MELBOURNE NEUROSURGERY

SURGICAL PROCEDURE
INFORMATION

Prepared
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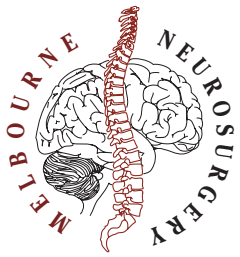
STEREOTACTIC POSTERIOR FOSSA CRANIOTOMY FOR CEREBELLAR METASTASIS



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WHAT IS A METASTASIS?

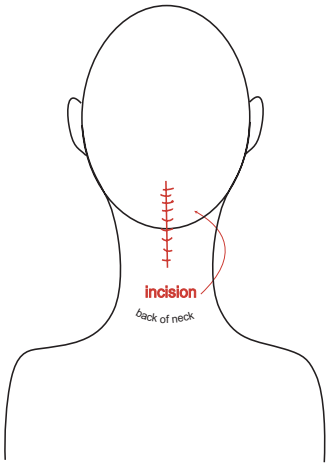
A Cerebellar Metastasis is a tumour in the brain that has come froma tumour somewhere else in the body.
It has usually spread by the blood stream to the brain. There may be the only one lesion or there may be more than one. An M.R.I. is usually done to find out if there are more lesions.

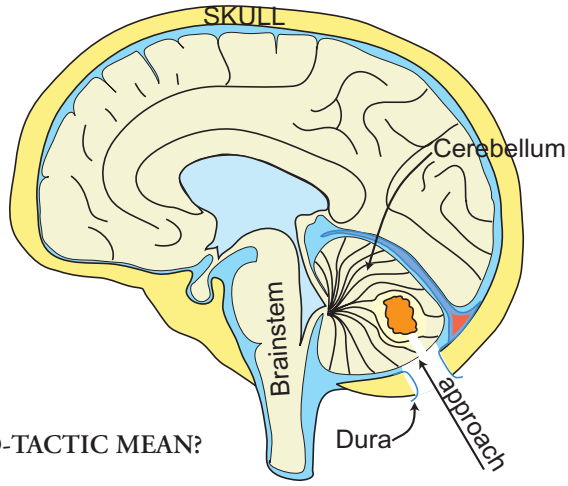
WHAT AND WHERE IS THE POSTERIOR FOSSA

This is the name of the compartment at the back of the skull that houses the cerebellumand the brainstem. The cerebellum is responsible for your co-ordination and balance. It is a smaller part of the brain than the cerebrum that sits above it.

WHAT IS A CRANIOTOMY?

This is where a disc of bone is removed from the skull with a special tool to allow access to the brain. A scalp flap is opened before this and the lining of the brain opened after. Everything is put back together at the end of the operation





WHAT DOES STEREO-TACTIC MEAN?

This is when a computer and associated equipment is used to help locate the lesion inside the brain. A CAT scan or MRI scan is performed before the surgery and this information is fed into a computer that is used during the surgery. The computer can have accuracy down to one millimeter. This is routinely used for most brain surgery.

WHAT ARE THE REASONS FOR THE SURGERY?

The commonest reason is the lesion is producing significant pressure on the brain or important structures within the brain. Part of the brain is not working or that the lesion is so large that it is compressing the brain to produce drowsiness. If it is not removed it can increase in size to produce death.

The lesion looks like a type of tumour and it is felt the best therapy is to remove it.

The lesion on the CT or MRI looks like a tumour and the operation is being done to find out if it is a tumour or infection. If the tumour is so large that you are drowsy or unconscious then a relative will be contacted to give consent for the procedure.

IF YOU HAVE MULTIPLE LESIONS CAN THEY ALL BE REMOVED ?

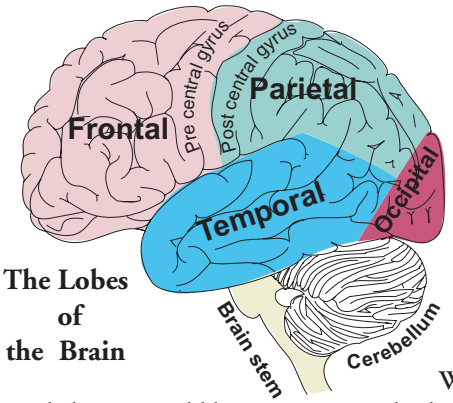
This depends on the number and location of the lesions. If the lesions are next to one another then this may be possible. If they are on opposite sides of the brain then we tend to remove them on separate occasions. If there are many lesions we may only remove the lesion that is causing you problems. In most cases if there are more than 3 lesion then it is unlikely that the can be treated with surgery alone.

