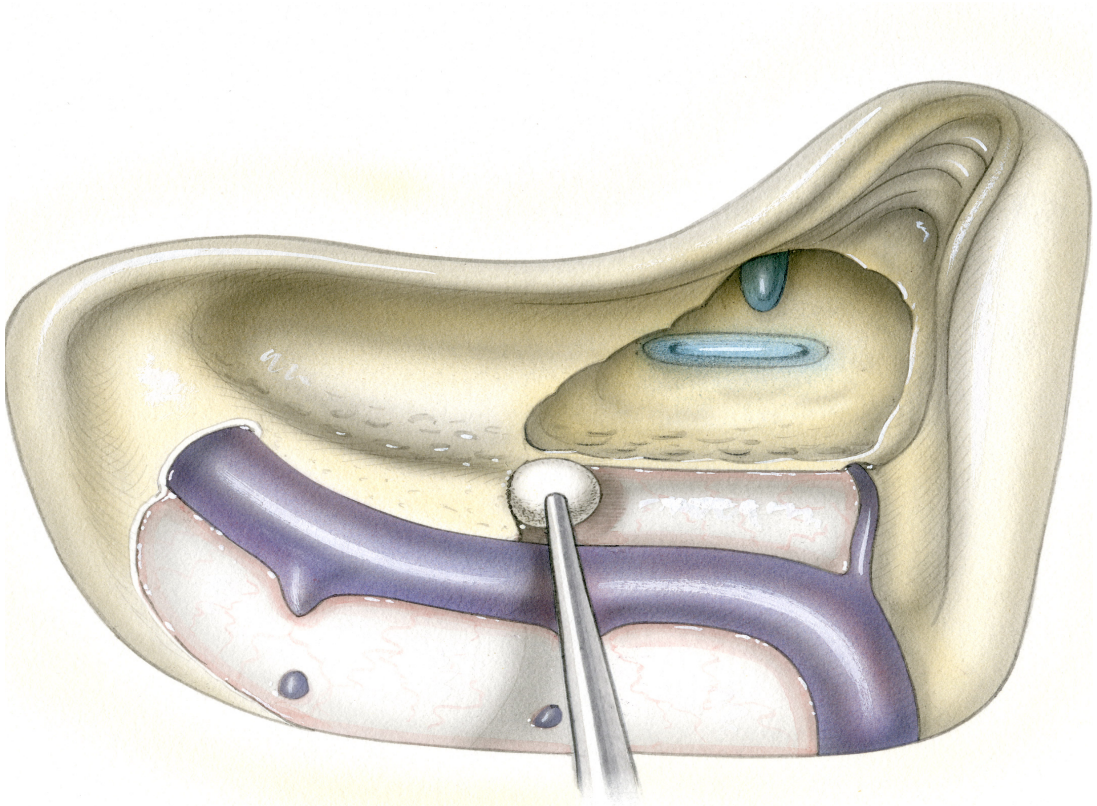


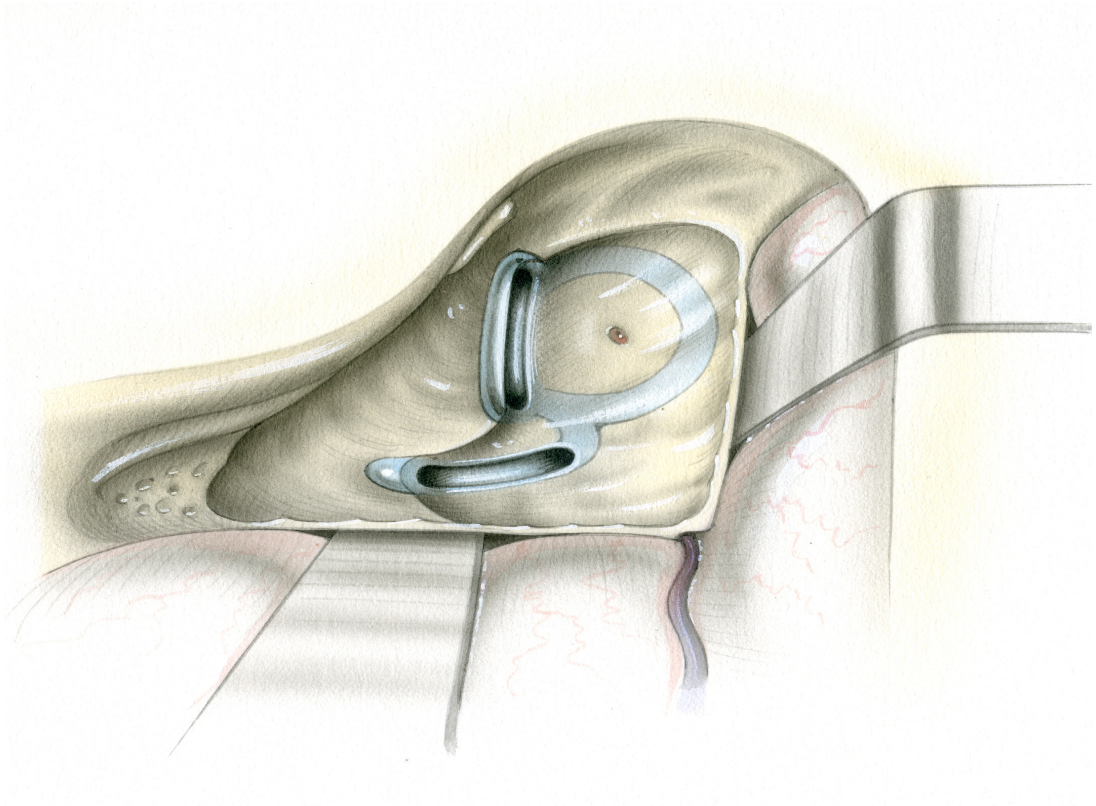
Translabyrinthine



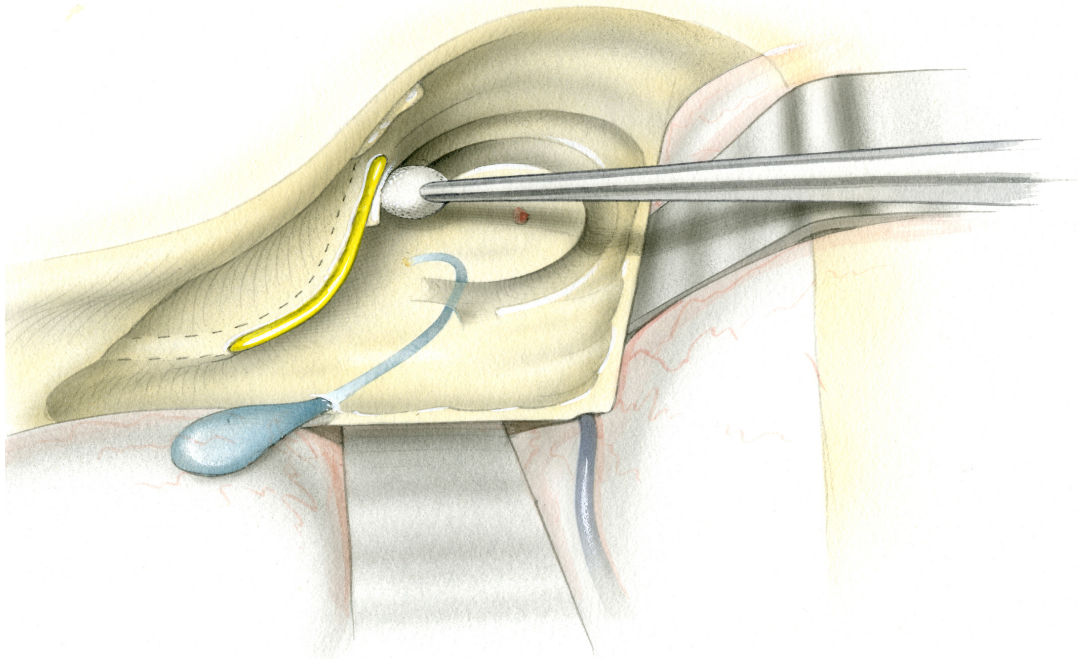


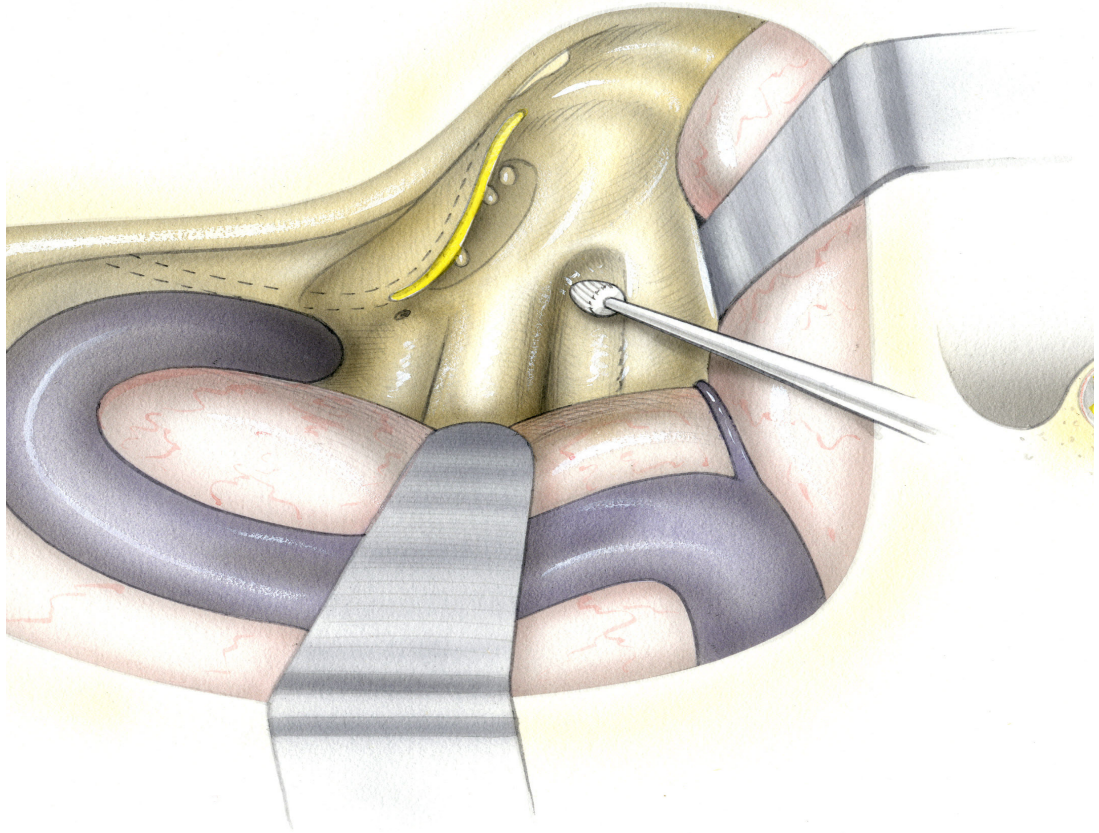
