PATIENT
INFORMATION

Gamma knife stereotactic radiosurgery for an acoustic neuroma

This leaflet is for people who are considering gamma knife surgery for an acoustic neuroma. It explains the procedure, its advantages and risks, and aims to answer the main questions you're likely to have. There is a separate general guide to gamma knife radiosurgery which explains the procedure in more detail. For a copy of this, or if you have any additional questions, please speak to your doctor or another member of the gamma knife team.

What is an acoustic neuroma?

An acoustic neuroma, also known as a vestibular schwannoma, is a cranial nerve tumour which is benign (non-cancerous) and, in most cases, slow growing. The cells that form an acoustic neuroma are called schwann cells. Unknown events lead to an overproduction of them and as they multiply they form a small tumour which fills the canal that connects the inner ear to the brain. This pear shape tumour puts pressure on the nerves and the brain. The symptoms of an acoustic neuroma are generally hearing loss, difficulty with balance or tinnitus.

What is gamma knife surgery?

Gamma knife radiosurgery uses a beam of radiation to treat conditions affecting the brain, head and neck. It does not use a knife but is a non-invasive treatment that does not need any skin incision.

The benefits of gamma knife radiosurgery

The accuracy of the gamma knife radiosurgery system enables a high dose of radiation to be focused on a very precise area. This means one treatment is generally all that is needed.

One of the major benefits of gamma knife radiosurgery is that it is non-invasive. Other benefits include the following:

- There is no incision. This means you won't need to shave your head and you'll have no scars to heal. It also avoids the risks that can be associated with open surgery, such as bleeding and infection.
- You're unlikely to have hair loss or nausea.
- The procedure is relatively painless and in most cases a general anaesthetic isn't needed.
- We find that most people get back to their normal activities in a day or two (compared to two to six weeks recovery time with conventional brain surgery).

Gamma knife radiosurgery usually has minimum complications. Indirect comparisons suggest it produces fewer complications than other treatment techniques.

What are the alternatives to gamma knife radiosurgery?

Depending on your general health and the size and position of your acoustic neuroma, the main alternatives are observation (waiting to see what happens) and conventional surgery. Your doctor will discuss the relative benefits of these with you.

About the gamma knife procedure

There are several steps to the procedure but these will all be done in one day. Generally you will be admitted to the hospital the night before or on the morning of your gamma knife radiosurgery. You will be asked not to eat or drink anything for four hours before your procedure (unless you have diabetes). You will also be asked to wash your hair. You may be given medicine to help you to relax.

Before the surgery can take place, you'll have a lightweight head frame fitted. This is used to pinpoint the area to be treated by the gamma knife. A local anaesthetic will be injected in four places into your scalp where the frame will be fixed with screws. These injections may be painful but will only last for a few seconds. The frame will stay attached to your head for the whole procedure.

To find the exact position of the area that needs to be treated, you will need to have a magnetic resonance imaging (MRI) scan. A neuro-radiologist (a doctor who specialises in using imaging methods on the brain), physicist and your doctor will plan the optimal dose of radiation and the most precise way of targeting it to the relevant area.

You will return to the gamma knife unit where you'll be carefully positioned on the couch so that your head remains completely still. The gamma knife procedure may involve one or several exposures to the radiation. The length of time this takes will depend on the size of your acoustic neuroma. You will be able to talk to our staff through a microphone in the gamma knife machine throughout the procedure.

Recovering from gamma knife radiosurgery

Once the procedure is finished, you will have the head frame removed and you can go back to rest in your room. When the frame is taken off you may have slight bleeding from the points where it was held in place. You may also feel sick or have a headache but this shouldn't last for more than a few hours. Most people stay overnight in the hospital after gamma knife radiosurgery. Depending on your general health, you should be able to get back to your normal activities the day after treatment.

Follow-up

The aim of gamma knife surgery for an acoustic neuroma is to stop further growth of the tumour. In some cases the acoustic neuroma shrinks slightly after the procedure but the outcome can be positive even if this doesn't happen. The majority of small to moderate size acoustic tumours do not need any further treatment after gamma knife surgery.

Your doctor will give you details but it is usual to have a follow-up appointment, with an MRI scan, at one, two, three, five, seven and ten years after gamma knife surgery.

What are the risks?

As with every procedure, there are some risks associated with gamma knife radiosurgery. In order to make an informed decision and give your consent, you need to be aware of the possible side effects of this procedure.

Gamma knife treatment can sometimes increase the size of the tumour. This is a temporary reaction and is a sign that the procedure is working. It usually occurs about six to twelve months after treatment but can appear up to two years later.

Hearing loss is a natural feature of acoustic neuromas and the aim of gamma knife surgery is to prevent this loss. Two published studies give evidence that gamma knife surgery is successful in preserving the hearing of 60-70% of people who have hearing prior to the treatment. This is significantly better than the outcome among those who do not have treatment. However, these results also mean that for 30-40% of people a deterioration in hearing cannot be avoided despite gamma knife surgery. This is unavoidable due to the way in which acoustic neuromas naturally develop; it is not a result of any complications from the gamma knife radiosurgery.

The tumour may be in close proximity to other cranial nerves. There is a very small risk of facial weakness, facial numbness or temporary balance problems.

Any exposure to radiation (as in gamma knife surgery) carries the small risk of a malignant tumour developing in the future.

Your doctor will talk to you about the potential risks and side effects of gamma knife surgery for your individual circumstances. If your doctor recommends that your tumour is treated with gamma knife surgery, this will be based on the judgement that it carries lower risks than conventional surgery or alternative therapies.

Contact

If you have any questions or need further information, please contact your doctor, or the gamma knife centre Monday to Friday, between 9.00am and 5.30pm.

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Further information

British Acoustic Neuroma Association (BANA) provides information and support for people diagnosed with acoustic neuromas.

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