

Risks associated with your anaesthetic

SECTION 12: NERVE DAMAGE ASSOCIATED WITH A SPINAL OR EPIDURAL INJECTION

Your anaesthetist will talk to you about the balance between the benefits and the risks of having an epidural or a spinal injection. These injections are usually carried out without any problems, but can rarely be associated with nerve damage. This section gives you information as follows:

- What are spinal and epidural injections?
- What types of nerve damage can happen and what are the symptoms?
- How does nerve damage happen?
- What can be done to prevent nerve damage? If I think I have nerve damage, what can be done about it?
- How likely is permanent nerve damage?
- How frequent is this type of nerve damage?

What is a spinal injection?

A very thin needle is inserted between the bones of your back, through ligaments and then into the fluid surrounding the spinal cord. Spinal injections are usually performed in the lower 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 surrounded by a liquid called cerebro-spinal fluid (CSF). A single injection of local anaesthetic (sometimes with other painkillers) is given and the needle is removed. This injection should make you feel numb in the lower part of the body for between about two and four 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 injection?

A larger needle is used to introduce a thin catheter (tube) into your back. The needle is passed between the bones, through ligaments and into a space outside the linings of the spinal cord. The catheter is passed through the hollow needle into this space and the needle is then removed. The catheter is taped securely to your skin. You can lie on your back with this catheter in place. Local anaesthetic and other drugs 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* at 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.

How do we know about these risks?

We know about the risks of epidurals and spinals from medical research. A few years ago all the anaesthetists in the country contributed to a project that examined this topic in detail.

The project collected reports from anaesthetists of any major problem that had occurred with an epidural or a spinal performed in an NHS hospital in the UK for a period of 1 year. During this time over 700,000 epidurals and spinals were inserted, and the project aimed to collect reports of every major complication that occurred. It gave us a lot of information about risks. The project was called the 3rd National Audit Project (NAP3). For those interested in the details of this big project, all the results are available at www.rcoa.ac.uk/nap3.

What types of nerve damage can happen?

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

- ▶ 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 are temporary. Injecting drugs right into the nerve rather than into the area surrounding it can also cause direct damage.

Haematoma (blood clot)

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. This is a very rare problem, but may require an urgent operation to remove the haematoma and relieve the pressure.

If your blood does not clot normally or you take a blood-thinning medicine such as warfarin, heparin or clopidogrel, you are more likely to get a haematoma. In most circumstances you will be asked to stop these medicines, before you have an epidural or spinal injection. If your blood does not clot for other reasons (e.g. haemophilia) you are also at increased risk of this complication. 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 blood thinning medicines.⁵

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 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 and all anaesthetists take precautions to eliminate this type of error.

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 surgery. 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. Tourniquets are used for many orthopaedic arm and leg operations.

- ▶ Swelling in the area after the operation can damage nerves.
- ▶ Pre-existing medical conditions that interfere with blood supply (e.g. diabetes or atherosclerosis – narrowing of your blood vessels) or with nerve function (e.g. multiple sclerosis) can make damage more likely or make it more difficult to determine the cause of complications.

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 who will then be able to adjust.
- ▶ Your anaesthetist may wish to do your epidural injection while you are awake. Direct nerve injury after an epidural injection is rare, and there is no clear evidence about whether it is safer to do the epidural while you are awake or after a 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 (blood clot)

- ▶ 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 clopidogrel (another drug which thins the blood by its effect on platelets), you will usually be asked to stop it several days before planned surgery. For urgent surgery, your doctors will think about whether it is safer for you to have or to avoid a spinal or epidural injection.
- ▶ If you take aspirin, you can have an epidural or spinal injection.

Infection

All epidural and spinal injections are performed under 'aseptic conditions' (i.e. using special precautions to make the procedure as clean as is possible), 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?

If you are concerned you may have nerve damage from an epidural or spinal injection it is important your anaesthetist knows about it. Your anaesthetist will be able to assess you. Your anaesthetist 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): a form of body scan
- ▶ Computed Tomography (CT): a form of body scan.

If necessary, 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 is necessary, either to repair a nerve or to relieve pressure on a stretched nerve.

How likely is permanent nerve damage?

The best data available in the UK comes from the NAP3 project described above. The risk of damage to nerves is rare. In many of these people the symptoms improve or resolve within

a few weeks or months. The risk of longer lasting problems for all types of spinal and epidural injection is:

- ▶ permanent harm 1 in 23,500 to 50,500 spinal or epidural injections
- ▶ paraplegia or death 1 in 54,500 to 1 in 141,500 spinal or epidural injections.

These figures are only broad guidelines. The risk may be higher or lower depending on your general health and the circumstances in which you are having the spinal or epidural. Your anaesthetist can give you more specific information.

If you want to read more detailed, technical information you can visit the College website at www.rcoa.ac.uk/nap3 or if you have an iPhone you can download an iPhone app 'iNAP3' from the apple app store.

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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