Healthscope

Skull base tumours

If you or a loved one has been diagnosed with a skull base tumour, you want to know you're in expert hands. Our team of specialists use the most up-to-date technologies and procedures to provide advanced skull base tumour management.

What is a skull base tumour?

The skull base is the part of the skull your brain sits on. It is made up of five bones that separate the brain from the eyes, ears, sinuses and other parts of your head. The skull base has several openings for blood vessels and nerves (including the spinal cord) to travel through.

Skull base tumours are growths that develop along the base of the skull, or next to it in areas such as the sinuses. Many skull base tumours are not cancerous (benign) and slow-growing. Less commonly, a skull base tumour can be cancerous (malignant) and may migrate to other parts of the body.

Some tumours start in the base of the skull. These are known as primary skull base tumours. Others originate from a cancer somewhere else in the body, which spreads to become a metastatic tumour.

Types of skull base tumour

Skull base tumours can be classified by where they are and which tissue they started in. Here are some types of skull base tumours:

Meningiomas

These start in the protective membranes around the brain and spinal cord (the meninges). They are the most common type of skull base tumour. Meningiomas are typically benign and slow-growing but may cause symptoms due to their location and size.

Pituitary adenomas

These develop in the pituitary gland at the base of the brain. Because the pituitary gland is responsible for regulating hormone production, they can cause symptoms related to hormone function.

Schwannomas

These begin in cells that provide insulation for nerve pathways known as Schwann cells. Schwannomas commonly affect the cranial nerves – a set of nerves that start in the brain and travel through openings in the skull to the head, neck, chest, and abdomen. The cranial nerves carry messages between the brain and the sensory organs, muscles in the head and neck, and body organs including the heart, lungs, and digestive tract.

Chordomas

These rare tumours originate in remnants of an embryonic tissue known as the notochord. They usually occur in the middle of the skull base and tend to grow slowly.

Chondrosarcomas

These malignant tumours start in cartilage cells. Chondrosarcomas usually grow slowly but can spread to surrounding tissues.

Craniopharyngiomas

Also rare, craniopharyngiomas develop from remnants of an embryonic structure in the pituitary gland known as Rathke's pouch.

Olfactory neuroblastomas (esthesioneuroblastomas)

These rare malignant tumours start in the upper part of the nasal cavity and can spread into the skull base. Typical symptoms include a blocked nose, nosebleeds, and changes in sense of smell.

Hemangiopericytomas/solitary fibrous tumours

These rare tumours can occur in the skull base. They start in specialised cells surrounding blood vessels. They can be aggressive and tend to recur.

Glomus tumours (paragangliomas)

Glomus tumours begin in specialised cells called paraganglia. They commonly occur in the head and neck, including the skull base. Glomus tumours are usually benign but can cause symptoms due to their vascular nature and proximity to vital structures.

These are just a few examples. Each type of tumour of the skull base has unique characteristics, growth patterns, and potential complications. Your specialists will work with you to get an accurate diagnosis.

Skull base tumour symptoms

Many skull base tumours do not cause symptoms. Symptoms usually start because a tumour has grown big enough to put pressure on vital structures or is affecting hormone production.

Symptoms of a skull base tumour will depend on its location, type and size. They can include:

- headaches
- changes to your sense of smell
- breathing difficulties
- blurred or double vision
- trouble swallowing
- hoarse voice
- hearing loss
- balance problems
- nausea and vomiting
- weight loss
- hormone disruption
- memory loss.

What causes skull base tumours?

The cause of skull base tumours isn't fully understood. However, some things can raise your risk of developing one, including:

- previous radiation therapy to the brain, head, or neck
- exposure to some chemicals, such as arsenic and vinyl chloride
- some genetic conditions.

Skull base tumour prevention

Research is yet to discover what causes tumours at the base of the skull, so we don't know how to prevent them. Talk to your doctor if you have questions about your risk factors for a skull base tumour.

Referral for skull base tumour management

If you have symptoms of a skull base tumour, your GP might refer you to a neurologist or neurosurgeon for further investigations and treatment.

To start your treatment with us, ask your GP for a referral to one of our experienced neurological specialists.

Your doctor can address the referral to a specific specialist, or simply to 'Dear Doctor'.

If you are diagnosed with a skull base tumour, your treatment will typically involve a multidisciplinary approach and be managed by a team of healthcare professionals.

How are skull base tumours diagnosed?

If doctors think you may have a skull base tumour, they will do thorough assessment. The following tests can help you and your healthcare team get to the bottom of your symptoms.

Physical examination

Your doctor may do physical tests to see if a skull base tumour is affecting your physical function. For example, they might test your vision, hearing, muscle strength, and balance.

Blood tests

You might be referred for blood tests to check hormone levels.

MRI (magnetic resonance imaging)

An MRI scan uses a powerful magnet, radio waves and a computer to generate detailed, cross-sectional images of the tissues. MRI images can help doctors see the size, location, and type of the tumour, and whether it has spread.

CT (computerised tomography) scan

This test uses X-rays to take multiple images of an area, which a computer puts together to provide detailed pictures. CT scans are often used in conjunction with an MRI to provide more information about the tumour and surrounding structures. CT scans may also be used to guide biopsies or treatment.

PET scan

This test involves injecting a small amount of radioactive dye that causes tumour cells to show up on the scan. PET scans can help determine a tumour's aggressiveness, see whether it has spread, and assess response to treatment.