IF I HAVE ONE LESION WILL IT BE ABLE TO BE REMOVED COMPLETELY?

There is always a balance between the risks of removing the lesion and doing harm.
If at the time of surgery the lesion involves a major vessel or other important structure we need to make a decision at the time as to the effect that removing this may have. If this is not felt safe then some may need to be left behind.
If the lining of the brain is involved then we may not be able to completely cure the lesion.
Sometimes the lesion looks just like your normal brain and we cannot tell what is abnormal. We would remove what is safe and may plan to come back later if the postoperative images show residual disease.
Lesions can be of 2 types. One is like the yellow of a hardboiled egg and is easy to distinguish and to separate from the surrounding brain. The other is like an octopus with a head that is easily distinguished from the brain but tentacles extending into normal brain. The head can be excised but the attempted removal of the tentacles means damaging the brain.
The texture of the lesion may dictate if it can be totally removed. If it is solid this means complete removal is more likely. If the lesion is cystic the wall of the cyst is the part that needs to be removed and this may not be possible. If the lesion is in an area of the brain that we can take a small rim if brain with the tumour complete removal is more likely. If the lesion is in an area that is very important (e.g. brainstem) and we cannot take a margin of brain without producing a stroke then the chance of leaving some behind is higher.

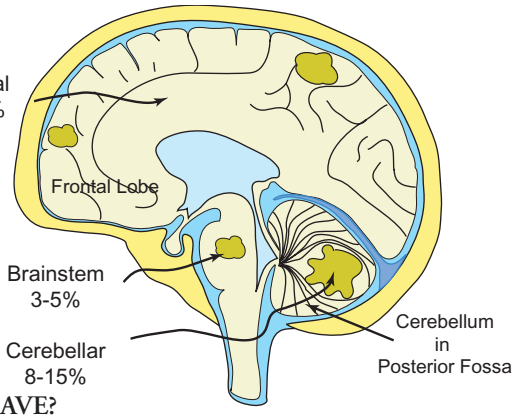
WHAT WILL HAPPEN IF I DO NOT HAVE THE SURGERY?

If the lesion grows it will produce a worsening of your symptoms and may eventually lead to death. The exact local effect of the lesion depends on where it is inside the head. Lesions in the area of the brain called the posterior fossa have a greater tendency to deteriorate rapidly. Those in the other areas of the brain cause local affects. The temporal lobe may cause problems with speech or memory. The frontal lobe may cause weakness or confusion (see picture).



The Lobes of the Brain

Midline section of the brain



WHAT OTHER CHOICES DO I HAVE?

The usual choices would be stereotactic radiotherapy or whole brain irradiation. Commonly you will have whole brain irradiation after the surgery. Whole brain radiation can usually only be given once. You may have already have had this. If we need to know what the lesion is then a needle biopsy alone may be an option.

HOW LONG DO I HAVE TO DECIDE?

This will depend on how big the lesion is or what it may be pressing on. Generally the smaller the lesion the less parts of the brain it will involve and the easier it will be to remove it all. Sometimes the surgery will need to be done urgently as the pressure has built up to a point where it is immediately life threatening.

WILL THE BRAIN BE DAMAGED IN REMOVING THE LESION And COULD I BE WORSE OFF FROM THE SURGERY??

The aim in all brain surgery is to do no harm. We plan the approach to the lesion so as not to affect anything. If the lesion is in that part of the brain that is critical for something then your symptoms may be made worse. Sometimes this will be permanent and other times they will get better over time. If a vessel needs to be taken at the time of surgery it may have no affect at all but could also produce a stroke that may not recover. Retraction of the brain may stop it working for a short time or produce a permanant stroke. There is a small chance that you may be severely damaged by the surgery. You may not wake up after the surgery or loose your sense of self (loss of personality). There is a small chance you could die from the surgery.

WHAT IS THE RISK OF A BLOOD CLOT POST-OPERATIVLEY?

We stop all the bleeding at the time of the surgery but it can restart. If this is going to happen it will happen in the first 6-12 hours post-operatively and we do special observations to keep an eye on this. If this happens then we may need to take you back to theatre to remove this. Any worsening of your symptoms usually will improve but they may not. Some patient can die from a sudden hemorrhage into the brain.

