Royal Devon and Exeter NHS
NHS Foundation Trust

Patient Information

Lumbar Spinal Fusion

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Introduction

You have been scheduled for a procedure known as a lumbar spinal fusion. This is an operation performed with the aim of relieving low back pain. It is a major undertaking. It is reserved for patients with severe and incapacitating low back pain. Usually, non-surgical treatments have failed, and imaging studies (x-rays, scans etc.) have identified as far as is possible, where your back pain comes from. As the patient you must understand the limits of surgery, the potential outcomes of an operation, and accept the risks versus rewards scenario.

Reason for surgery

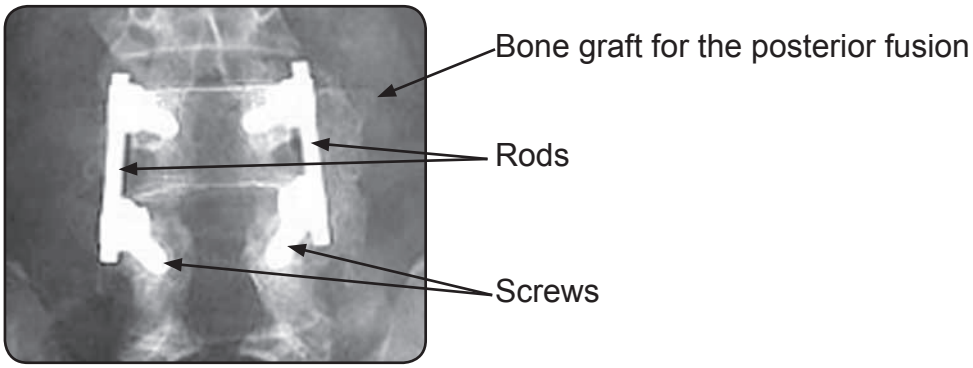
Spinal fusion is reserved for patients with severe and incapacitating low back pain. A major obstacle to the successful treatment of spine pain by fusion is the difficulty in accurately identifying where the pain comes from. The theory is that pain can originate from abnormal spinal movement, and fusing the bones/vertebrae together to eliminate the movement will get rid of the pain. Unfortunately, current techniques to precisely identify which of the many structures in the spine could be the source of a patient's back pain are not perfect. Because it can be so hard to locate the source of pain, treatment of back pain alone by spinal fusion is somewhat controversial. Fusion under these conditions is usually viewed as a last resort and should be considered only after other conservative (non-surgical) measures have failed.

How is fusion done?

Your operation will be performed under general anaesthetic. There are many surgical approaches and methods to fuse the spine, and they all involve placement of a bone graft between the vertebrae. The spine may be approached and the graft placed from the back (posterior approach), from the front (anterior approach), from the side (lateral approach) or by a combination of 2 of these.

The ultimate goal of fusion is to obtain a solid union between two or more vertebrae. Fusion may or may not involve use of hardware (instrumentation) such as plates, screws and cages.

In posterior spinal fusion, you will have a wound at the base of your spine. Screws are placed into the bones, connected by rods, and bone graft placed around the area. See picture below:

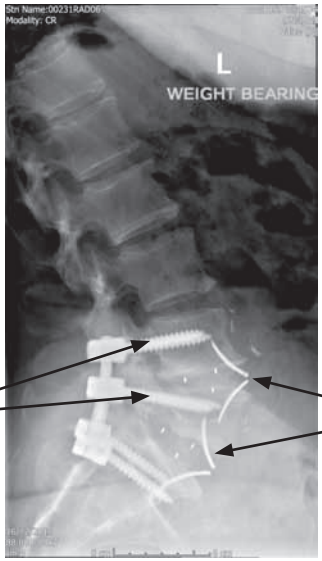


In anterior spinal fusion surgery, the spine is approached through an incision in the low tummy. The pelvic contents are gently moved off to one side to allow access to the front of the spine. The joint between the 2 bones being fused together (the lumbar inter-

vertebral disc) is excised and a bone graft placed between the 2 bones. This bone graft is contained within a spinal implant known as a cage. The cage is secured in place. Sometimes, the anterior surgery is also accompanied by screws and rods being placed into the back of the spine, through a separate incision. See picture below:

X-ray of the spine taken from the side showing a fusion between the 4th and 5th lumbar bones and also between the 5th lumbar bone and the sacrum:

Screws inserted into the back of the spine to provide stability



Cage containing bone graft for the anterior fusion

Instrumentation is used as an internal splint to hold the vertebrae together while the bone grafts heal. The bone may be taken either from another bone in the patient, or a man made bone substitute may be used or bone may be used from a bone bank. (Some patients undergoing hip replacement surgery are able to donate bone to us. We sterilize it, ensure it is free from disease and freeze

it. It is stored in the bone bank and used when other patients require bone grafting procedures.) Smoking, medications you are taking for other conditions and your overall health can affect the rate of healing and fusion. You must inform the surgeon of medications that you are taking.

How long will it take to recover?

Patients generally stay in the hospital for two to four days, but a longer stay after more extensive surgery is not uncommon. You will be up and walking usually within two days of your operation.

The fusion process varies in each patient. In general, the earliest evidence of bone healing is not apparent on x-ray until at least six weeks following surgery. Substantial bone healing does not usually take place until at least three months after surgery. At that time activities may be increased, although bone healing and remodelling may continue for up to a year after surgery.