Angiogram

This specialised imaging technique involves injecting a contrast material into the blood vessels to show the blood supply to the tumour. It provides detailed images of the arteries and veins, helping doctors see things like blood vessel abnormalities and which arteries are supplying the tumour.

Biopsy

This test involves taking a sample of tumour tissue and testing it in a laboratory.

The choice of tests depends on several factors, including the suspected type of skull base tumour, your symptoms, and what information specialists need to plan treatment. In many cases, a combination of imaging tests is helpful. Your specialists will decide on the most appropriate assessment strategy for your situation.

How are skull base tumours treated?

Treatment for a skull base tumour will depend on various things, including the type, location and size of the tumour, its grade and stage, and your age and general health. The goal is to provide the best outcome with minimal side effects.

Treating skull base tumours can be challenging because they are often located deep in the skull and close to vital nerves and blood vessels. Your specialist will talk to you and your loved ones about the options and help you decide on the best course of action.

Treatment often involves a combination of approaches delivered by a team of healthcare professionals, including neurosurgeons, head and neck surgeons, ENT surgeons, radiation oncologists, and medical oncologists.

Here are the common treatment options for skull base tumours.

Surgery

Surgery is often the primary treatment for skull base tumours. Skull base procedures aim to remove as much of the tumour as possible while minimising damage to surrounding tissues and preserving neurological function. The choice of surgical approach depends on the tumour's location and size. It may involve traditional open surgery or minimally invasive techniques. In some cases, advanced techniques such as endoscopic or robotic-assisted procedures may be suitable.

Radiotherapy

Radiotherapy (also known as radiation therapy) uses carefully guided X-rays to destroy tumours or slow their growth. Radiotherapy may be the primary treatment for some types of skull base tumours, especially if complete surgical removal is not practical or if the tumour is aggressive. You might also have radiation therapy after surgery to eliminate any remaining tumour cells, or to help relieve symptoms.

Stereotactic radiosurgery

This non-invasive treatment involves using highly focused radiation beams to target the tumour. It is sometimes used to treat skull base tumours in critical or hard-to-reach areas, or in cases where surgery is not suitable.

Chemotherapy

Chemotherapy uses special drugs to destroy cancer cells while minimising damage to healthy ones. Chemotherapy drugs may be taken orally or given through a drip. You might be advised to have chemotherapy after surgery, to slow tumour growth, or to reduce your symptoms. Sometimes chemotherapy treatment will be combined with radiotherapy.

Targeted therapy

This involves prescribing drugs that target specific chemicals or pathways involved in tumour growth or progression. These drugs can disrupt the activity of tumour cells without affecting normal cells.

Palliative care

This type of treatment is designed to ease symptoms and optimise your quality of life. A palliative care team might be involved in your care when cancer is advanced, but you might also benefit from their support in earlier stages of the illness.

Surveillance and follow-up

Follow up is crucial for people with skull base tumours, even after successful treatment. Regular monitoring can help doctors detect any new growth or tumour recurrence early, enabling timely intervention if needed. Follow-up care may involve imaging tests, neurological examinations, and consultations with your treating team.

Recovery after skull base tumour treatment

Your recovery time will depend on the type of tumour and which treatment you have, along with factors like your age, general health, and lifestyle. All types of tumour treatment can have side effects. Your healthcare team will explain these to you and answer your questions.

Most people with a skull base tumour will have a multidisciplinary team involved in their care. In addition to medical and surgical specialists, this could include a cancer nurse, physiotherapist, occupational therapist, speech-language pathologist, psychologist and more.

Here's an overview of what you might expect during recovery following a surgical procedure for a skull base tumour.

Hospital stay

After skull base surgery, most people spend at least a few days in hospital for monitoring and postoperative care. How long this is will depend on the complexity of the surgery and your progress. You will be given instructions to follow, including how to care for the surgical wound.

Medications

It's normal to have some discomfort after a surgical procedure, and you will be given medications to help with this. You might also need antibiotics to help prevent infection. Your healthcare team will explain how to take any medications prescribed for you.

Physical recovery

Depending on the type of procedure you have, you may need to avoid some activities (such as heavy lifting) for a period afterwards. Physical recovery after surgery often involves support to regain your physical function and independence. You might need physiotherapy to help restore your mobility, and exercises to rebuild your strength, balance, fitness and coordination.

Other rehabilitation and support

Some people benefit from other forms of rehabilitation, such as speech therapy and occupational therapy, to regain optimal function. Your healthcare team will guide you on this and refer you to appropriate services if needed.

Emotional and psychological support

Discovering you have a skull base tumour can be very unsettling. Some people may experience anxiety, depression, or mood changes. Support from a mental health professional such as a psychologist or counsellor can be helpful for dealing with the emotional and psychological challenges of a tumour diagnosis.

Follow-up

Regular follow-up appointments will be scheduled to monitor your progress and review treatment outcomes. You may need further imaging tests, such as MRI or CT scans, to check the surgical site and look for any signs of tumour recurrence.

Importantly, recovery after treatment for a skull base tumour is a gradual process that typically takes several weeks to a year or more. Your healthcare team will work with you and your loved ones to develop a tailored plan. Following your team's instructions and letting them know about any concerns or symptom changes can help ensure a smooth recovery.

Sources

Information provided and reviewed by A/Prof Andrew Davidson, Neurosurgeon at Melbourne Private Hospital.

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