



Patient Information

Minimally Invasive Transforaminal Lumbar Interbody Fusion

Following your MRI scan and consultation with Dr Ratahi, the possibility of undergoing **lumbar spinal interbody fusion** has been discussed with you. This is an operation where the intervertebral disc, the structure between the bones of the spine (vertebrae), is removed and the space fused with a bone graft.

The healthy intervertebral disc acts as both a spacer and a shock absorber. Sometimes the intervertebral discs can lose their flexibility, elasticity and shock absorbing characteristics and the tough layer of ligaments that surrounds the disc may weaken and no longer be able to contain the gel-like substance in the center. This disc degeneration can cause inflammation in the surrounding area and some of these discs can be a source of continuing back pain and pain in the thighs and buttocks, stiffness, muscle tightness and tenderness. This is known as discogenic pain. Discogenic pain can also be caused by an injury to your back, or be the sequel to previous spinal surgery.

Occasionally, the intervertebral disc can protrude because the tough fibrous wall weakens and is therefore no longer able to contain the gel-like substance in the centre. This material may bulge or push out through a tear in the disc wall (herniation) causing pain when it touches a nerve. Lumbar nerve root pain (often called sciatica) generally goes below the knee and is felt in the area of the leg that the particular spinal nerve supplies. Symptoms also associated with sciatica include altered sensation, pins and needles, burning, numbness or even weakness of the muscles in the leg that the nerve supplies.

Treatment varies depending on the severity of the condition. Most patients only require treatment such as physiotherapy and medication, combined with some lifestyle changes or less extensive surgery, such as disc decompression. For patients whose pain does not settle with treatment or surgery, lumbar fusion surgery may be necessary. Surgery for lower back pain caused by intervertebral disc disease is only considered an option for patients who:

- have not had sufficient pain relief from extensive non-surgical treatment (such as physiotherapy, medications and pain management programmes);
- have recurrent disc protrusions;
- have ongoing lower back pain that limits their ability to perform everyday activities at work or at home; or
- have received a diagnosis that a specific disc is the pain generator and other possible causes of the lower back pain have been considered and ruled out.

The decision to have a lumbar interbody spinal fusion operation to treat lower back pain caused by disc disease is a very personal one. For the most part, it is a non-progressive type of back condition and for the majority of people their symptoms will improve over time (up to 10 years). Patients need to carefully consider the risks and possible complications along with the potential benefits of surgery.

Technically, there is a wide variety of surgical procedures that can be performed to fuse the spine, including different cages or spacers to insert into the disc space with a bone graft. The approach to the spine can also vary but in your case will be from the back, by transforaminal lumbar interbody fusion (TLIF).

Once the diagnosis and the decision to undergo spinal interbody fusion have been made, the goal is then to obtain a solid fusion and stop the movement at that level.

What happens before I come into hospital?

This information will help you prepare for admission to hospital. Treatment is always planned on an individual basis so your experience may differ slightly from the information given.

Dr Ratahi will perform your operation at Kensington Hospital.

All our staff are friendly and available to help answer any questions that you may have at any stage of your treatment.

Pre-assessment

If there are concerns around your fitness for an anaesthetic you may be asked to attend a pre-assessment. This is a medical examination made by the anaesthetist who works with Dr Ratahi to make sure you are well enough for surgery.

Transport

Patients are responsible for their own transport to and from the hospital. You will be informed of your admission and discharge date in advance so that you can arrange for a relative, friend or taxi to transport you.

What happens on the day of surgery?

On the morning of your surgery you will be greeted by the staff at the hospital reception on your arrival. Before being taken to the theatre suite you will be greeted by the nursing staff who will be looking after you and ask you to change into a hospital gown to get you prepared for theatre. You will be assessed by Dr Ratahi and the anaesthetist to perform a final check that you are fit for surgery and answer any questions you may have. You will be asked to sign a form giving your consent to the operation. You will then go to theatre, accompanied by a nurse where your personal details and the operation will be confirmed.

The operation

The operation is performed under general anaesthetic so you are fully asleep. Small incisions are made on either of your back at the level surgery is to be performed.

A high-speed burr (like a dentist's drill) is used to go through the bone to gain entry into the spinal canal. The bone is clipped away as required and the disc is then removed, right back to the bone edge of the vertebral body (end plates). The space left by removing the disc is replaced by bone graft and a cage / implant. Your own bone will, over time, grow into the bone graft. There are two sources bone graft needed for spinal fusion:

- patient's own bone (autograft bone). The bone that is removed during surgery can be used as a bone graft.
- donor bone (allograft bone). This eliminates the need to use your own bone. The donor bone graft acts as a calcium scaffolding which your own bone grows into and eventually replaces;

An internal system of screws and rods is necessary to aid stability while the fusion takes place. These are called pedicle screws because they are placed into the part of the vertebral body of the same name, which goes directly from the back of the spine to the front. They are placed on both sides of the vertebra, above and below the disc space. These screws then act as firm anchor points to which rods can be connected. This construction then prevents movement at the part of the spine being fused.

After the bone graft grows and fuses to the spine (after many months), the rods and screws are no longer needed for stability. However, most surgeons do not recommend removing them except in rare cases.

