Radiosurgery for brain metastases

Information for patients
Stereotactic Radiosurgery
What are brain metastases?

In some forms of cancer the disease can spread from the original site of the tumour. The place in which the cancer first starts is known as the primary site and this tumour is referred to as the primary tumour.

Cells are able to break away from the primary tumour and be carried in the blood. These are then deposited in another area of the body where they grow and form another tumour. These tumours are referred to as secondary tumours or metastases. These secondary tumours may be described as being solitary i.e. one only, or multiple where there are two or more.

The most common types of cancers that can spread to the brain originate in the lung, breast, colon, skin and kidney. The symptoms you have been experiencing will depend upon which area of the brain is affected by the secondary tumour.

You may have many different emotions including anxiety and fear. These are all normal reactions and are part of the process that many people go through in trying to come to terms with their condition.

What are the treatment options for brain metastases?

There are several treatment options, any of which may be appropriate for individual patients. Your case may have been discussed at a multidisciplinary meeting to ensure the best possible combination of treatment options. The appropriate options may have been considered and discussed with you by the clinician involved in the management of your primary disease before your referral for stereotactic radiosurgery.
They may include one or more of these possible options:

- **Surgery** - This involves an operation often under general anaesthetic and up to ten days or more can be spent in hospital. Surgical removal may be possible and may have been discussed with you already. The risks of this surgery will be explained to you and will depend on the precise position of your tumour.

- **Steroid therapy** - Steroid therapy can sometimes be used as part of the management of brain metastases. Steroids reduce inflammation which can provide temporary relief from symptoms associated with swelling.

- **Conventional radiotherapy** - Conventional radiotherapy takes place in a cancer hospital using high-energy x-rays. Treatments are carried out daily and can take up to 20 minutes per appointment. Patients commute daily for radiotherapy which may take place Monday to Friday over several days or weeks.

- **Stereotactic radiosurgery** - This is a specialist technique available in Sheffield which is usually carried out under local anaesthetic which means you will be awake throughout the whole treatment process. This will be discussed further in this information leaflet.

**Treatment with Gamma Knife radiosurgery**

This is not a knife in the conventional sense and the treatment does not involve anything being cut.

During treatment a high dose of radiation is delivered to the metastases.
How does the Gamma Knife work?

Gamma Knife PFX - Royal Hallamshire Hospital

The Gamma Knife works by focusing beams of gamma radiation on the target area. It has the ability to treat a very tightly defined target area without affecting any surrounding tissue.

Gamma Knife surgery is used exclusively for the brain, head and neck.

How successful is treatment?

Due to its highly focussed nature, radiosurgery is generally effective at controlling the local disease being treated.

However, because it is so focussed it will not affect any cancer elsewhere in the body. In practice it is what is going on at other sites in the body that will determine how well you do.

You will have had staging examinations to assess this and as a rule we offer radiosurgery only to patients in whom the disease elsewhere in the body is controlled or controllable.

Here at Sheffield we have treated over 1750 patients with brain metastases.
How many times do I have to come to Sheffield?

It is usual to offer an outpatient appointment for everyone referred to us. You may have had some of your questions answered by your referring consultant. You may also have had information from other sources (GP, internet, other patients etc) which may need to be put into context. Indeed you may have had contact with our office and received some answers from our staff. Most patients find it worthwhile to come and see one of our consultants and other members of the treatment team.

As with any procedure we must seek your consent beforehand. Your consultant will always explain the risks, benefits and alternatives where relevant before they ask for your consent. If you are unsure about any aspect of the procedure or treatment proposed, please do not hesitate to ask for more information, we are always happy to help.

When you are ready to go ahead we would then plan an admission for treatment which may involve up to a two night stay in Sheffield. Your accommodation will be discussed at your consultation with the radiographer.

When do I have to arrive at the ward?

You will be advised to arrive at the admission ward around midday. You will receive in the information pack a list of nearby hotels, bed and breakfast accommodation, etc.

What will happen on that day?

You will be received by a nurse who will show you around the ward. In the afternoon you will meet with the radiosurgery team who will take your history, check you for general medical problems (if this was not completed at your outpatient appointment) and will prescribe any additional medication necessary.
Some radiosurgery patients are prescribed a short course of Dexamethasone (steroid) and Ranitidine (antacid); you may already be on these medications. These will be fully explained to you when you attend. We are aware that some patients may already be on these medications prior to attending. It is usual for patients to continue with their own medication whilst undergoing radiosurgery. We may also require blood tests in preparation for treatment day.

You will have a chance to meet the therapy radiographer, who will go over the procedure with you. You may also see the medical staff (if necessary) who can give further information about the procedure, and answer any questions you may have. He / She would also ask you to sign your consent form if you did not already complete this at your outpatient appointment.

**What will happen on treatment day?**

We need to target the tumour precisely. In order to guide us, we use a metal frame as a reference. On the morning of the treatment, one of the medical staff will apply the frame.