IS THERE A CHANCE THE LESION MAY COME BACK?

Yes. At the end of the surgery we will tell you how it went and how much could be removed. If some is left behind the lesion will probably recur but we will give you either whole brain radiation or stereotactic radiosurgery to try and prevent this. Even if we feel that it has been completely removed there is still a small chance it may recur.

COULD OTHER LESIONS OCCUR LATER?

Yes. Your original images may not have shown a very small lesion that may only be a few cells in size. We commonly give the radiotherapy to treat these after the surgery. This may grow but we will monitor you with scans to watch for these. If you have a tumour elsewhere that is shedding cells another lesion may spread to the brain.

CAN I DEVELOP EPILEPSY?

You may already have had a seizure that led us to find the lesion in the first place. If not there is a risk of developing seizures after the surgery. The risk of having a seizure directly related to the cerebellar lesion is very small as this part of the brain does not usually cause epilepsy. We will not routinely place you on medication unless you are in the high risk group with a lesion in another location. If you do have a seizure after the surgery someone should call an ambulance and get them to take you to hospital. After that we will either re-adjust your medication or start you on the appropriate drugs. The seizures can nearly always be controlled with medication.

WILL MY SYMPTOMS GET BETTER?

This will depend on what is causing the effect of the lesion. If the symptoms are because the brain is damaged by the lesion then improvement is unlikely. If the symptoms are from pressure then they should get better.

WHAT BENEFITS CAN I EXPECT FROM THE SURGERY?

The aims of the surgery are to:
Cure of your cranial disease if possible
Remove as much of the lesion as possible (hopefully all)
To make the lesion small enough for radiosurgery if we are not able to completely remove it.
Remove any compression of the brain
Improve any symptoms that you may have (headache, weakness, walking difficulty etc)
Get a diagnosis if we do not know what the lesion is.
These may not be achievable

WILL THE SURGERY ALWAYS BE AS DESCRIBED?

No. At the time of the surgery if we encounter problems or if the surgery is felt to be too dangerous we may either change the procedure or abandon it. The most likely event would be that we only did a local biopsy rather than tried to remove the whole lesion.

COULD THE LESION SPREAD IF WE OPERATE ON IT?

This is very unusual. Certain types of lesion are more likely to do this. Most are very solid and means that this will not happen.

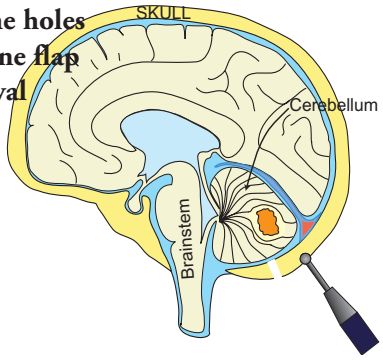
WHAT YOU NEED TO TELL THE DOCTOR BEFORE SURGERY?

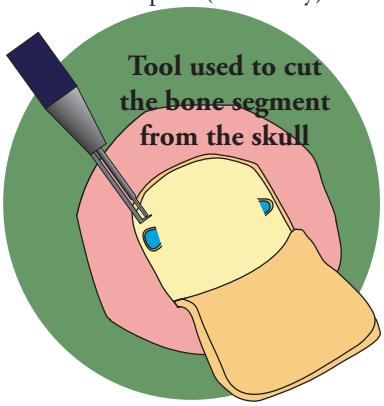
If you have clotting problems
Any recent new Health problems or heart disease
If you are taking blood thinning agents
e.g. Warfarin / aspirin/anti- inflammatory
If you have improved from the time you decided to have surgery.
Drug allergy
Any thing that you think is important for the doctor to know in making his decision to offer you surgery.

HOW IS THE OPERATION PERFORMED?

The surgery is performed in a hospital by a surgeon and he will most likely have a surgical assistant.
In the operating theatre you are given a general anaesthetic by the anaesthetist (an indwelling catheter may be needed) You are then positioned with the lesion uppermost. The head may be fixed in a special holder (this may leave 3 small pinholes in the scalp). The area of the incision is then shaved and prepared with anti-septic. You are covered in drapes so that only the incision can be seen. Local anaesthetic is injected and then the skin is cut. A hole in the bone is drilled down to the dura(lining of the brain) then a special drill cuts the disc of bone which is lifted off the dura. The dura is cut to expose the brain. A computer(stereotaxy) is often used to help locate the lesion in the brain.

