Risks associated with your anaesthetic

Section 11: Nerve damage associated with a spinal or epidural injection

Your anaesthetist may suggest that you have a spinal or epidural injection. These injections can rarely be associated with nerve damage. This section gives you information about:

- **spinal and epidural injections**
- **how nerve damage can happen**
- **what the symptoms are**
- **how likely this is**
- **what recovery can be expected.**

What is a spinal injection?

A needle is inserted between the bones of your back, through ligaments and then through the dura. The dura is a membrane which encloses the nerves and spinal cord. Spinal injections are usually performed near the lowest part of the spine. At this level, the spinal cord itself has ended and a bundle of nerves is present which supplies the legs and genital area. Nerves in this area are bathed in cerebro-spinal fluid (CSF). A single injection of local anaesthetic is given and the needle is removed. This injection makes you feel numb in the lower part of the body for about two hours.

You can find out more about having a spinal injection in the leaflets 'Anaesthesia Explained' and 'Your spinal anaesthetic' on the Royal College of Anaesthetists website (**www.rcoa.ac.uk**).

What is an epidural?

A needle is used to introduce a fine catheter (tube) into your back. The needle is passed between the bones, through ligaments and into a space outside the dura. The catheter is passed through the needle into this space and the needle is removed. The catheter is taped securely to your skin. Local anaesthetic can be given through this catheter for a period of time – perhaps several days.

An epidural is used for operations which are longer than two hours or when pain relief is needed for several days.

You can find out more about having an epidural in the leaflets 'Anaesthesia Explained' and 'Your epidural for pain relief' on the Royal College of Anaesthetists website (**www.rcoa.ac.uk**).

Risks and benefits

You can find general information about the risks and benefits of spinal and epidural injections in the leaflets named above. Your anaesthetist will be able to tell you more about your individual risks and benefits. He/she will also be able to describe alternative treatments, which will also have benefits and risks.

This article describes nerve damage associated with spinal and epidural injections. It is aimed at patients having all kinds of operations. If you are planning to have an epidural or a spinal for childbirth you can find additional information at **www.oaa-anaes.ac.uk** – Information for Mothers section.

What types of nerve damage can happen?

Nerve damage is a rare complication of spinal or epidural anaesthesia. Nerve damage is usually temporary. Permanent nerve damage resulting in paralysis (loss of the use of one or more limbs) is very

rare. More figures are given at the end of this section.[1–5]

- A single nerve or a group of nerves may be damaged. Therefore the area affected may be small or large.
- In its mildest form you can get a small numb area or an area of 'pins and needles' on your skin.
- There may be areas of your body that feel strange and painful.
- Weakness may occur in one or more muscles.
- The most severe (and very rare) cases give permanent paralysis of one or both legs (paraplegia) and/or loss of control of the bowel or bladder.

The majority of people make a full recovery over a period of time between a few days and a few weeks. Permanent damage is very rare.

How does nerve damage happen?

The ways in which nerve damage can be caused by a spinal or epidural injection are listed here and explained below.

- Direct injury caused by the needle or the catheter.
- Haematoma (a blood clot).
- Infection.
- Inadequate blood supply.
- Other causes.

Direct injury

This can occur if the epidural or spinal needle or the epidural catheter damages a single nerve, a group of nerves or the spinal cord.

Contact with a nerve may cause 'pins and needles' or a brief shooting pain. This does not mean that the nerve is damaged, but if the needle is not repositioned, damage can occur. If this happens you should try to remain still and tell your anaesthetist about it. The anaesthetist will change the position of the needle and the sensations will usually improve immediately.

Most cases of direct damage are to a single nerve and temporary. Injecting drugs right into the nerve rather than into the area surrounding it can also cause direct damage.

Haematoma

This is a collection of blood near the nerve, which collects due to damage to a blood vessel by the needle or the catheter. Small amounts of bleeding or bruising are common, and do not cause damage to the nerve. A large haematoma may press on a nerve or on the spinal cord and cause damage. Occasionally an urgent operation is required to remove the haematoma and relieve the pressure.

If your blood does not clot normally or you take a blood-thinning medicine (anti-coagulants) such as warfarin or heparin, you are more likely to get a haematoma. You will need to stop these medicines before you can have an epidural or spinal injection. It is important that you tell your anaesthetist about any problems with blood clotting that you have had in the past as you may not be able to have an epidural or spinal injection. See below for more details about anti-coagulants.[6,7]

Infection

Most infections related to a spinal injection or an epidural are local skin infections and do not cause nerve damage. Very rarely, an infection can develop close to the spinal cord and major nerves. There may be an abscess (a collection of pus) or meningitis. These infections are very serious and require urgent treatment with antibiotics and/or surgery to prevent permanent nerve damage.

If you already have a significant infection elsewhere, or if you have a weak immune system, you have a higher risk of these serious infections. You may not be offered an epidural or spinal injection.