Translabyrinthine



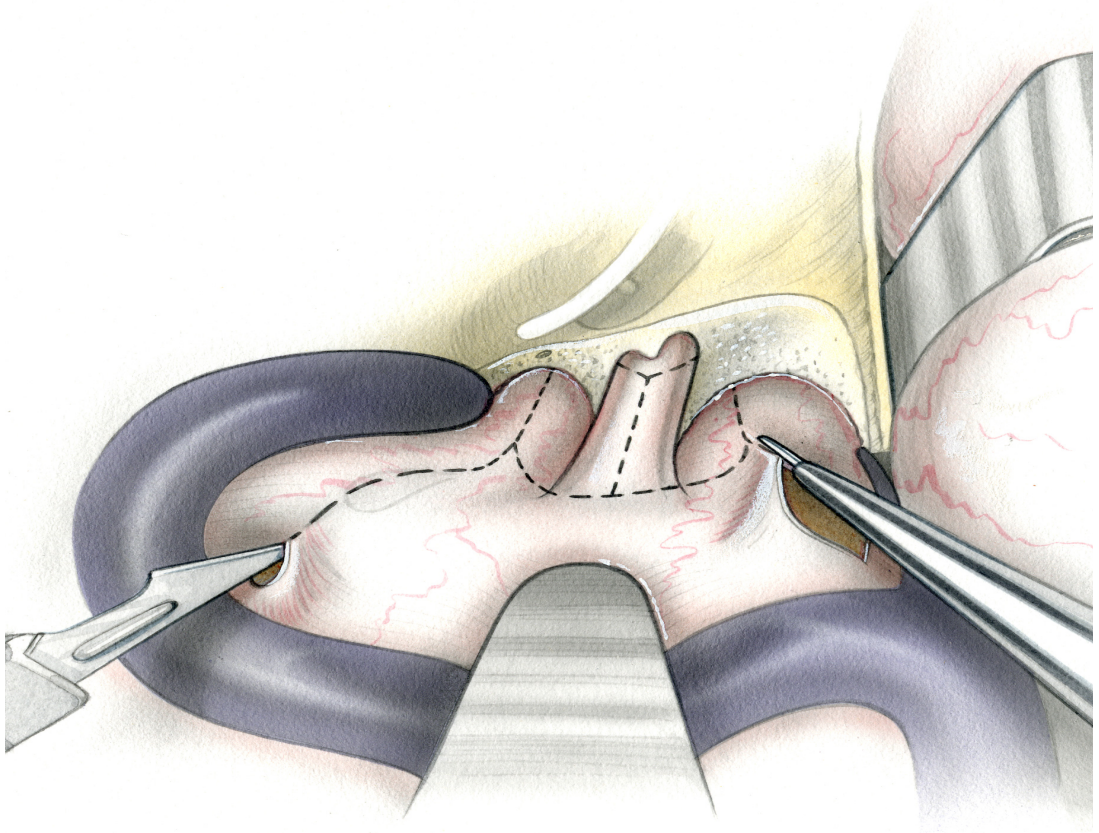


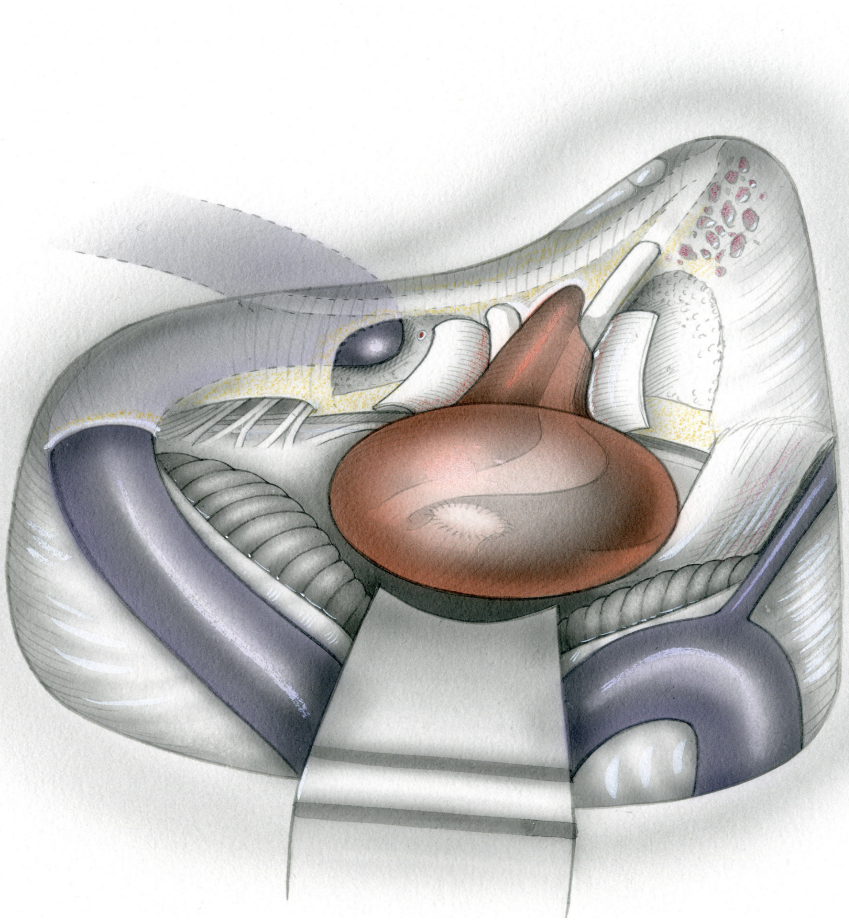
Translabyrinthine





Translabyrinthine





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