

Meningioma

The brain is wrapped in layers of membranes called meninges. A meningioma is a benign (non-cancerous) tumour that grows out of the meninges, particularly the one known as the arachnoid layer (so called because it looks like a web).

The tumour typically grows slowly and doesn't spread to any other part of the body. Close to one in five brain tumours are meningiomas. Women and older people are more likely to develop this type of tumour, for reasons unknown. Symptoms depend on the size and location of the meningioma, but may include headaches and seizures.

The primary form of treatment is surgery to remove the tumour completely. In rare cases, this isn't always possible because the meningioma is inaccessible, or parts may have invaded important blood vessels or nerves.

Symptoms of meningioma

The symptoms of meningioma depend on the location, type and size but may include:

- Seizures (fits)
- Headaches
- Impairment of brain functioning, depending on the location of the tumour.

Symptoms depend on location

Meningiomas are classified according to their appearance. For example, they may be cellular or fibrous or contain plenty of blood vessels. Another classification method is by location. Associated symptoms for a selection of meningioma locations may include:

- Between the brain lobes (parasagittal) - paralysis of usually one leg.
- Underneath the brain and behind the nose (olfactory groove) - loss of the sense of smell (anosmia).
- Underneath the brain and behind the eye (sphenoid wing) - seizures and multiple cranial nerve palsies.
- Rear of the brain (occipital lobe) - loss of half of the field of vision in one eye (contralateral hemianopsia).
- Spinal cord - pain in the spine, weakness and decreased ability to 'sense' the body's location.

How meningiomas cause symptoms

The symptoms of a meningioma can be triggered by various means including:

- **Compression** - the tumour may be large enough to squash the underlying brain tissue. Headaches are a common symptom.
- **Irritation** - the nerves of the brain may be irritated and disrupted by the tumour's presence, particularly if the tumour is located over the cortex (uppermost layer of the brain). Seizures are a common symptom of cortex irritation.
- **Invasion** - the tumour may invade brain tissue. Symptoms depend on which parts of the brain are affected.
- **Injuries to blood vessels** - the tumour may disrupt blood flow to various parts of the brain by injuring or blocking the blood vessels.

The cause of meningioma is unknown

The arachnoid layer is one of the membranes surrounding the brain. A meningioma grows from cells in the arachnoid layer called arachnoid cap cells. These cells help to regulate the amount of fluid within the brain. However, the cause of meningiomas is unknown. Risk factors are thought to include:

- Advancing age
- Prior radiation therapy
- Chromosomal abnormalities
- Female hormones.

Diagnosis of meningioma

Meningiomas are diagnosed using a number of tests including:

- Physical examination
- Medical history
- Skull x-ray
- Computed tomography (CT) scan
- Magnetic resonance imaging (MRI) scan
- Biopsy.

Treatment for meningioma

About eight out of 10 meningiomas can be cured. Treatment depends on the location, type and size of the tumour but may include:

- **Close monitoring** - your doctors may prefer to simply watch and monitor a small tumour.
- **Steroid medications** - to help reduce the inflammation and swelling around the tumour. A low-salt diet is also recommended.
- **Anti-epileptic drugs** - to reduce the risk of brain seizures.
- **Surgery** - the aim is to remove the tumour, or at least all parts that are safe to remove.

Craniotomy is the preferred treatment

Surgery to remove a meningioma is called a craniotomy. Ideally, the entire tumour is removed during the operation. If the tumour is located on the surface of the brain, complete removal (resection) is highly possible. However, meningiomas in hard-to-reach locations (such as underneath the brain) are difficult to remove because they are surrounded by so many vital structures.

Sometimes, the tumour might be in an accessible location, but has invaded blood vessels or wrapped around nerve fibres. To reduce the risk of complications such as injury to the brain, the surgeons may have to leave some parts of the tumour behind. Normal activities can be resumed in around one to three months after surgery, depending on individual circumstances.

Ongoing monitoring is important

After surgery, you will be slowly weaned off steroid medication, although it is sometimes necessary to continue taking anti-epileptic drugs for life. If only parts of the meningioma were removed, regular scans help to monitor the remaining tumour and keep track of its growth rate. Subsequent operations may be needed.

On the other hand, some meningiomas grow so slowly that they are virtually the same size some 10 years after the craniotomy. Even if the meningioma was completely removed during surgery, you will still need regular check-ups to ensure it hasn't returned, including scans for around five years. Occupational therapy, physiotherapy, speech therapy or other forms of rehabilitative health care may be necessary.

Treatment for a return meningioma

In some cases, the meningioma grows back after surgery. This is more likely to happen if only parts of the tumour were removed. Options may include:

- Repeat surgery
- Radiotherapy
- Chemotherapy
- Radiosurgery (surgery using narrow beams of radiation).

Where to get help

- Your doctor
- Neurologist
- Neurosurgeon.

Things to remember

- The brain is wrapped in membranes called meninges.
- A meningioma is a non-cancerous tumour that grows out of the meninges, for reasons unknown.
- Symptoms depend on which part of the brain is affected, but can include headaches, seizures and partial paralysis.
- Meningiomas respond well to treatment, with eight out of 10 cases cured.
- Treatment options include brain surgery, steroid drugs and anti-epileptic medications.

This page has been produced in consultation with, and approved by:

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