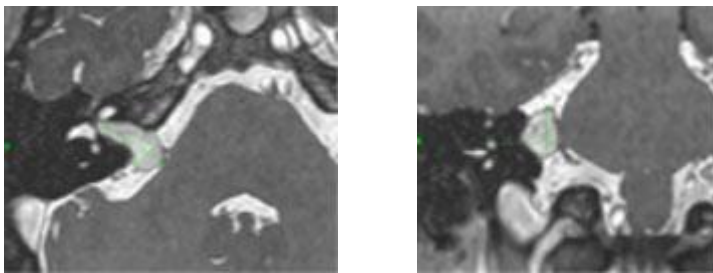


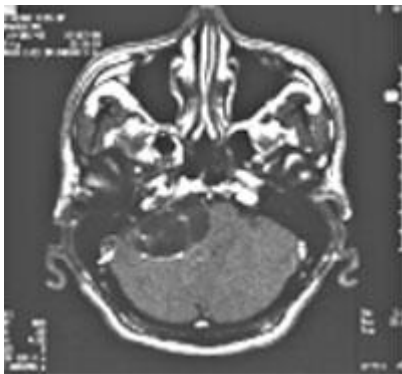
## Acoustic Neuroma

### Synonyms: vestibular neuroma

It is a benign tumor arising from the sheath of the nerve inside the inner ear. Most of the time, it is the vestibular nerve (the nerve of balance) which is involved. Interestingly, it is the nerve of hearing which sits right next to the vestibular nerve, gives the first warning sign of the tumor: progressive deafness on that side. **It is advisable to investigate one sided hearing loss of recent onset.** Do not wait until hearing is completely gone. A ear specialist will distinguish whether the deafness is due to nerve damage or conduction defect. **The best way to diagnose acoustic neuroma is a high resolution MRI of the brain with thin slices at the internal ear level using a special contrast agent (Fig 1).**



When the tumors grows outside the inner ear towards the brain stem, it can cause facial numbness, unsteadiness, poor coordination, headache and vomiting, in addition to deafness. Today, one still sees large tumors (Fig 2), not from patient seeking advice late, but from poor physician awareness.



Once diagnosed, there are 2 options:

1. **Wait** for 6 months **if the tumor is very small**. Repeat MRI then. Use volumetric method to compare the volume of the tumor. Do not rely on eye ball or 2D comparison. Do not wait if growth of the acoustic neuroma is detected. The wait and see policy may risk losing hearing.
2. Seek the opinion of the specialist who is usually a neurosurgeon.

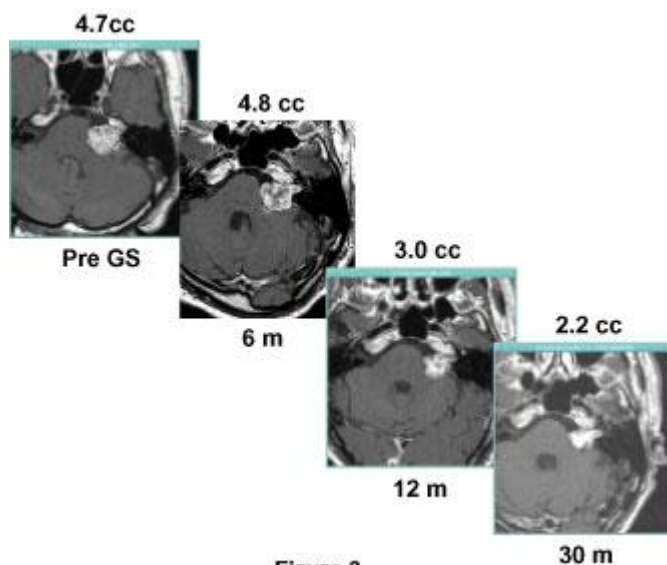
## **Available treatment modalities:**

### **1. Microsurgery**

It used to be the only treatment. Success depends on the expertise of the neurosurgeon. The best results come from centers with large experience: 1% death rate, 10% paralysis of the face, plus 10% other complications which are not life threatening (reference). Despite the best effort, there is a 10% chance of recurrence in 10 years' time. Not all centers can achieve these results. A well known neurosurgeon said it takes 200 operations to achieve expert status. Expect less satisfactory results in average hands: 5% death rate, 30% facial paralysis, and 15% other complications. A standard uncomplicated recovery usually means several days of intensive care, two weeks of hospital stay and 4 weeks off work.

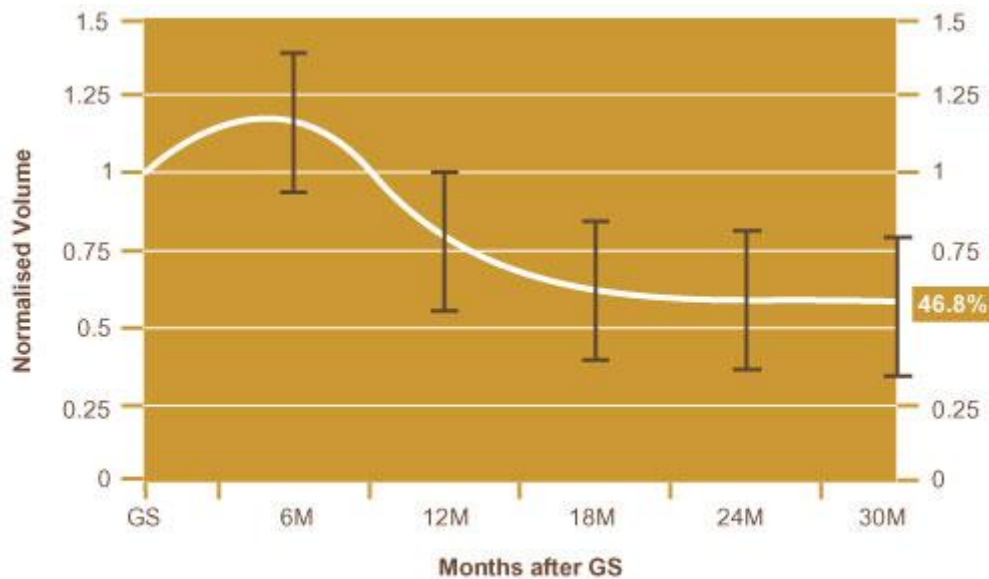
### **2. Gamma Knife surgery**

It is a relative new technology which began in 1970 and now much refined in the 90s as a result of explosive technology in imaging and computer power. The Gamma Knife focuses 201 narrow beams of Gamma ray onto the tumor in a single fraction, locked on target by stereotactic MRI. By disrupting the DNA of tumor cells, it induces programmed cell death and the tumor ceases to grow and shrinks (Figure 3).



**Figure 3**

Since the technique bears similarity to the principles of microsurgery, it is also called radiosurgery. Well documented studies confirm the Gamma Knife being an excellent treatment modality for acoustic neuromas less than 3 cm in diameter<sup>1,2,3,4,5,6</sup>. The smaller the tumor, the best chance of a cure. Cure comes slowly over the course of 1 to 2 years. The mean shrinkage is 46.8% at 2 years (Figure 4).



**Figure 4 Composite volume response of VS that shrank**

General anesthesia is not required. There is no operative mortality. Using modern techniques, facial paralysis is rarer than 1%. The patient goes home the following day. He/she may choose to return to work after several days rest. Like surgery, there is a 10% chance of re-growth of the tumor. In general, tumors larger than 3 cm is best treated by open microsurgery. In difficult cases, a combination of open surgery followed by Gamma Knife may be an excellent strategy.

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