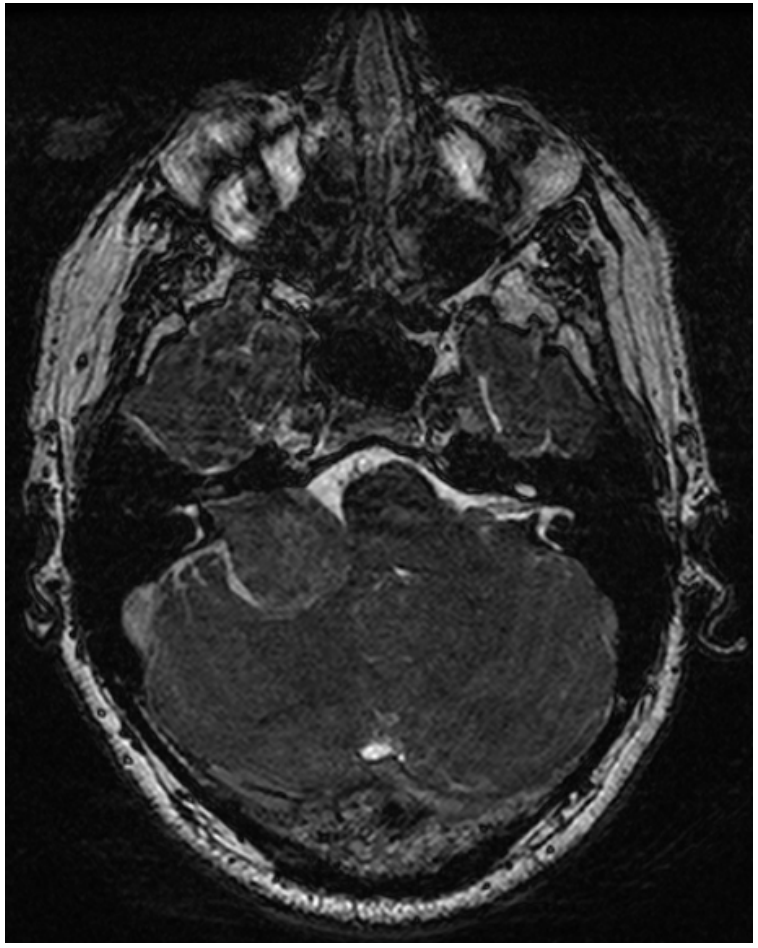
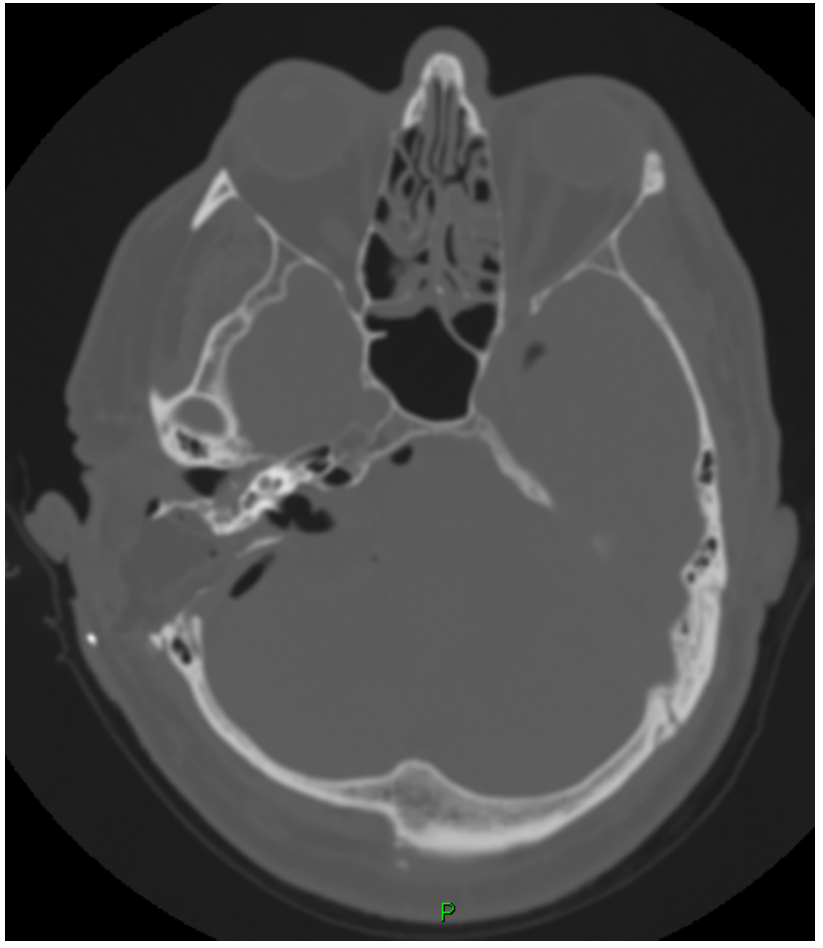
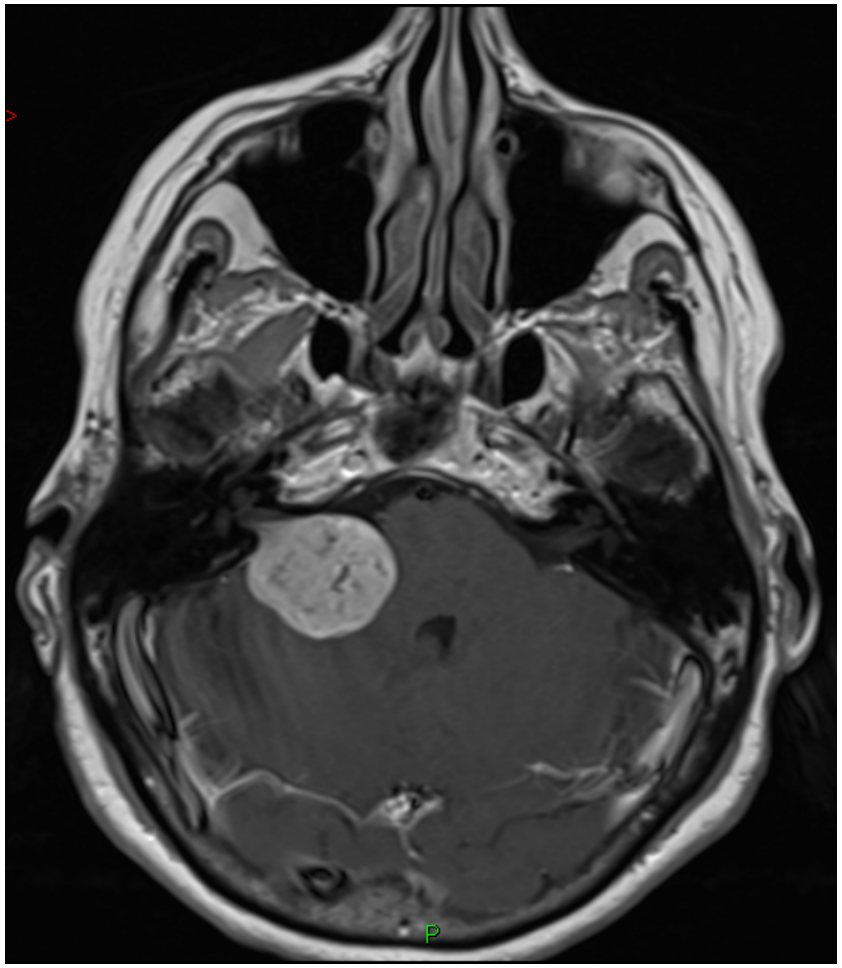
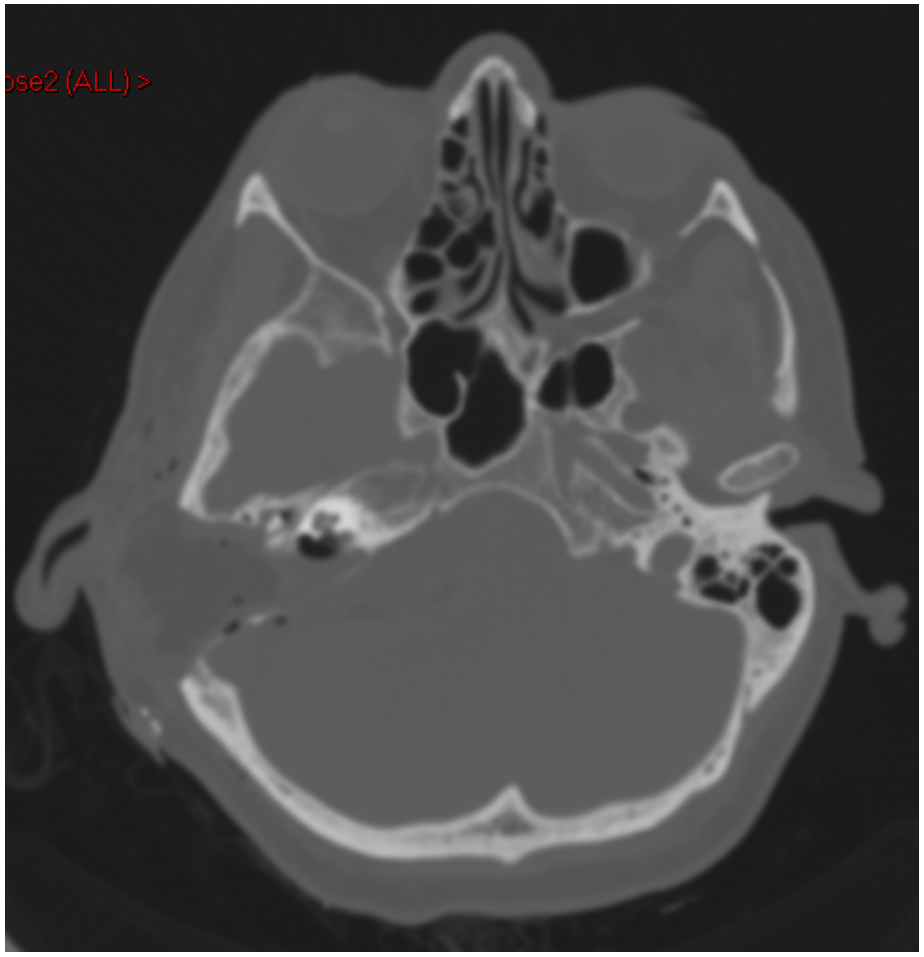
Translabyrinthine



