

Extradural Haematoma

An extradural haematoma usually occurs inside the head. It is a collection of blood in the 'potential' space between the skull and the outer protective lining that covers the brain (the dura mater). It usually occurs because of a head injury that causes a skull fracture. It is a serious condition and emergency treatment is needed. A CT scan can show an extradural haematoma. An operation to remove the haematoma may be needed.

What are the meninges and the epidural space?

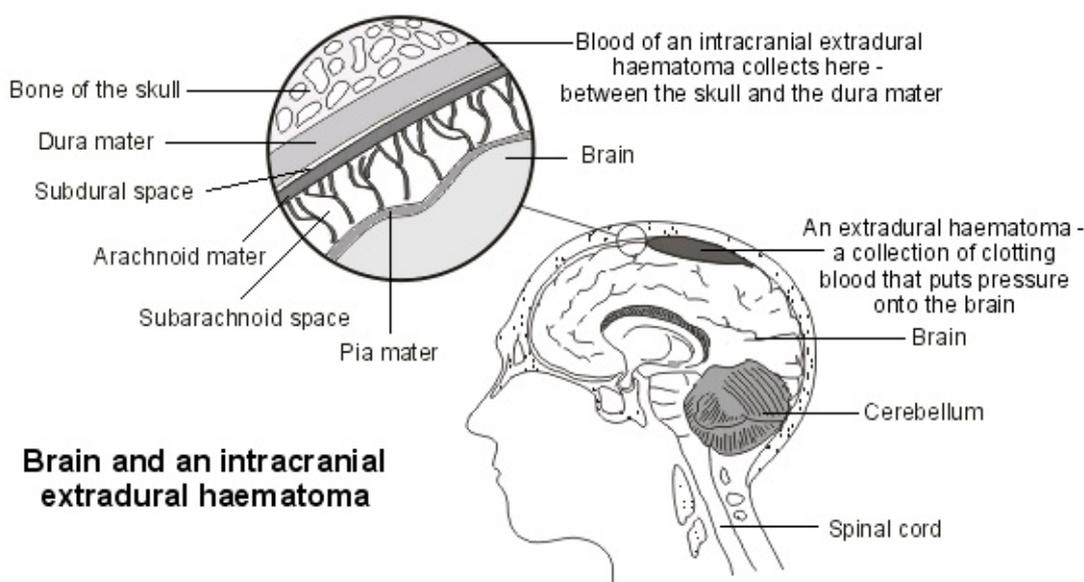
The meninges are the protective lining that surround and enclose the brain within the skull and the spinal cord within the vertebral column. (The vertebral column is the name given to the backbone, the column of bony vertebrae in the back that sit one on top of the other to surround and protect the spinal cord.)

There are three layers of meninges:

- The outermost layer that lies next to the skull or the vertebral column is called the dura mater.
- The middle layer is called the arachnoid mater.
- The inner layer that is closest to the brain or the spinal cord is called the pia mater.

There are also three spaces between the layers of meninges:

- The epidural space is the space between the vertebral column and the dura mater. (There is only a 'potential' epidural space in the head between the skull and the dura mater.)
- The subdural space is the space between the dura mater and the arachnoid mater.
- The subarachnoid space is the space between the arachnoid mater and the pia mater.



What is an extradural haematoma?

An extradural haematoma is a collection of blood in the epidural space. 'Extradural' means outside the dura.

In the spine, the epidural space is the space between the backbone (vertebral column) and the outer protective lining that covers the brain (the dura mater). An extradural haematoma that occurs in the spine is called a *spinal* extradural haematoma.

In the head, the epidural space is the 'potential' space between the skull and the dura mater. (The dura mater is usually bound quite firmly to the inside of the skull.) An extradural haematoma that occurs in the head is called an *intracranial* extradural haematoma.

An extradural haematoma is sometimes called an epidural haematoma because the blood collects in the epidural space. It is also sometimes called an extradural haemorrhage (haemorrhage means that bleeding has occurred).

There is a similar condition called subdural haematoma where a collection of clotting blood forms in the subdural space. This is dealt with in another leaflet called [Subdural Haematoma](#).

What causes an extradural haematoma?

Spinal extradural haematoma

A spinal extradural haematoma is less common than an intracranial extradural haematoma. Sometimes a spinal extradural haematoma can occur after an injury around the spinal area. For example, it can (rarely) occur after a [lumbar puncture](#) (a procedure where a sample of fluid that surrounds the brain and spinal cord is taken with a needle to help diagnose conditions such as [meningitis](#)). It may also (rarely) occur after an epidural anaesthetic (a common type of pain relief used during childbirth and for other reasons). However, this is not common. A review looked at 1.37 million women who received an epidural for childbirth in the USA. It found that epidural haematoma only occurred in 1 in 168,000 cases.

Rarely, a spinal extradural haematoma is not related to any injury or trauma and can occur spontaneously in people who are, for example, taking anticoagulation treatment to thin the blood or who have blood clotting problems.

Intracranial extradural haematoma

An extradural haematoma usually occurs inside the head, most commonly after a fractured skull caused by a head injury.

The fractured skull bone can cause separation of the dura mater from the inside of the skull and can cause damage to a blood vessel (usually an artery). The damaged blood vessel causes blood to leak and collect in the potential epidural space between the skull and the dura mater. This build-up of blood can cause the pressure inside the head to rise. This can put pressure on the brain and cause injury to the brain if it is not treated quickly. Typically, an extradural haematoma is caused by a severe head injury - for example, in a road traffic accident.

The blood usually collects in the epidural space soon after a head injury and symptoms of an extradural haematoma are usually noticed quickly. So, most extradural haematomas are 'acute' injuries. Occasionally, bleeding can occur more slowly and an extradural haematoma may cause few symptoms (and so not be noticed) until some days after a head injury.