Inadequate blood supply

Low blood pressure is very common when you have an epidural or spinal injection. This can reduce the blood flow to nerves and, rarely, this can cause nerve damage. Anaesthetists are aware of this risk and use both drugs and intravenous fluid to prevent large drops in blood pressure.

Other causes

There have been cases of the wrong drug being given in an epidural or spinal injection. This is an exceptionally rare event.

What else can cause nerve damage?

If you have nerve damage, you should not assume that it is caused by the epidural or spinal injection. The following list shows other causes of nerve damage related to having an operation. You can find more about these causes in Section 10 in this series.

- Your nerves can be damaged by the surgeon. During some operations, this may be difficult or impossible to avoid. If this is the case, your surgeon should discuss it with you beforehand.
- The position that you are placed in for the operation can stretch a nerve and damage it.
- The use of a tourniquet to reduce blood loss during the operation will press on the nerve and may damage it.
- Swelling in the area after the operation can damage nerves.
- Pre-existing medical conditions, such as diabetes or atherosclerosis (narrowing of your blood vessels), can make damage more likely.

What is done to prevent nerve damage?

Anaesthetists are trained to be aware of nerve damage. Steps taken to prevent each kind of damage are described here.

Direct injury

- All anaesthetists performing epidural and spinal injections are trained in these techniques.
- Spinal injections are placed below the expected lower end of the spinal cord. This should prevent damage to the spinal cord itself.
- Spinal injections are usually performed while you are awake or lightly sedated. If there is pain or tingling due to contact with a nerve, you will be able to warn the anaesthetist.
- Your anaesthetist may wish to do your epidural injection while you are awake. Direct nerve injury after an epidural injection is rare, and so there is no clear evidence about whether it is safer to do the epidural while you are awake or after the general anaesthetic has been given. Anaesthetists vary in their views on this matter and you should discuss your preference about this with your anaesthetist.

Haematoma

- If you take an anti-coagulant (a drug which thins the blood, such as warfarin), you will be asked to stop it several days before surgery IF your doctors think it is safe to do so. The anaesthetist and surgeon together will decide if and when the drug should be stopped.[5] A blood test will allow your anaesthetist to decide if it is safe to have a spinal or epidural injection. If your anti-coagulation cannot be safely stopped, then you will not be able to have an epidural or spinal injection.
- If you take aspirin, you can have an epidural or spinal injection. However, your surgeon may ask you to stop taking the aspirin to help prevent bleeding during or after the operation.

Infection

All epidural and spinal injections are performed under sterile conditions, similar to those used during the operation. Your back should be kept clean and regularly checked over the next few days.

General care

If you have an epidural or spinal injection, the nurses will make regular checks until everything returns to normal. This should help spot possible nerve damage very early and if treatment is needed it can be started immediately.

If I think I have nerve damage, what can be done about it?

Your anaesthetist or surgeon may arrange for you to see a neurologist (a doctor specialising in nerve diseases). Tests may be done to try and find out exactly where and how the damage has occurred. This might involve:

- nerve conduction studies (very small electrical currents are applied to the skin or muscles and recordings made further up the nerve. This shows whether the nerve is working or not)
- Magnetic Resonance Imaging (MRI)
- Computed Tomography (CT) scanning.

The neurologist will suggest a treatment plan, which might include physiotherapy and exercise. If you have pain, drugs that relieve pain will be used. This may include drugs that are normally used for treating epilepsy or depression because of the way that they change electrical activity in nerves. Drug treatment is not always successful in relieving pain.

Occasionally an operation can be done, either to repair a nerve or to relieve pressure on a stretched nerve.

How likely is permanent nerve damage?

A large national audit of major complications from spinal or epidural injections performed in the UK was published in 2009 by the Royal College of Anaesthetists and is available on the College website.[4] The audit estimated that just over 700,000 central nerve blocks are done each year in the UK in NHS hospitals. 45% are epidural injections and about 40% are spinal injections. The report describes the risks and benefits of these injections in great detail and gives specific information on the risk of nerve damage. The number of people known to have nerve damage is very small. The following figures are a guide:

Estimated frequency (cases per spinal/ epidural injection):

The risk of damage to nerves is between **1 in 1,000 and 1 in 100,000**.

In many of these cases the symptoms improve or resolve within a few weeks or months.

The risk of longer lasting problems is

- **Permanent harm**
  1 in 23,500 to 50,500
- **Paraplegia or death**
  1 in 54,500 to 1 in 141,500

Summary

Nerve damage is a rare complication of spinal or epidural injection.

In the majority of cases, a single nerve is affected, giving a numb area on the skin or limited muscle weakness. These effects are usually temporary with full recovery occurring within days or a few weeks.

Significant permanent nerve damage resulting in the loss of the use of your legs is very rare.

Some people have a higher risk of permanent damage. Your anaesthetist will balance this against the benefits of an epidural or spinal injection.

Your anaesthetist will be able to tell you about the benefits and risks of an epidural or spinal injection for you as an individual. He/she will also be able to describe the alternatives.

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