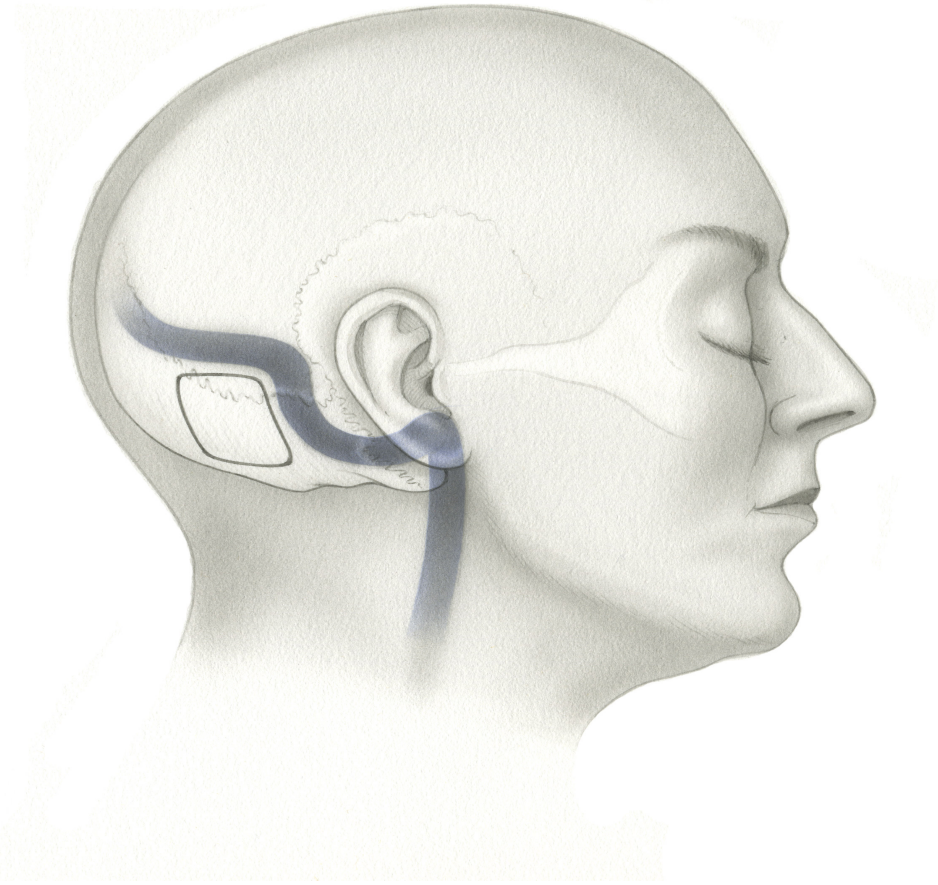


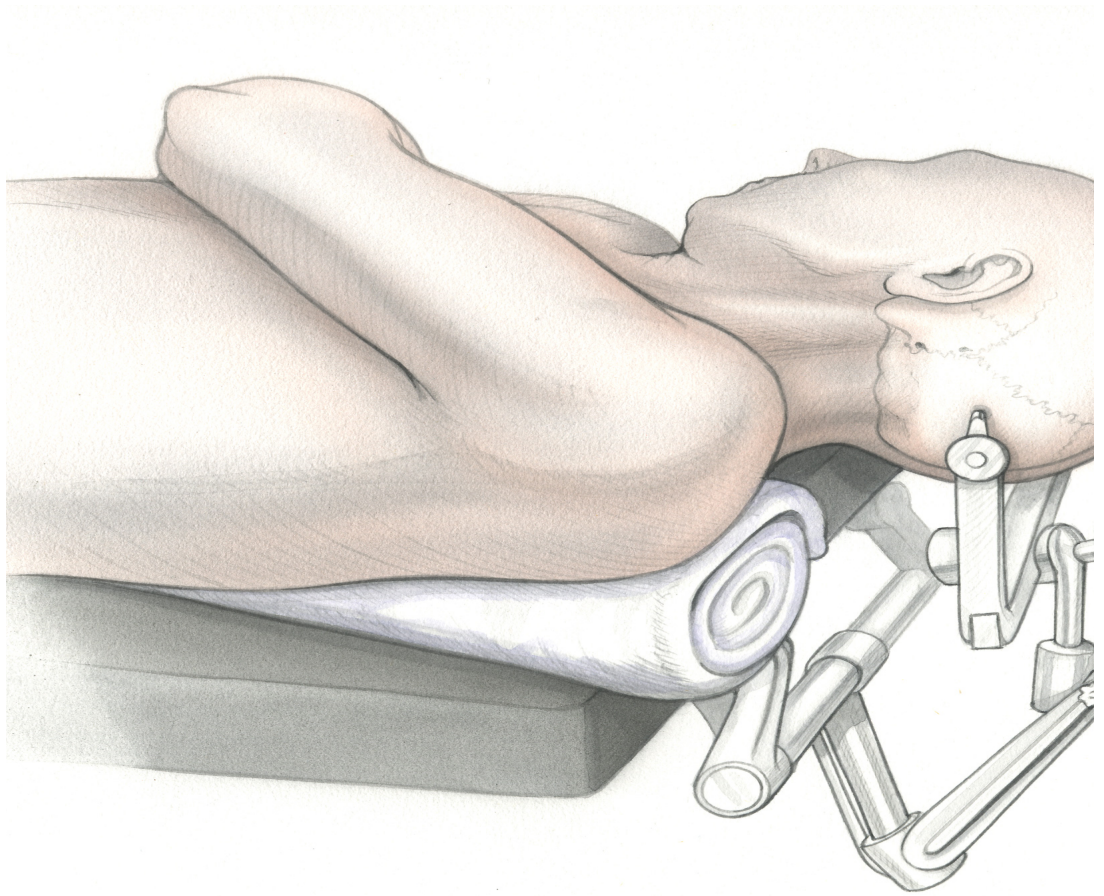
Translabyrinthine





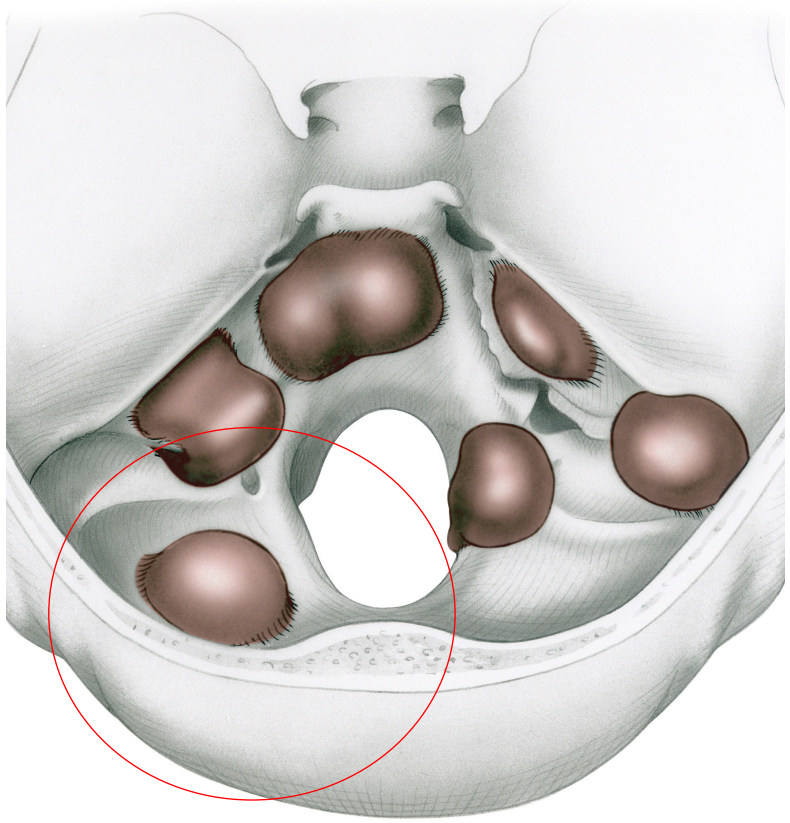
Retrosigmoid



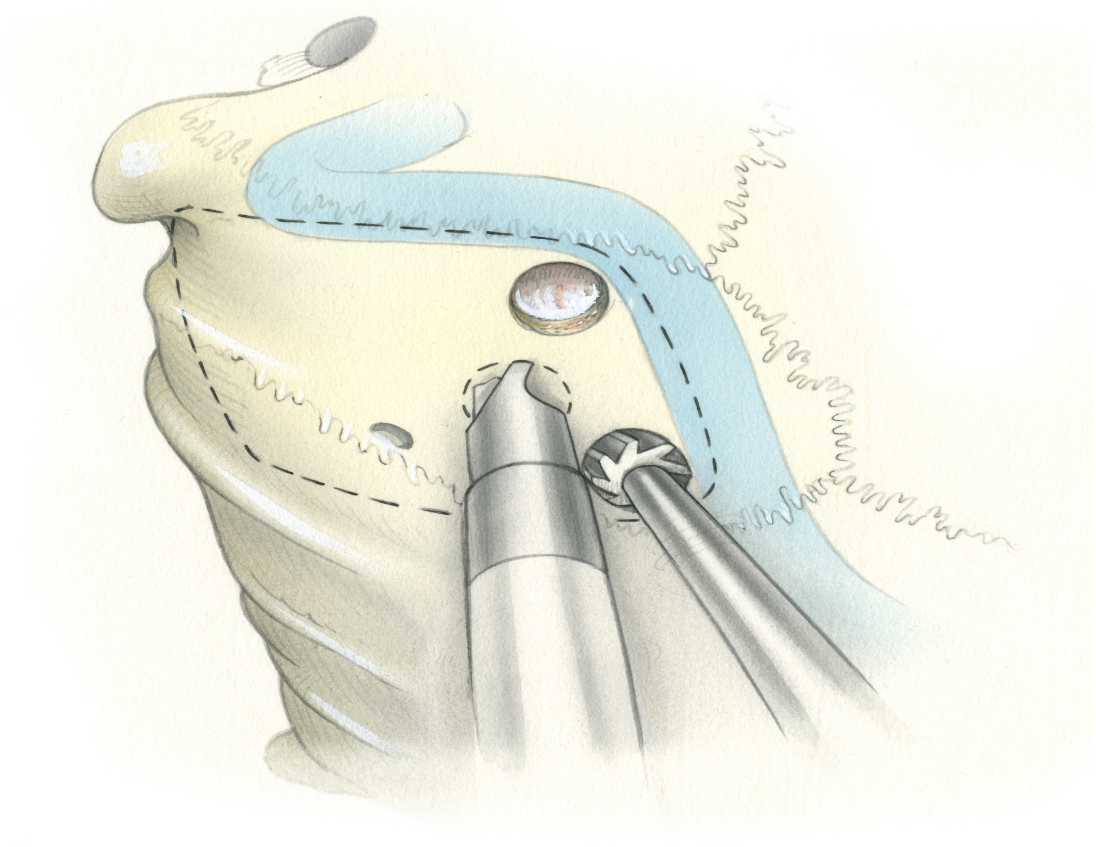


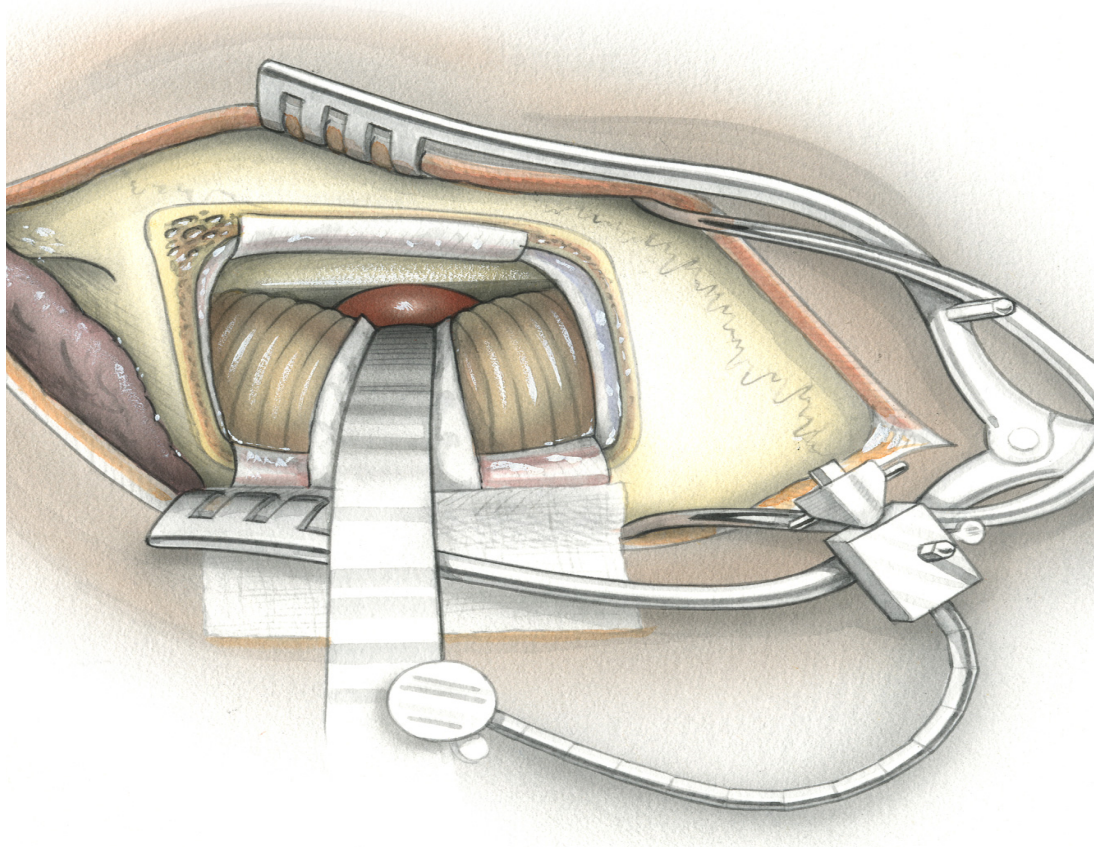
Retrosigmoid

- For tumours with minimal IAM extension
- (?) hearing preserving
- Favourite neurosurgical approach
- Faster than translabyrinthine

