Patient information factsheet

Awake craniotomy

An awake craniotomy is an operation performed in the same manner as a conventional craniotomy (please see the Craniotomy for brain tumour removal factsheet), but with the patient awake during the procedure.

This is a preferred technique for operations to remove tumours close to, or involving functionally important (eloquent) regions of the brain. Performing the operation in this way allows us to test regions of the brain before they are incised or removed and also to test the patient's function continuously throughout the operation. The overall aim is to minimise the risks of the operation.

How is an awake craniotomy performed?

There are different techniques but the one that's most commonly used is described here.

In the anaesthetic room you will have a drip inserted through which we'll give you some drugs to make you feel comfortable and relaxed.

In the operating theatre, the neuronavigation system will then be used to mark out where the incision (cut) will be. A very small amount of hair will be shaved along the line of the incision before it is cleaned with antiseptic solutions. Local anaesthetic will then be given around the incision. This will sting a little for a few seconds and then go numb.

We'll then place some drapes around the area but you will be able to see the anaesthetic team and talk to them, and to move your arms and legs freely during the operation.

As the operation continues you will hear some noises and, briefly, a drilling sound.

When the brain is exposed we will perform a procedure called cortical mapping. This involves stimulating the brain surface with a tiny electrical probe. If we stimulate a motor region of the brain it may cause twitching of a limb or your face; a sensory area will cause a tingling feeling; the speech areas will prevent you from speaking very briefly. By mapping out the important regions of the brain first we can aim to avoid and protect them during the operation. Whilst we remove the tumour we will continuously test your function, and if anything changes we will be able to stop.

This does not eliminate the risks of surgery but does likely reduce them.

After the tumour has been removed, all bleeding is stopped and the dura (thick membrane surrounding the brain) is closed with sutures. The bone flap is replaced with three mini-plates and the scalp is closed. The skin is then closed with staples and the wound is dressed and often a head bandage is applied.

What happens after surgery?

Post-operative recovery is generally much quicker than with a conventional craniotomy, as you will not have had a general anaesthetic. It's likely that you will only have a single drip and will not have any other lines or a catheter. You will be able to eat, drink and move around (mobilise) as soon as you feel able to, and it's likely you will be able to be discharged on the same day as your operation or the following day.

If you are having day-case surgery you will need a scan of your head four hours after surgery and could be discharged six hours after the operation, provided all is well. Otherwise you may have your scan the following morning and then be discharged, if all is well.

What happens after I'm discharged?

After any major operation it takes a few weeks to recover fully. For the first couple of weeks you may have some headaches that you should be able to control with simple painkillers that you will be given. You will feel more tired than usual and will need to rest when you feel tired. However, you should do a little more gentle exercise such as walking each day.

Your surgeon will usually arrange to see you in the outpatients clinic about five to seven days after surgery to check on your recovery and give you any results from biopsies from the operation. They will also advise you on your further care and answer any other questions that you have. Your clips or stitches will probably be removed in the clinic too.

Symptoms to notify your doctor of immediately:

- Headaches that are progressively worsening
- Fits
- Fever
- Wound problems (increasing pain, swelling, discharge)
- Development of new or worsening symptoms (such as weakness or numbness for example)
- Increasing drowsiness
- Rash

If you are at home you could discuss your symptoms with your GP, call your neuro-oncology specialist nurse or out-of-hours call the neurosurgery ward that you were discharged from. The on-call resident neurosurgeon is available for emergencies at all times on **023 8077 7222** bleep **2877**.

Risks and complications

The risks of awake surgery for a brain tumour are the same as those for conventional surgery, but there is also a small risk of seizures during surgery that might in rare circumstances require conversion to general anaesthetic.

Every operation carries a risk. Overall, complications following a craniotomy are uncommon and the degree of risk depends on a number of factors, for example, the size, location and type of the tumour, your general medical health and 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, the following:

- Temporary or permanent neurological deficit (stroke e.g. paralysis of limbs or loss of speech)
- Haematoma (blood clot)
- Brain swelling
- Infection
- Fits
- CSF leak (leakage of fluid from around the brain)
- General medical complications:
  - Deep vein thrombosis (clot in leg veins - DVT)
  - Pulmonary embolism (clot from legs passing to lungs - PE)
  - Pneumonia
  - Heart attack
  - Urinary tract infection (UTI)

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 permanent neurological deficit (stroke) or death is less than 5%.

Overall the risks of general complications of surgery, such as deep vein thrombosis and urinary or chest infection, are thought to occur less frequently because you will not have a general anaesthetic.

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