Risks and complications

As with any form of surgery, there are risks and complications associated with it. These include:

- Damage to the nerve root and the outer lining or covering which surrounds the nerve roots (dura). This is reported in less than 5% of cases (fewer than 5 out of 100 people). It may occur as a result of the bone being very stuck to the lining and tearing it as the bone is lifted off. Often the hole or tear in the dura is repaired with stitches or a patch. This could result in back or leg pain, weakness or numbness, leaking from the wound, headaches or, very rarely, meningitis;
- Leg pain (sciatica) as a result of scarring around the nerve root;
- Problems with positioning during the operation which might include pressure problems, skin and nerve injuries and eye complications including, rarely, blindness. A special gel mattress and protection is used to minimize this;
- Infection. Superficial wound infections may occur in 2 - 4% of cases (up to 4 out of 100 people). These are often easily treated with a course of antibiotics. Deep wound infections may occur and less than 1% of cases (fewer than 1 out of 100 people). These can be more difficult to treat with antibiotics alone and sometimes patients require more surgery to clean out the infected tissue. The risks may increase for people who have diabetes, reduced immune systems or are taking steroids;
- Bleeding. You must inform your consultant if you are taking tablets used to thin the blood, such as warfarin, aspirin or clopidogrel. It is likely you will need to stop taking them before your operation as they increase the risk of bleeding;
- Blood clots in the deep veins of the legs (DVT) or lungs (PE). This occurs when the blood in the large veins of the legs forms blood clots and may cause the leg to swell and become painful and warm to the touch. Although rare, if not treated this could be a fatal if the blood clot travels from the leg to the lungs, cutting off the blood supply to a portion of the lung. It is reported as happening in fewer than one out of 700 cases. There are many ways to reduce the risk of blood clot forming. The most effective is to get moving as soon as possible after your operation. Walk regularly as soon as you're able to, both in hospital and when you return home. Perform leg exercises described by your physiotherapist and keep well hydrated by drinking plenty of water.
- Difficulty with screw placement, including injury to the nerves or screw breakage;
- Bone graft non-union or lack of solid fusion (pseudoarthrosis). This can occur in up to 5% of cases (5 out of 100 people). See below for factors which can affect fusion cage / implant movement can occur in up to 2 out of 100 cases, with 1 out of 100 requiring re-operation. In extremely rare cases, cage movement can cause severe damage and cauda equina syndrome (paralysis, bladder or bowel incontinence);
- Although rare, the surgery may make your symptoms worse than before;

- Ongoing pain. Fusion surgery is a complex procedure and not all patients get complete pain relief; and
- There are also very rare but serious complications that in extreme circumstances might include damage to the cauda equina and paralysis (the loss of use of the legs, loss of sensation and loss of control of the bladder and bowel). This can occur through bleeding into the spinal canal after surgery (a haematoma). If an event of this nature was to occur, every effort would be made to reverse the situation by returning to theatre to wash out the haematoma. Sometimes, however, paralysis can occur as a result of damage or reduction of the blood supply of the nerves or spinal cord and this is unfortunately not reversible; and a stroke, heart attack or other medical or anaesthetic problems, including death, which is reported as happening and one out of 250,000 cases under general anaesthetic.

Factors which may affect spinal fusion and your recovery

There are a number of factors that can negatively impact on a solid fusion following surgery, including:

- smoking;
- diabetes or chronic illnesses;
- obesity;
- malnutrition;
- osteoporosis;
- post-surgery activities (see note on recreational activities); and
- long-term (chronic) steroid use.

Of all these factors, the one that can compromise fusion rate the most is smoking. Nicotine has been shown to be a bone toxin and inhibit the ability of the bone-growing cells in the body (osteoblasts) to grow bone. Patients should make a concerted effort to allow their body the best chance for their bone to heal by not smoking.

What to expect after surgery

Immediately after the operation you'll be taken on your bed to the recovery ward where nurses will regularly monitor your blood pressure and pulse. Oxygen will be given to you through a facemask for a period of time to help you to recover from the anaesthetic. You will have an intravenous drip for about 24 hours or until you are able to drink adequately.

A drain (tube) may come out of your wound if there has been significant bleeding during the operation. This prevents any excess blood or fluid from collecting there. The drain will be removed when the drainage has stopped, usually 24 hours later. You will have some discomfort or pain after surgery but the nursing and medical staff will help you to control this with appropriate medication.

On the first day after your operation, your physiotherapist or nurse will help you out of bed. They will also show you the correct way to move safely.

Going home

You will normally be allowed to leave hospital when you and your physiotherapist are happy with your mobility. This tends to be within 2 to 4 days after your operation.

Please arrange for a friend or relative to collect you, as driving yourself or taking public transport is not advised in the early stages of recovery.

Wound care

Your wound will most likely be closed with an absorbable suture. You may shower if you are careful when you get home but bathing should be avoided for two weeks, until the wound is completely dry. Please do not remove your wound dressing before two weeks. If it accidentally starts to come off you must present to your GP's nurse to have the dressing replaced.

Please contact your GP to report any of the following;

Redness around the wound;
Wound leakage; or
High body temperature.

Driving

Sitting for prolonged periods is not advisable after surgery and this includes driving. If you have no altered sensation or weakness in your legs then you may resume driving if you feel safe to do so but it is advisable not to travel for long distances without taking a break to stretch your legs.

Recreational activities

Walking is the best activity to do after your surgery. It promotes healthy circulation and aids the healing process. You should avoid activities which involve repetitive bending or twisting in the first few months. Sports should also be avoided until you can discuss them with your consultant during your follow-up appointment. Once the bone fuses, a gradual return to normal activity is then advised.

Work

You will need to be off work for six weeks. The rate at which you return will depend on how physical your job is. You will leave hospital with either an ACC certificate or an off work certificate detailing a graduated return to work.

Lifting and carrying

Heavy lifting and carrying should be avoided for the first few months after your surgery.

Follow up

You will leave with an appointment to attend clinic six weeks after your operation. If you have any queries before your follow-up date to please contact Dr Ratahi's PA.