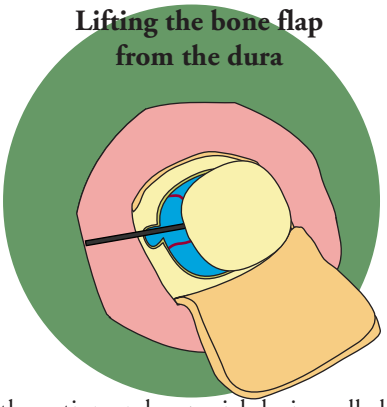
Drilling the holes for the bone flap removal



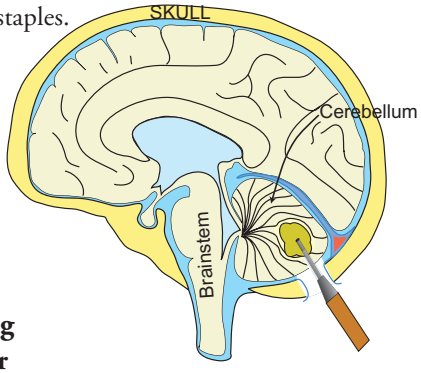


Tool used to cut the bone segment from the skull

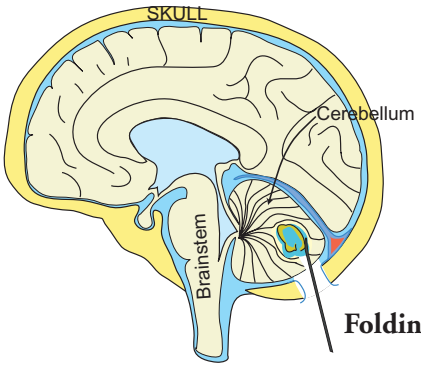
Lifting the bone flap from the dura



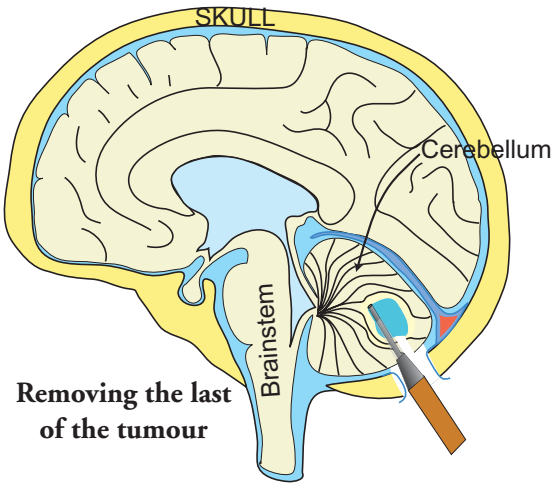
A small cut is made in the brain (~1 cm) and we dissect down to the lesion. It is then removed with suction and a special device called a CUSA. The CUSA breaks up the lesion so it can be removed through a small hole. Once the lesion is all removed all bleeding is stopped. We may line the cavity that the lesion has been removed from with a substance that encourages the blood to clot. The lining of the brain is then repaired with a fine suture. If this has been involved it may be replaced with a patch of either fascia from under your skin or a synthetic material. The lining may be sealed with a tissue glue to help prevent fluid leaks. The bone is plated back into position with titanium clips. The bone defect may be repaired with a synthetic material for cosmetic reasons or tumour involvement. The skin is then closed either with nylon suture or with special staples.



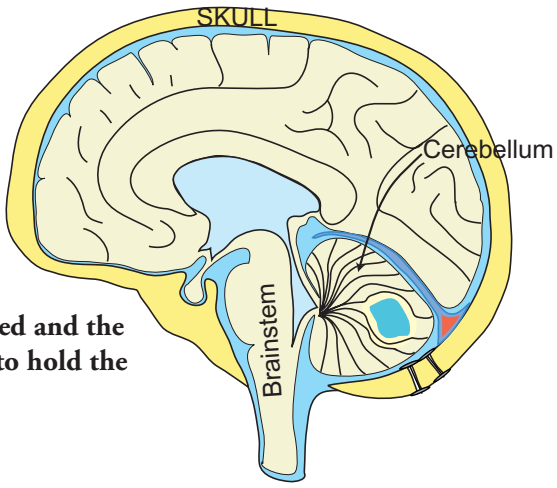
The CUSA removing some of the tumour



Folding the rest of the tumour into the cavity



Removing the last of the tumour



The dura is closed and the clips are placed to hold the bone

WHAT HAPPENS NEXT?

