Patient information factsheet

Craniotomy for brain tumour removal

A craniotomy is an operation where a disc of bone is removed from the skull using special tools to allow access to the underlying brain.

This factsheet aims to explain what the operation involves, and to answer some of the initial questions you are likely to have. If you would like more information about anything discussed here, please speak to your doctor or a member of your healthcare team.

How is a craniotomy performed?

We will give you a general anaesthetic so that you'll be asleep during the operation. Your doctor will discuss this with you in advance.

In the operating theatre you will be positioned on an operating table and your head will be held firmly by a special device featuring three pins that are placed onto the outer surface of the skull. A neuronavigation system (like a satellite navigation system) will be used together with your pre-operative scan to precisely locate the site of the tumour, which can then be marked on the scalp. An incision (cut) can then be marked and a very small amount of your hair will be shaved along the line of the incision. The area will then be cleaned with antiseptic solutions and surrounded by surgical drapes.

The skull will be exposed by making an incision in the scalp and a high-speed drill will then be used to make a small burr hole through the skull to reveal the underlying dura (thick membrane surrounding the brain). A special drill (craniotome) is then used to cut a disc of bone (bone flap), which is removed from the dura. The dura can then be incised to reveal the underlying brain (and tumour). If the tumour lies on the surface of the brain (as with a meningioma) it will be carefully separated from the brain and removed. If the tumour is inside the brain, we'll make a cut in the surface of the brain substance down to the surface of the tumour so that we can remove it.

Some tumours (meningiomas, for example) may be able to be removed in their entirety. For many intrinsic tumours (gliomas, for example) the surgeon will aim to remove as much of it as they safely can. In this case, there will inevitably be microscopic remnants of the tumour left in the surrounding brain.

After the tumour has been removed all bleeding is stopped and the dura is closed with sutures. The bone flap is replaced with three mini-plates and the scalp is closed with staples. The wound is then dressed and sometimes a head bandage is applied.

What happens after surgery?

You will be transferred to the recovery area for approximately one hour and then to the neurosurgery ward where observations will be performed regularly. These will include an assessment of your conscious level (asking you to follow simple commands, open your eyes and answer questions), examination of your pupil responses, tests of your limb strength and checks on your pulse, blood pressure and respirations.

It's possible that you will have a head bandage on which will be removed after a day or two. You will wear

anti-embolism stockings (AES) and have a drip in your arm, and occasionally a catheter in your bladder. Operations on the head are not particularly painful but you will be given some tablets or injections for the headaches. If you feel sick (nausea) you will be given drugs to relieve this. You will often be given steroids to prevent swelling (in a slowly reducing dose). You may eat, drink and move around (mobilise) as soon as you feel able to.

To reduce the chance of developing a deep vein thrombosis (DVT) in your legs, you will also be encouraged to mobilise and, as well as wearing the AES, you may be given injections of enoxaparin (an anticoagulant medicine) daily, commencing 24 hours after surgery if you are still in hospital. You should keep your AES on for about two weeks after discharge or until your mobility has returned to what is normal for you.

You will be discharged from the neurosurgical centre as soon as your condition is stable. Many patients are able to go home as soon as they are comfortable and no longer need nursing care. If you require ongoing medical treatment or support you may be transferred back to your local hospital for further care.

What happens after I'm discharged?

Your surgeon will arrange an appointment with you to discuss the results of the biopsies sent from your operation, usually five to seven days after surgery. The staples can be removed from your wound after five days for a first operation or later for a "re-do" operation. Your surgeon will also explain to you any plans for further treatment and follow-up.

You may have some headaches, which will lessen with time, and you will feel tired and need to rest at home. If you are taking steroids, the dose will slowly be reduced, as prescribed by your surgeon.

Driving after surgery

You will not be able to drive for a time determined by your symptoms, diagnosis and treatment. You should inform the DVLA of your diagnosis by calling 0300 790 6806 and give them the name of the surgeon treating you. 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.

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)
- 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. The on-call resident neurosurgeon is available for emergencies at all times on **023 8077 7222** bleep **2877**.

Risks and complications

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

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 usually less than 5%.

Will my symptoms improve?

This will depend on the tumour and the surgery. If the tumour has been causing headaches, there is a good chance these will improve following surgery. If you had weakness or paralysis in a limb caused by pressure on the brain by a tumour, then this may improve following surgery. However, if you had weakness caused by invasion of the tumour into the brain then it is unlikely that this will improve following surgery. Seizures are sometimes improved by removal of a tumour but may not change or may occasionally worsen.

University Hospital Southampton NHS Foundation Trust
Tremona Road
Southampton
Hampshire
SO16 6YD

Main switchboard telephone: **023 8077 7222**

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