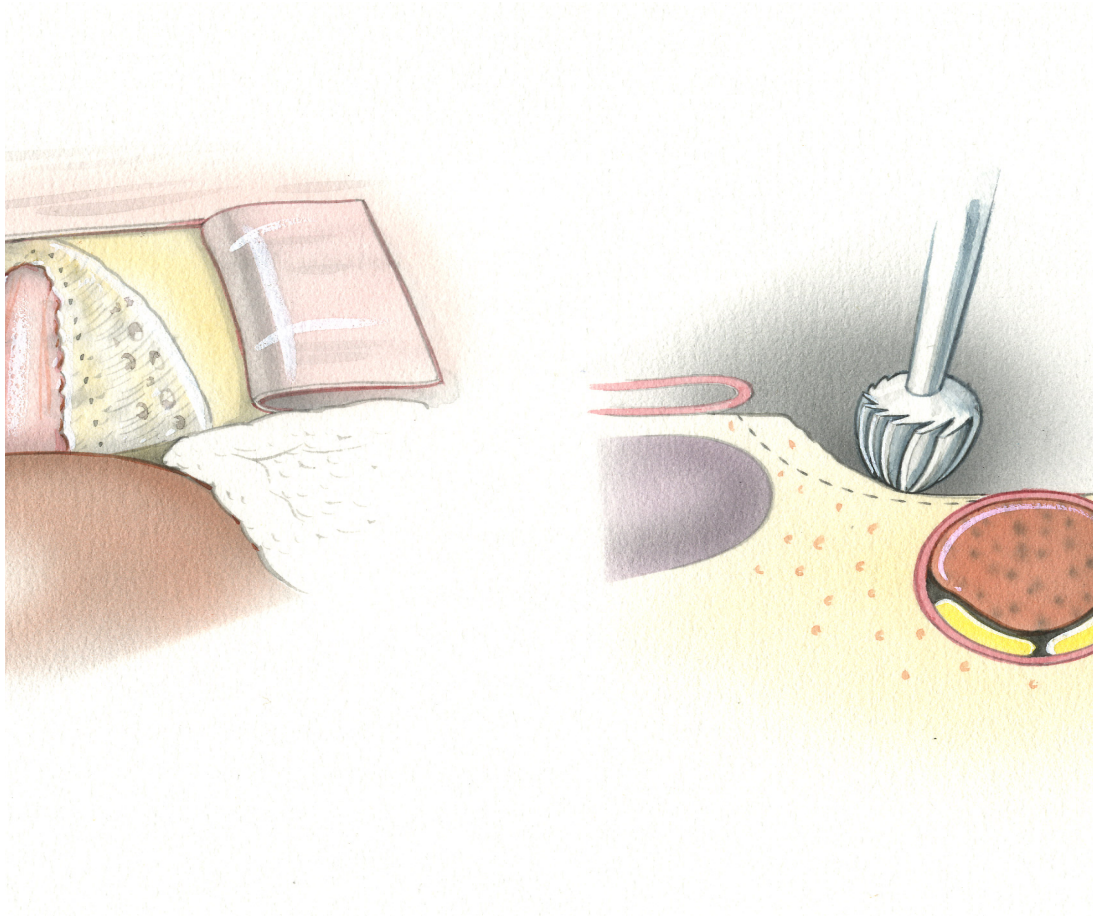


Retrosigmoid

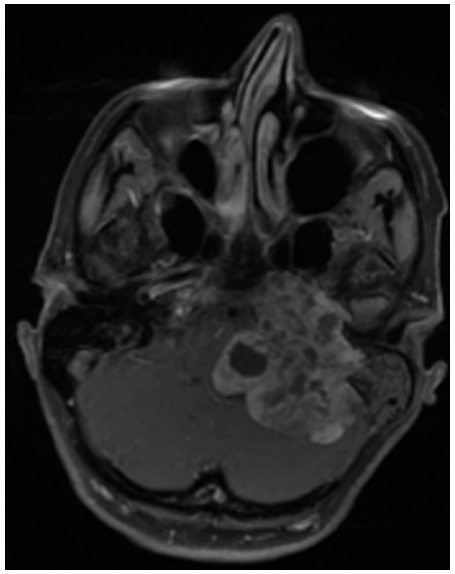
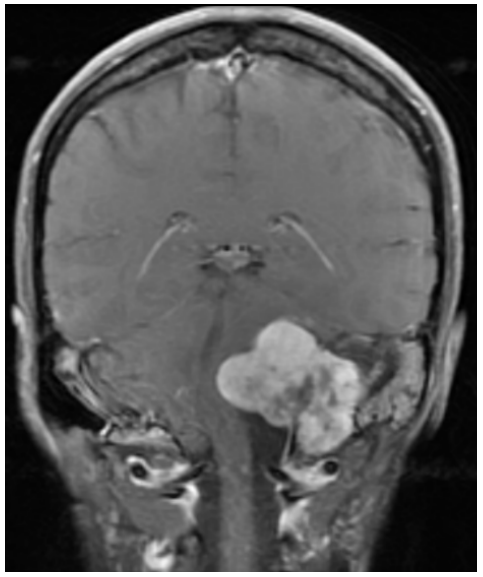


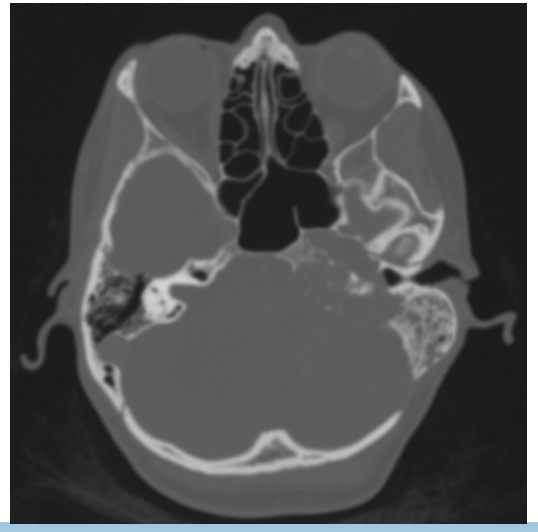
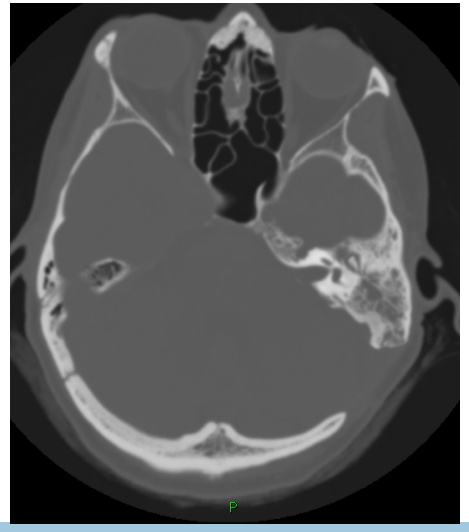