The rest of this leaflet just discusses intracranial extradural haematoma.

Who gets an intracranial extradural haematoma?

About 6 out of 10 people with an intracranial extradural haematoma are under the age of 20. It is less common in elderly people because the outer protective lining that covers the brain (the dura mater) becomes stuck more closely to the skull and makes it more difficult for blood to collect in the 'potential' epidural space. In young people, the dura mater is not as firmly attached to the skull.

Someone who drinks excessive amounts of alcohol may be more likely to develop an intracranial extradural haematoma. This is partly due to the fact that they are more likely to fall and injure their head. An intracranial extradural haematoma is also more common in men than in women.

How common is an intracranial extradural haematoma?

Head injuries are often minor and not serious. Most people with a minor head injury will not get an intracranial extradural haematoma. One develops in about 2 in 100 people with a head injury. It usually occurs after a severe head injury.

What are the symptoms of an intracranial extradural haematoma?

You may lose consciousness at the time of the head injury but this does not always happen. Classically, someone who develops an intracranial extradural haematoma loses consciousness at the time of the head injury and then has a 'lucid interval' of a few hours after the head injury where they appear relatively well and normal. Later, they deteriorate and lose consciousness again as the haematoma forms. However, not everyone shows this classic pattern.

If you do not lose consciousness after the initial head injury, or if you regain consciousness, you may experience drowsiness or a severe headache. You may also feel sick (have nausea) and/or be sick (have vomiting). You may become confused and may develop weakness of an arm and/or a leg on one side of your body and/or speech difficulties. Sometimes a fit (seizure) can occur. Some people with an intracranial extradural haematoma can be talking one minute and appear relatively well and can then become very ill and lose consciousness the next.

If you have a significant head injury, you should be taken to hospital urgently by ambulance. Anyone who loses consciousness at the time of a head injury should be taken to hospital straightaway. Anyone who develops any of the other symptoms mentioned above after a head injury should also see a doctor urgently.

How is an intracranial extradural haematoma diagnosed?

Someone with a suspected intracranial extradural haematoma should be seen in a hospital. It is a serious condition and emergency treatment is needed. The doctors and nurses will be able to perform a full examination to look for signs of a possible intracranial extradural haematoma and also signs of any other injury that you may have. They will be able to check your level of consciousness, look for any signs of arm or leg weakness and also examine your eyes to look for any signs of raised pressure within the skull.

Blood tests may be taken to look for other possible reasons for confusion and/or loss of consciousness. Blood tests may also show any problems with blood clotting/abnormally 'thin' blood. A **CT scan** of the head is good at detecting an intracranial extradural haematoma. It can also show any skull fracture that may be present. You may need other scans or **X-rays** depending on whether any other injuries are suspected. For example, an X-ray of your neck may be taken to rule out any co-existing neck injury.

What is the treatment for an intracranial extradural haematoma?

If you have an intracranial extradural haematoma, the priority is first to stabilise your condition. For example, you may need treatment to stabilise your blood pressure. If you have breathing difficulties or your consciousness level is affected, you may need help with your breathing using a ventilator. If there are signs of raised pressure inside your head, emergency treatment is needed. Medicines may be given and/or surgery is needed (see below).

A small intracranial extradural haematoma that is not producing any symptoms (or the symptoms are not severe), can sometimes be treated just by careful monitoring and observation. The blood clot may clear (re-absorb) by itself. Repeated physical examinations are usually carried out to assess your level of consciousness and look for any symptoms that may appear such as headache, arm or leg weakness, etc. Repeated CT scanning may also be used to ensure that the haematoma is not getting any bigger. Surgery is needed to treat an intracranial extradural haematoma if symptoms start to appear and your condition deteriorates.

However, generally, surgery is needed to treat an intracranial extradural haematoma. This is usually carried out by a neurosurgeon and involves removal of the haematoma. Most commonly, surgery either involves making 'burr holes' in the skull or an operation called a craniotomy.

Burr holes are small holes that are drilled through the skull over the area where the haematoma has formed. They allow the blood to be removed, or 'sucked out', through the holes. Stitches or staples are then used to close the burr holes. A craniotomy is where a portion of the skull is removed so that the brain and meninges are exposed. It can relieve any raised pressure inside the skull and also means that the clotting blood in the extradural space can be removed. The section of skull that was removed is then replaced and fixed back in place, re-attaching the outer protective lining that covers the brain (the dura mater) to the skull bone.

Close follow-up is needed after the operation, usually in an intensive care unit.

What is the outlook (prognosis)?

Provided that quick treatment is carried out, the outlook is generally good. In those people who are conscious before they have surgery, death is extremely unlikely and surgery usually has a very good outcome. However, the outlook is not as good in those who are unconscious before they have surgery.

There is a risk of permanent brain injury even if an intracranial extradural haematoma is treated. This may lead to, for example, weakness on one side of the body, speech problems, fits (seizures), etc. Sometimes these symptoms can improve over time with treatments such as physiotherapy or speech therapy. Medication may be needed to control seizures.

Can an intracranial extradural haematoma be prevented?

If you or your children take part in sports such as cycling, roller-blading, skiing, boxing or skate-boarding, you should make sure that you wear a helmet/protective headgear so as to reduce the risk of serious head injury. The same applies for horse riding and riding a motorcycle.

Seat belts and child safety seats should always be used in cars and other vehicles.

Sensible alcohol consumption can also make a difference. Alcohol is often a contributing factor in serious head injury, whether this is drinking and driving or binge drinking followed by falls or fighting.

Further reading & references

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