Patient information factsheet

Image-guided biopsy for a brain tumour

We've given you this factsheet because you are due to have an image-guided biopsy. This operation helps us to diagnose tumours in the brain.

We hope this factsheet will help to answer some of the questions you may have.

What is an image-guided biopsy?

A biopsy is an operation in which we pass a needle into a tumour to take small samples. We can then send the samples for analysis to determine a precise diagnosis.

An 'image-guided' biopsy is when we take scans of the brain so that we can precisely locate and target a lesion (damaged area) in the brain.

In the past, this was often done by fixing a metal frame to the head with pins and carrying out a (CT or MRI) scan with the frame on (frame-based stereotaxy).

Nowadays we can perform your scan as a separate procedure (without a frame on) before your biopsy operation. We can then upload the data onto a computer in the operating room and use a navigation system to locate the tumour. This is known as frameless stereotaxy or image-guidance.

Why do I need a biopsy?

We usually perform a biopsy because your previous scans have shown a lesion in the brain. Unfortunately, these previous scans are only about 60 to 70% reliable in diagnosing different types of lesion within the brain. We need to do a biopsy to be certain of the diagnosis so that we can plan the best treatment for you and give you more accurate information on your prognosis.

What happens in the biospy operation?

You do not usually need to have a general anaesthetic for the biopsy. We will give you some sedation so you are relaxed and comfortable.

In the operating theatre you will be positioned on an operating table and your head will be supported on a headrest. We will use a neuronavigation system (like a satellite navigation system) and your scan data from before the operation to precisely locate the site for the biopsy (target) and to determine an entry point. This point can then be marked on the scalp.

A small incision can then be marked on the scalp and a very small amount of hair can be shaved along the line of the incision. The area can then be cleaned with antiseptic solutions and surrounded by surgical drapes. A small injection of local anaesthetic is used to numb the incision site. This stings for a few seconds only. Nothing else should hurt at all.

An incision is then made and a special drill is used to create a burr hole approximately 14mm in diameter. This is a bit noisy for a few seconds. A small device is then screwed to the bone edges to hold the biopsy needle in position. Using the navigation system, the trajectory for the biopsy needle is planned and the biopsy needle is then passed into the tumour and a series of biopsies are taken. The wound is then closed with stitches and staples for the skin.

What happens after the biopsy operation?

You will be transferred to the recovery area for a short time and then to the neurosurgery day case unit where we will observe you regularly. This will include an assessment of your conscious level (asking you to follow simple commands, opening your eyes and answering questions), examination of your pupil responses, tests of your limb strength and checks on your pulse, blood pressure and respirations. After four hours you will have a CT scan of the head. You will be able to leave after about six hours (either to go home or to go back to your local hospital). Occasionally it is necessary to stay in for longer.

A biopsy is not particularly painful but you will be given some tablets for any headaches. If you feel nausea we will give you drugs to relieve this symptom. You will often be given steroids to prevent swelling (in a slowly reducing dose) and anti-epileptic drugs to prevent fits in the early period after the operation. You can eat, drink and mobilise as soon as you feel able to, which is usually within a few hours of the operation.

What happens after I leave hospital?

Your surgeon will arrange an appointment with you to discuss the results of the biopsy, usually the week after the operation. The staples can usually be removed from your wound at this appointment. After this you can wash your hair. Your surgeon will also explain to you any plans for further treatment and follow-up.

You may have some mild headaches, which will lessen with time and you may feel tired and need to rest at home. If you are taking steroids, the dose will slowly be reduced, as prescribed by your surgeon. If you have not had any fits your anticonvulsants will be stopped, as directed by your surgeon.

You will not be able to drive for a time determined by your symptoms and diagnosis. You should inform the DVLA of your diagnosis and give them the name of your treating surgeon by calling 087 0240 0009. They will send a form to your surgeon for them to complete and will then inform you of the date on which you may return to driving.

For further information, the DVLA's guidelines are published online at www.dvla.gov.uk/welcome.htm

Because of the small risk of a fit, you should also avoid any other activities that may put you at risk if you were to suffer a brief loss of consciousness, such as, climbing ladders, operating certain machinery or swimming unsupervised.

What are the risks of a biopsy for a brain tumour?

Every operation carries a risk. Overall, complications after a biopsy are rare and the degree of risk depends on a number of factors, such as the location and type of the tumour, your general medical health, and your age. Your surgeon will explain to you the particular risks associated with your operation and give you an indication of the likely chance of complications occurring.

Complications include, but are not exclusive to:,

- temporary or permanent neurological deficit (stroke, such as paralysis of limbs or loss of speech)
- haematoma (blood clot)
- brain swelling
- infection
- fits

Some of these complications might be serious enough to warrant further surgery and some can be life threatening. Overall, as a general guide, the incidence of serious complications causing severe permanent neurological deficit (stroke) or death is about 1%.

Does the biopsy always give a diagnosis?

Very occasionally the tiny samples of tissue will not be sufficient to give a definite diagnosis and we may need to repeat the operation. This happens to about 1% of patients, so there is a 99% chance that the operation will give a diagnosis.

Some primary brain tumours may not be the same all the way through, so there is a chance that a small biopsy may not be fully representative of the whole tumour. This could lead to the tumour being incorrectly graded (too low). We try to avoid this sampling error by taking several biopsies from different locations from the tumour and by targeting the most abnormal areas on the scan.

Will my symptoms improve?

No. The aim of the operation is to obtain a diagnosis so that we can plan your future treatment and give you an indication of your prognosis.

What should I look out for after the operation?

Contact your doctor if you experience:

- headaches that get progressively worse
- persistent vomiting
- fitting
- fever
- wound problems (increasing pain, swelling, discharge)
- development of new or worsening symptoms (such as weakness or numbness,)
- increasing drowsiness
- rash

If you are at home you could discuss your symptoms with your GP, call your neuro-oncology specialist nurse (if you have one) or contact your surgeon and their team at the hospital.

There is a neurosurgical specialist on duty at all times to deal with emergencies:

Neurosurgical specialist
Telephone: 02380 777222
Bleep: 2877

If you need a translation of this document, an interpreter or a version in large print, Braille or on audio tape, please telephone 023 8120 4688 for help.

Version 1. Reviewed October 2018. Due for review October 2021. 2130