Retrosigmoid



Retrosigmoid

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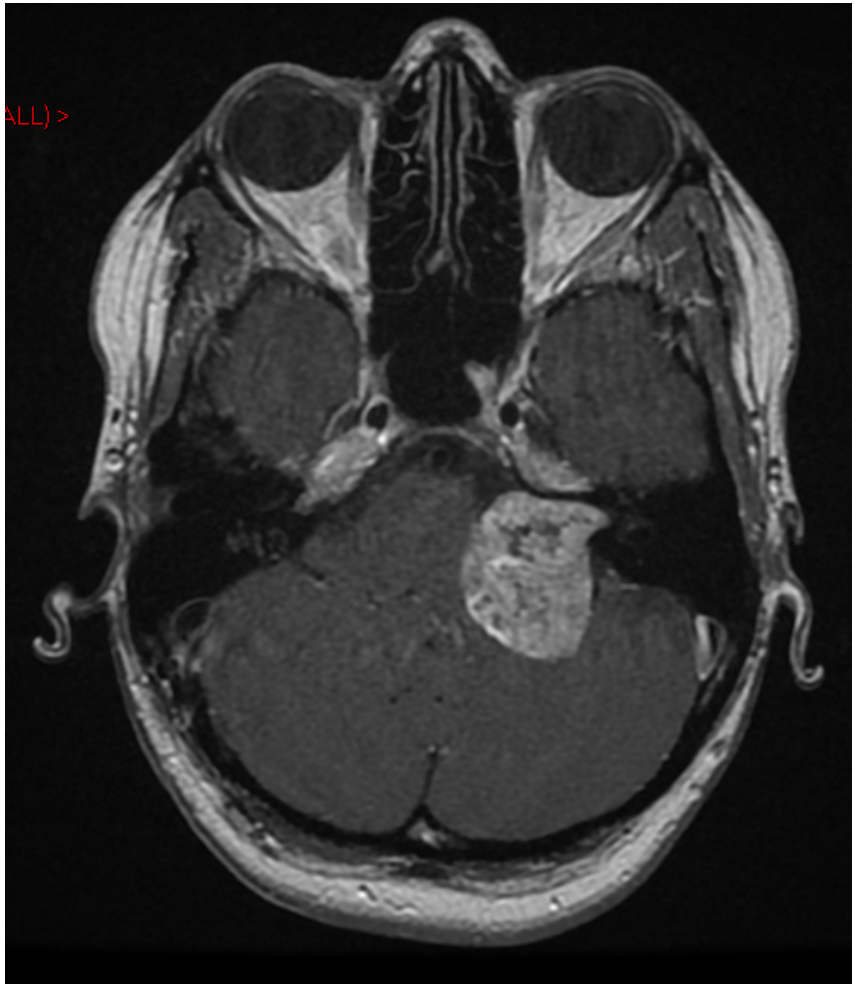
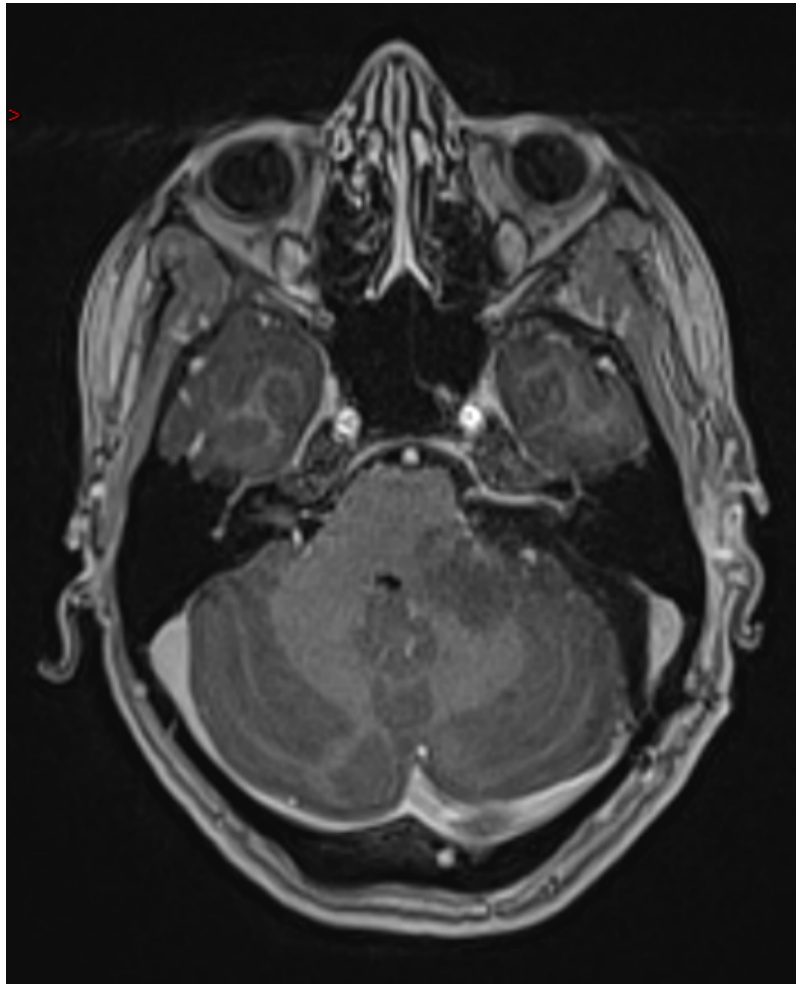
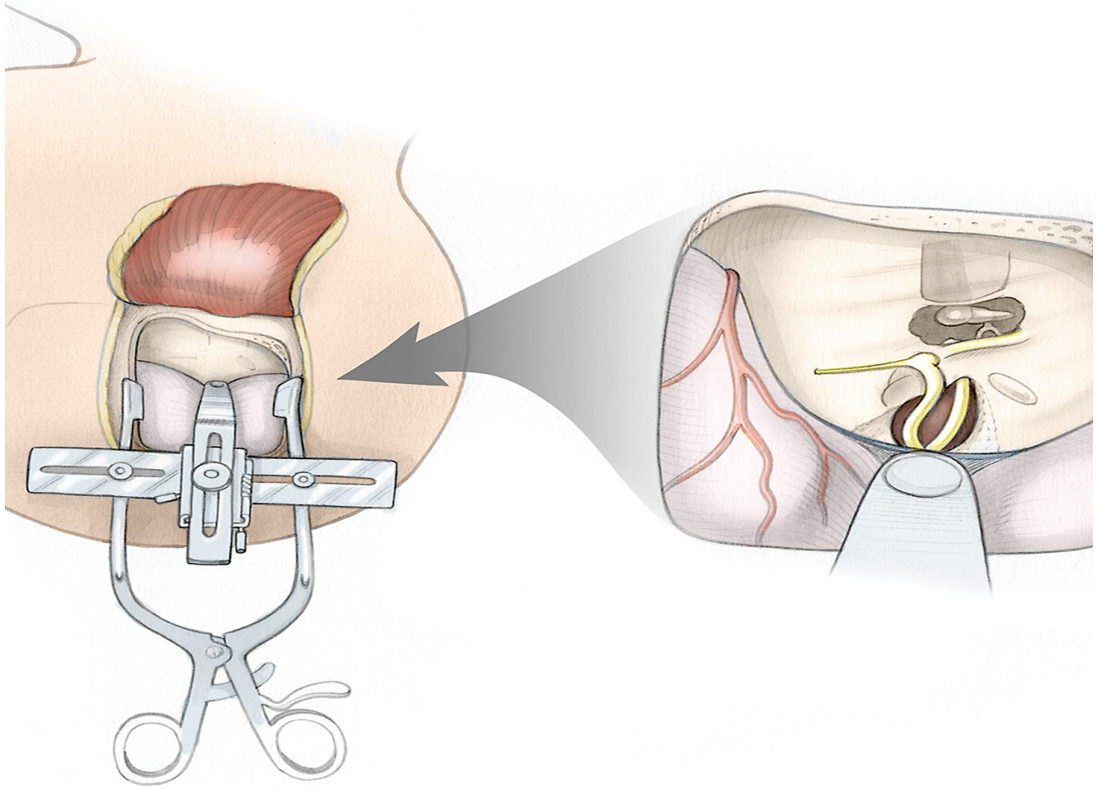
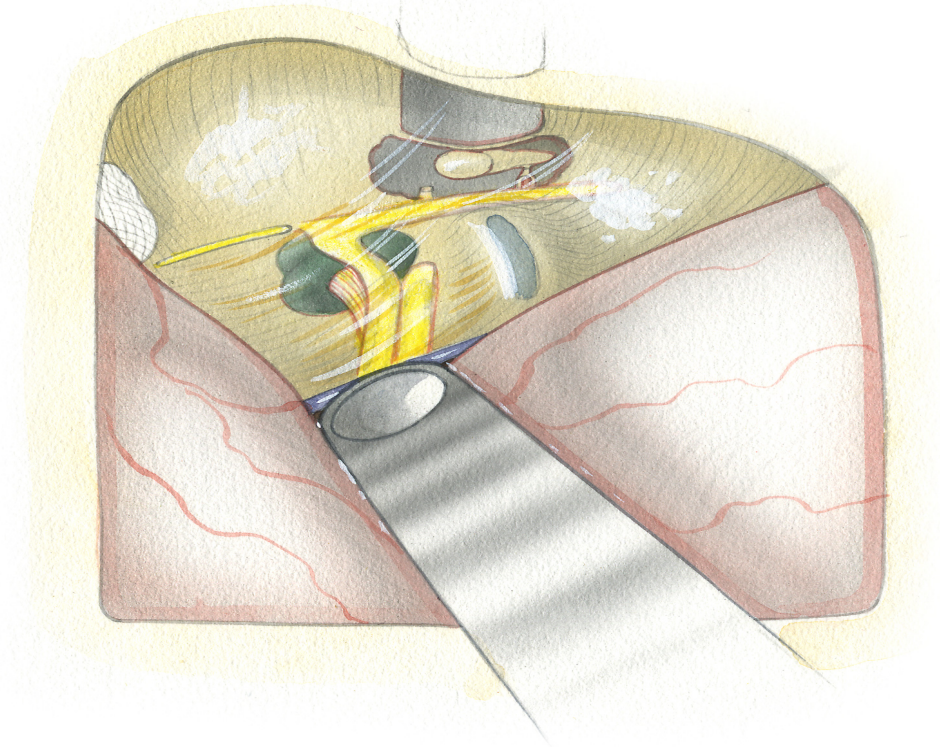




Middle fossa





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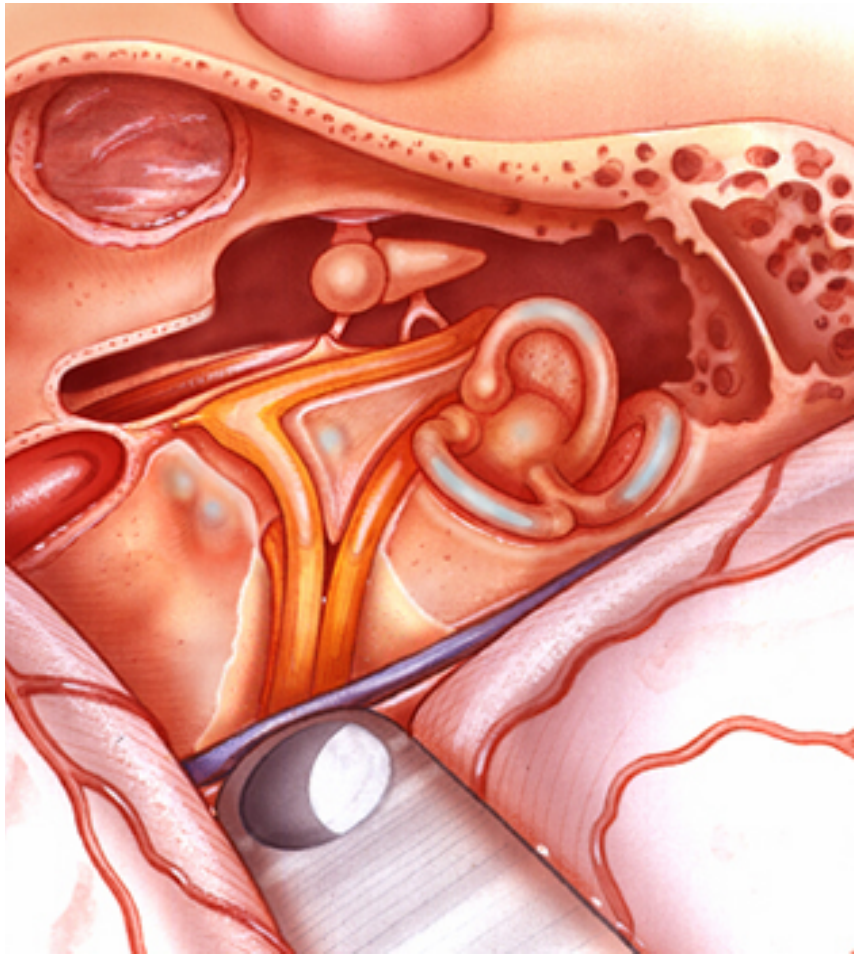


What can possibly go wrong?