This involves giving you four local anaesthetic injections into your scalp (two in the forehead and two in the back). When the area feels numb, four screws will be tightened to hold the frame rigidly to the skull. This causes pressure but this feeling wears off after a few minutes. There is no drilling involved and we do not remove any hair.

You will have the frame attached for the rest of the day, as all measurements are taken from this reference.

You will be taken to the MRI scanner to have images taken. You may be familiar with these from your previous hospital visits.

Even though you have been provisionally accepted for radiosurgery, you should be aware that it may be necessary for treatment decisions to be
changed on the day if your clinical condition has altered or the number of tumours found on the MRI imaging has increased significantly.

If radiosurgery is still appropriate, the next step is for the radiographer to take you to the Gamma Knife. There you will wait for the treatment plan to be ready. This may take an hour or two. When the plan is completed, the radiographers will carry out the treatment.

You are welcome to have a family member with you all day if this would make you feel more comfortable.

**Can the treatment 'miss' its target?**

No. There are many safety measures in place which ensure that the tumour is precisely targeted. The frame is the single most important part in ensuring this happens.

**What do I feel during the treatment?**

The frame, which at this point will still be attached to your head, will be positioned and fixed within the Gamma Knife.

For you the treatment will be similar to having another scan. You will lie on a couch, listen to music and will feel no pain.

Claustrophobic patients may find the confined space difficult but the space is less confined than the MRI scanner. We have an intercom system so it is possible to talk to the radiographers at any time.

**What happens after?**

We will remove the frame, clean the points where it was attached and take you up to the ward. You may feel tired or even have a headache that afternoon, as a result of the frame application and the long and busy day. You will not be able to wash your hair for 3 days following the treatment. In the morning if you stayed in hospital you will be visited by a member of the team and discharged home.
Your follow-up will be carried out by the oncologist who referred you to us.

The consultants in the radiosurgical unit will continue to advise on the management of your case and we remain interested in your progress.

Research

As a centre with over 30 years' experience treating many rare conditions, we regularly carry out clinical audit, service evaluation and research projects. The information we gather in these exercises helps to build on our understanding of radiosurgery and allow us to better inform both you and future patients and may improve our service and treatment. The use of anonymised data about your treatment and follow-up may be used in these activities. If you wish to opt out of us using your anonymised data in this way, please tell a member of the radiosurgical team when you see us at clinic. They will record this on your records and it will in no way affect the treatment or follow-up that you receive from us.

Are there any side effects and complications?

Side effects can vary greatly between individuals and the consultant will discuss these with you in more detail when you are seen in clinic.

Apart from the effects of the local anaesthetic used for the frame application most patients will have no immediate side effects. You may have a headache by the end of the long day of treatment, mainly due to the frame.

In theory with any radiosurgical treatment there is a small risk of swelling or reaction in the brain. This occurs around 3-6 months after treatment and typically lasts for a limited period of time, up to 3 months approximately. We would normally put the risk of such a delayed radiation reaction at less than 5%. Against this however, if the cancer is not controlled it will progress and cause the same problems.
The reaction or swelling may cause symptoms which are dependent on the location and size of the treated area. Symptoms may include blurring of vision, weakness/numbness in a limb or side of face etc. These will be discussed in further detail at your clinic appointment if they are relevant to you.

If these symptoms become problematic we may advise treatment with a cortico-steroid for a period of time. Cortico-steroids can have side effects which may be described as distressing and long term use should be avoided.

**Will I lose my hair?**

No hair is shaved for the treatment. Hair loss is very uncommon after radiosurgery but occasionally a small patch of hair can be lost if the tumour being treated is immediately under the scalp.

**Will I take any tablets?**

You will normally continue your usual medication; please bring all your own medication into hospital with you. You will not generally need to take home new medication but you will have to continue with the tablets you may have been taking when you came in. During your stay, you may also receive Dexamethasone, if you are not already taking it. This is a steroid used to add extra protection to the brain during treatment and is normally combined with an antacid, Ranitidine. If you were already taking Dexamethasone, your oncologist will need to advise on what dose you should continue to take after your radiosurgical treatment.
Frequently asked questions

Q. Will I be radioactive after the treatment?
A. No. When the machine is switched off after your treatment is completed the radiation stops and does not linger in your body.

Q. Will I be able to drive immediately after my treatment?
A. Your referring doctor should have discussed driving restrictions with you already, if this is not the case please make sure you discuss this with them at your earliest convenience. There will be at least a 1 year restriction on driving following radiosurgery, after which the DVLA may allow you to return to driving. You are advised to notify the DVLA about your condition and treatment immediately. If you have a Group 2 (Bus/Lorry) licence you will need to contact DVLA for further advice.

For further information:

Refer to our web site:

- www.gammaknife.org.uk

Email us at:

- Gamma.Knife@nhs.net

Contact the self-help group:

- Macmillan Cancer Support
- 0808 808 0000
- www.macmillan.org.uk
Please use this space to jot down any questions you may have for the consultant when you come to the clinic.