You will wake up in recovery and after about 1 hour you will be transferred to the ward. The nursing staff will be continually checking your pulse/blood pressure/limb strengths and level of alertness looking for any changes to indicate a complication. During the first night you will go to ICU and you will be woken for these observations. You will have either intravenous/intramuscular or oral analgesia. Operations on the head do not often hurt much.
Sometimes you will have difficulty passing water and you may require a catheter (this may have been inserted for the operation).

In the next day or so the drip in your arm will be removed. Usually this is the day after surgery. The day after surgery you will be encouraged to go for a walk. Gradually over the next two days you will be able to get around as normal. When you are comfortable you will be able to go home. You may have a repeat scan of your head before going home. Commonly you will have a headache for a while after the operation. The sutures are usually removed about 5 - 10 days after the surgery depending on if you have had previous radiotherapy in which case they can be left in for 14 days.

HOW LONG WILL YOU BE IN HOSPITAL?

Unless you have been admitted as an emergency you may be admitted on the day of surgery or the day before. You will fast from midnight on the day of surgery.
You will be discharged about 3-5 days post-operatively.
On discharge you will be able to perform most tasks of daily living (e.g. showering/dressing/etc.) Depending on how quickly you recover from any preoperative disability you may require rehabilitation.

WHAT TO NOTIFY YOUR DOCTOR OF AFTER SURGERY

Increasing Headache
Fever
Fitting
Swelling or infection in the wound
Fluid leaking from the wound
Weakness or numbness
Drowsiness
Leg pain or swelling
Difficulty breathing or chest pain

WHAT HAPPENS WHEN YOU GO HOME?

You will be tired
It is common to require a rest in the afternoon
You may have intermittent headaches.
These will all improve with time.

If you are taking steroids it will be reducing slowly
You may have appointments for some tests.
You will not be able to drive for 3 months.
Your post operatively will depend on what we find and if you need to have further tests or treatment. Most will be seen within 2 weeks.

WHEN WILL THE ANSWER BE KNOWN?

It may be known at the time of the surgery if we have sent a frozen section to the pathologist and he is sure of the answer. If he is not sure we will wait until the special stains are done and this will usually take a few days.

WHAT ARE SOME OFTHE RISKS?

Discuss these and any concerns with your surgeon

Some of the possible complications are:

Infection: Meningitis (treated with antibiotics)
Brain abscess (may need further surgery)
Bone flap infection (may need removal)
Wound infection (treated with antibiotics)

Post operative blood clot requiring drainage.
CSF (fluid from around the brain) leak from the wound
Brain Swelling and worsening of symptoms or death
Stroke (weakness/numbness/paralysis/death)
Dizzy / Headache loss of balance
Failure to wake up
Seizure
Death (rare)
Positioning injuries (pressure on a nerve or other body part)
Wound breakdown
Surgery on the wrong side or inability to find the lesion in the brain
Biopsy may be inaccurate or show normal tissue
Blindness
If you have a fluid collection in the brain you may require a shunt
There may be partial thinning of the bone under the flap
There may be thinning of the muscle under the incision
The holes used to gain access may get bigger
Numbness of the scalp may remain
Symptoms may be made worse
Further surgery may be required
Blood transfusion
Medical complications not related directly to the surgery

e.g. Clot in the legs (can travel to the lungs [uncommon])
Pneumonia
Heart attack
Urine infection
Kidney failure
Stroke
Drip or catheter infection

WHAT ARE THE COSTS OF THE SURGERY?

Discuss this with your surgeon

If you have private insurance there are no out of pocket costs for the surgery above the amount you will get back from your health fund unless this needs to be done as an emergency. It is important to discuss this with your doctor and to contact your fund to understand not only the cost of the surgeon but also the costs of the hospital admission and other people involved. The assistant will send an account for 20% of the value of the surgeons' fee.
If you have no health insurance and wish to have the surgery privately then you should discuss with the office staff to organize an estimate.

YOU WILL BE ASKED TO SIGN A CONSENT FORM TO SAY THAT YOU UNDERSTAND ANY RISKS.
IF YOU ARE NOT SURE ASK BEFORE YOU SIGN.
If you feel that you need a second opinion we recommend that you ask your local doctor to arrange an independent opinion for you.

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