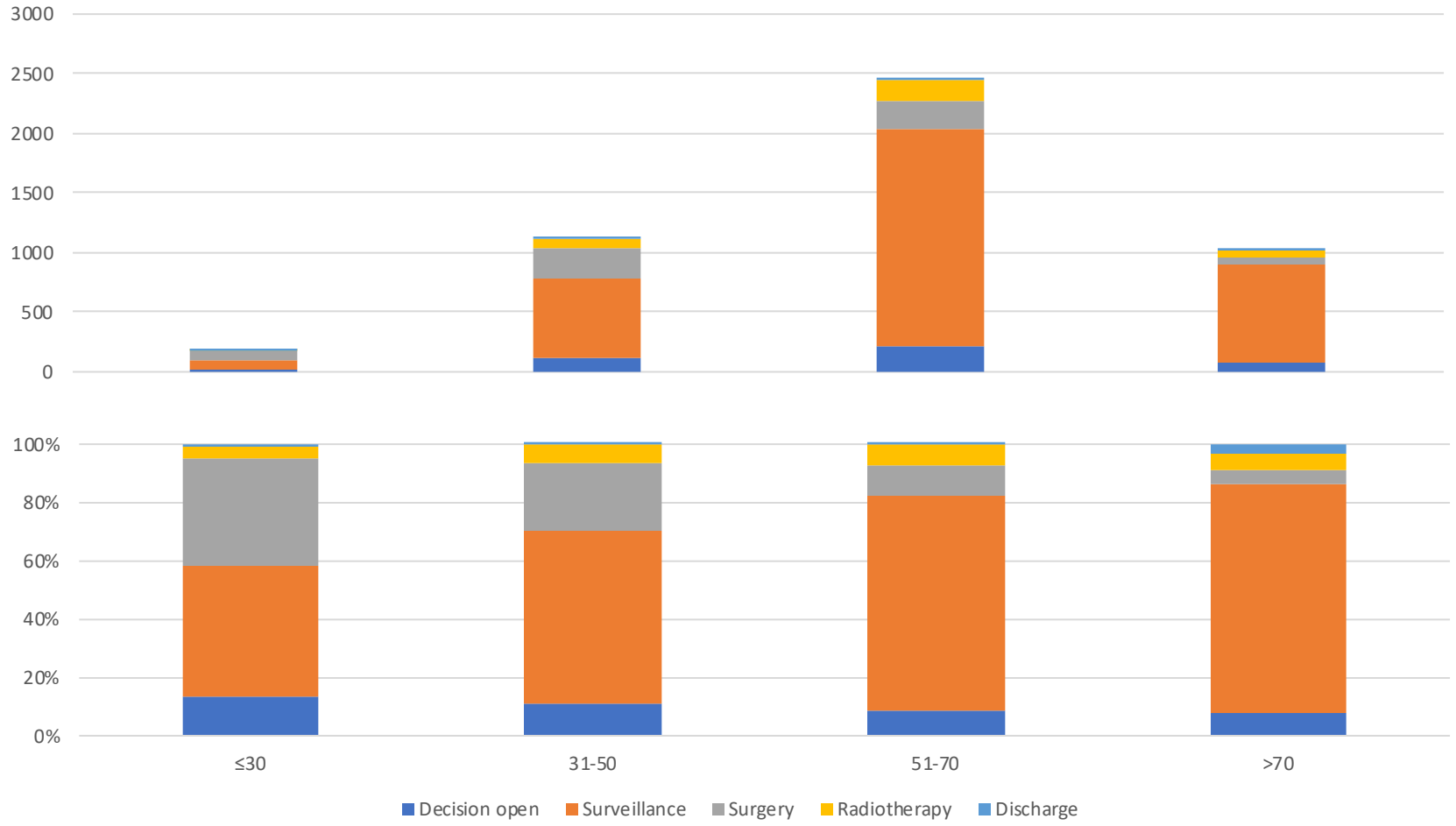
- Intracranial bleeding
- Meningitis
- CSF leak (wound, rhinorrhea)
- Facial nerve palsy (impact on other cranial nerves depending on size)
- Disequilibrium, chronic dizziness
- Stroke
- Death

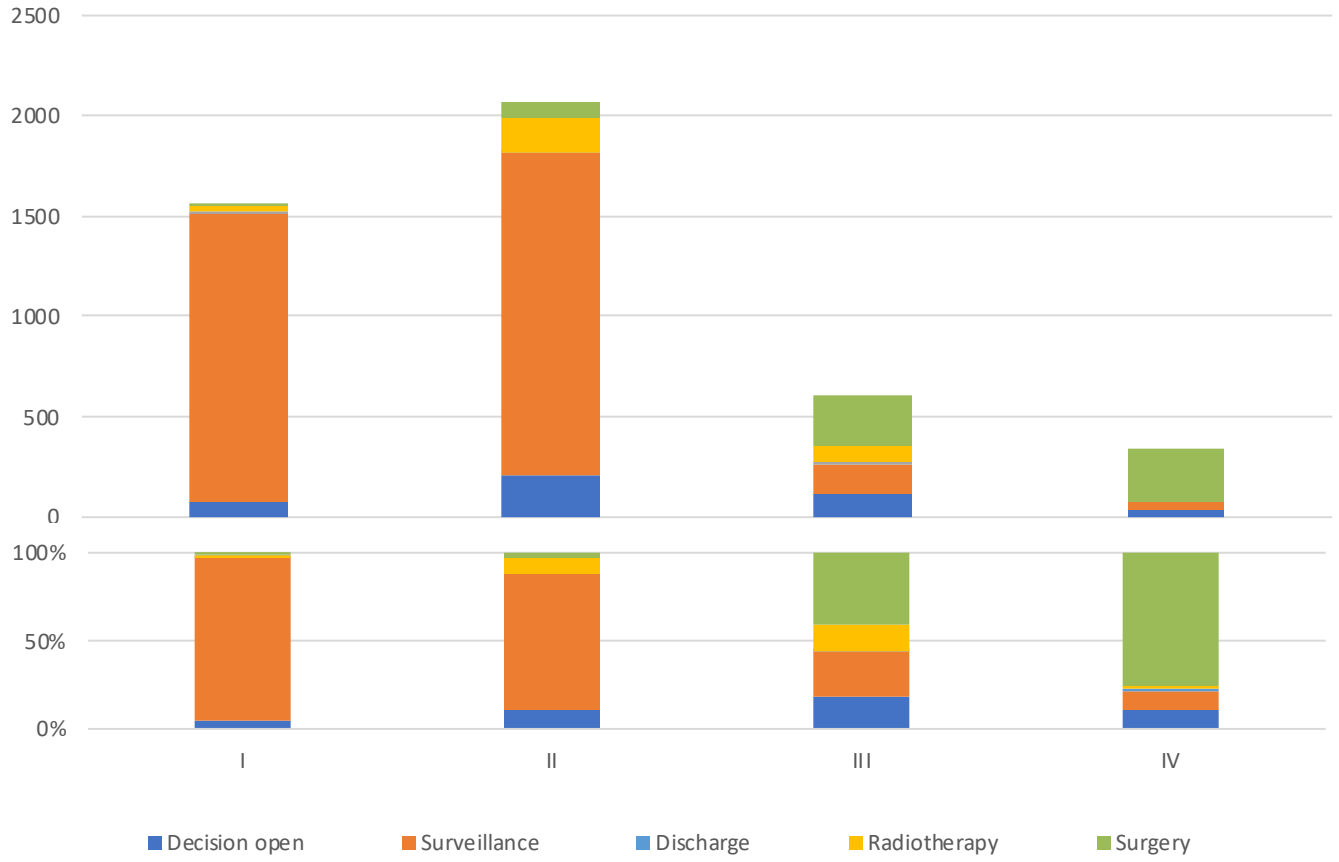
Can be a life changing event!