The length of time required off work after your operation will depend upon both the type of surgery and the kind of job you have. It can vary anywhere from approximately 4-6 weeks for a one joint fusion in a young, healthy patient with a sitting down job, to as much as 4-6 months for more extensive surgery in an older patient with a more physically demanding occupation.

You may find it difficult to drive for several weeks after surgery. You may return to driving when able to sit comfortably in a passenger seat, when you are able to control the foot pedals safely and when you have come off painkillers that have a sedative effect. The final decision is best advised by your Surgeon

Your sex life can begin when you are comfortable, usually about 3-6 weeks after surgery although vigorous sexual activity should be avoided until it is confirmed that your fusion is solid.

In addition to some restrictions in activity, a brace is occasionally used for the early post-operative period of 6-12 weeks. This can be taken off to go to bed and to have a shower but is otherwise worn at all times until you are advised by your surgeon that it can be discarded. Most patients do not need a brace.

Following spinal fusion surgery, a postoperative rehabilitation program may be recommended by your surgeon. This will include back strengthening exercises and possibly a cardiovascular (heart and lung fitness) conditioning programme to safely get you back to work and other normal activities. The decision to proceed with a postoperative rehabilitation program depends upon many factors and your surgeon will tell you when it is appropriate for you.

You will be allowed to return to swimming at between three and twelve weeks after surgery. A return to other sports will take usually more than 6 months.

What can I expect in the long run?

Although fusion can be a very good treatment for some spinal conditions, it does not return your spine to “normal.” The normal spine has movement between the bones. Fusion surgery eliminates the ability to move between the fused bones, which can put added strain on the joints immediately above and below the fusion. This has some potential to accelerate wear and tear of those joints, but this risk varies between individuals. Fortunately, once a fusion has healed it rarely, if ever, breaks down.

Rewards of surgery

The aim of surgery is to significantly reduce back pain. Two recent studies have identified that two-thirds of patients are satisfied with the outcome of their surgery - but they are not pain-free. This means that one-third of patients remain dissatisfied.

Risks of surgery

All operations carry some degree of risk. Risks of spinal fusion include:

The risks of a general anaesthetic

General anaesthetics have some risks, which may be increased if you have chronic medical conditions, but in general they are as follows:

- **Common temporary side effects** (risk of 1 in 10 to 1 in 100) include bruising or pain in the area of injections, blurred vision and sickness, these can usually be treated and pass off quickly.
- **Infrequent complications** (risk of 1 in 100 to 1 in 10,000) include temporary breathing difficulties, muscle pains, headaches, damage to teeth, lip or tongue, sore throat and temporary problems with speaking.
- **Extremely rare and serious complications** (risk of less than 1 in 10,000). These include severe allergic reactions and death, brain damage, kidney and liver failure, lung damage, permanent nerve or blood vessel damage, eye injury, and damage to the voice box. These are very rare and may depend on whether you have other serious medical conditions.

Deep vein thrombosis (DVT)

Deep vein thrombosis is a possible problem, but is uncommon. If you are at particular risk then special precautions will be taken to reduce the risk. Moving your legs and feet as soon as you can after the operation and walking about early, all help to stop thrombosis occurring.

Wound infection

Deep wound infection that does not respond to antibiotic treatment is a serious problem that may ultimately require further surgery.

Pain

Despite a technically successful operation, there is a risk that your pain is no better and there is a small chance it may even be worse. Remember, up to one-third of patients may not be improved with surgery.

Nerve injury

There is a small chance of injury to the nerves in the spine that supply the legs. The severity of this can vary- from a small degree of numbness to complete loss of strength in the muscles supplied by the nerve involved. Thankfully, severe nerve injury is extremely rare but if this occurs, it can cause permanent weakness and numbness in the legs and could cause loss of control of the bladder and bowels and loss of sexual function.

New pain

A risk of a new pain from the site from where the bone graft is taken.

Bone graft failure

That the bone graft does not fuse together and if it fails to do so may result in persistent pain and in rare cases a need to re-do the operation.

Injury to blood vessels

If anterior spinal surgery is used (i.e. the spine is approached through the abdomen), there is a risk of injury to the large blood

vessels that sit in front of the spine. In men, there is a small risk of damage to the nerves that control ejaculation. This can render men temporarily sterile- but does not cause impotence. The nerves that control temperature sensation in the legs can be damaged resulting in one leg feeling cooler than the other.

As you can see, this list of potential complications is both long and daunting. Thankfully, the vast majority of spinal fusion operations pass off without any problems. However, it is important you understand the magnitude of the surgery you are embarking upon.

Summary

Spinal fusion is a technically demanding major undertaking in the treatment of low back pain. You should not consider having a spinal fusion unless you have severe incapacitating back pain. Successful surgery can dramatically improve pain and allow patients to enjoy their life once more. A successful result is not only dependent on successful surgery. It requires a motivated patient who is prepared to work both pre and post-operatively at their rehabilitation. Once the surgery is over, and fusion is achieved, the rest is down to the patient.

The decision whether or not to undergo spinal fusion is complex and involves many factors. This decision must be made carefully and should be discussed thoroughly with your surgeon.

This information can be offered in other formats on request, including a language other than English and Braille.

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