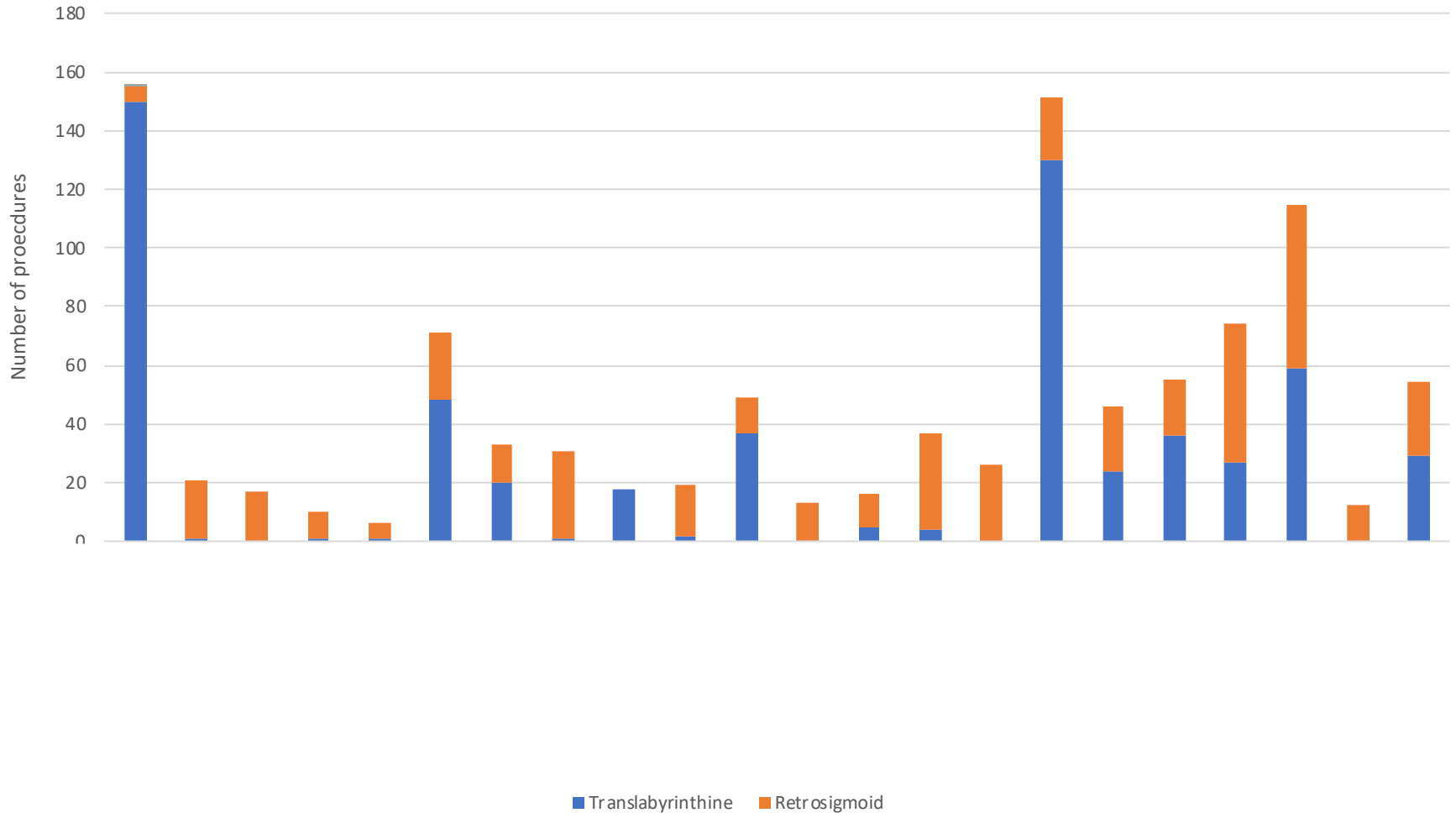
UK wide

Table 4.10 No intervention 3 year survival for patients adopting a surveillance strategy: tumour size related to patient age					
	Intracanalicular	Small	Medium	Large	
15-30 years	-	33%	0%	-	31%
31-40 years	76%	70%	-	0%	71%
41-50 years	80%	63%	15%	0%	64%
51-60 years	76%	65%	50%	0%	67%
61-70 years	86%	65%	56%	100%	74%
>70 years	86%	80%	62%	80%	81%
	81%	68%	47%	47%	

Changing the paradigm




2500
2000
1500
1000
500
0
100%
50%
0%
I
II
III
IV
Decision open
Surveillance
Discharge
Radiotherapy
Surgery


180
160
140
120
100
80
60
40
20
0
Number of proecdures
Translabyrinthine
Retrosigmoid

Management
…Times are changing

Decision making

- Treatment depends mainly on the size and growth pattern of the tumour.
- Small, non-growing, or very slowly growing tumours that do not compress the brain are usually treated conservatively.
- Large tumours (>2.5 cm in the cerebellopontine angle) that are compressing the brainstem or the cerebellum are surgically removed.
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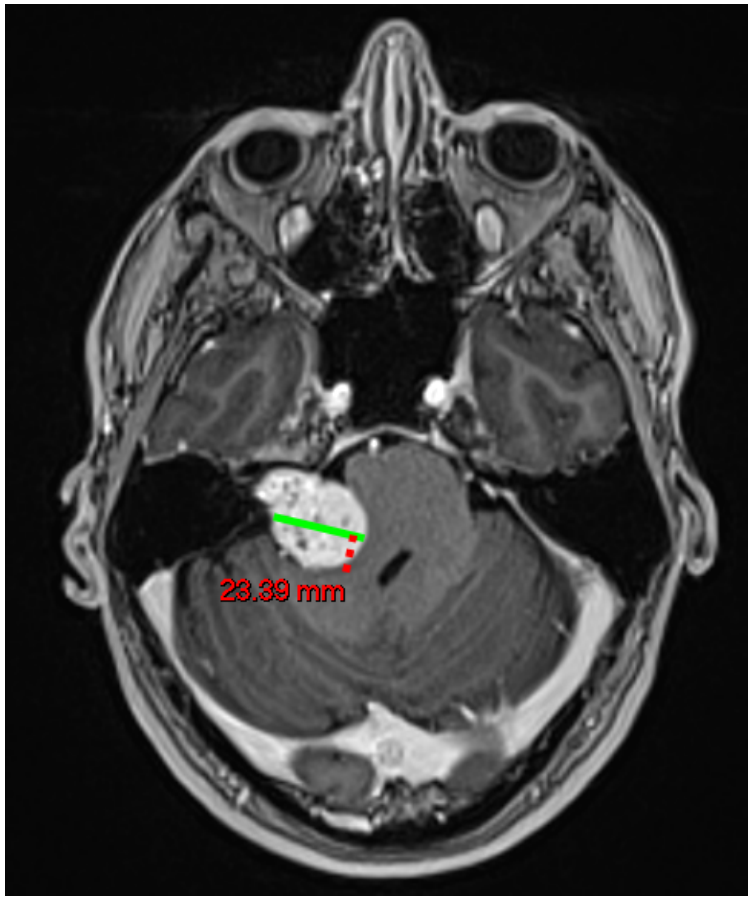
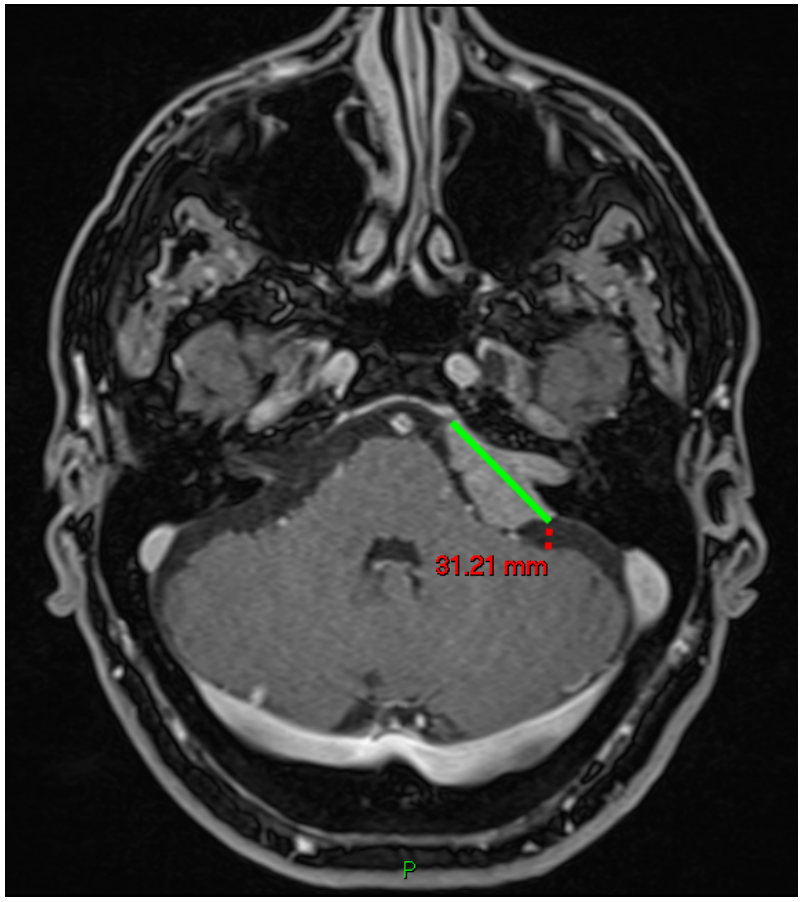
Any concerns?





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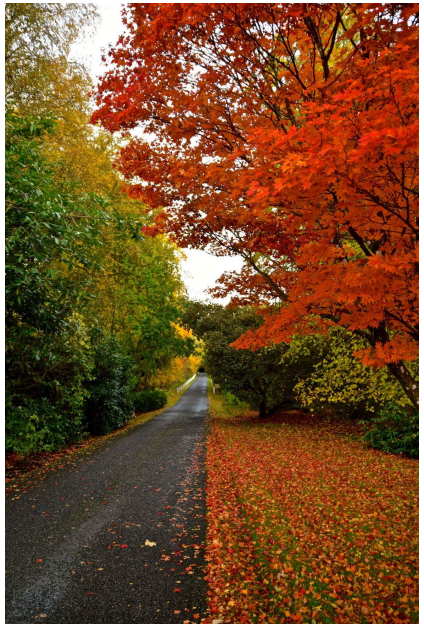
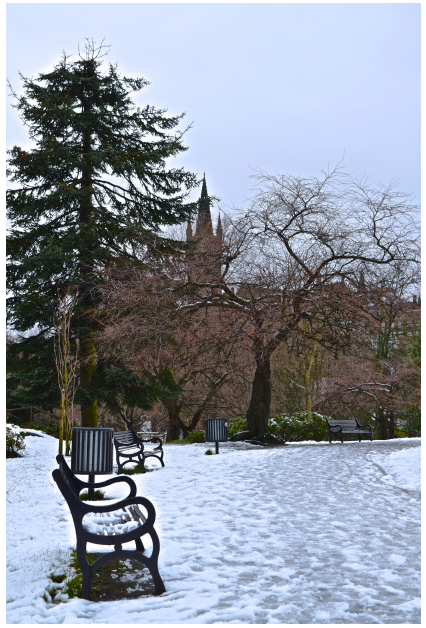
Thank you





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