

# Extreme Lateral Interbody Fusion (XLIF)

## Overview of the Operation

You will be positioned on either your right or left side after you have had your general anesthesia. An incision is made through the skin down to your abdominal muscles. This incision may be directly over the level of your spine, which needs to be fused. The surgery is then accomplished by splitting the abdominal muscles in line with their fibers. The abdominal contents within the peritoneum and psoas muscle over the vertebra are then palpated. At this point, we are able to directly position our retractor over the lateral aspect of the spine. We have an excellent view of this disc spaces in the spine. In the usual transpsoas interbody lumbar fusion, the size of the graft or interbody device is carefully matched to fit into the space between your vertebrae. The graft or device is then impacted into place, giving it as firm a fit as possible.

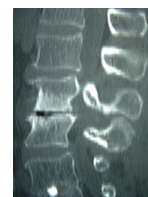
There is a new cage or interbody device technology for interbody fusion. When the cage is used, the bone graft or bone graft substitute is placed the device. The goal of this technique is to produce an improved interbody fusion mass. Whether or not the cage is used for bone grafting support, the principle is the same: over time the body will turn the bone graft and or substitute into a solid piece of bone and eliminate the movement between the vertebrae.

- **How is transpsoas lumbar fusion different from anterior or posterior lumbar fusion?**

In a posterior lumbar fusion, the fusion is done through the back part of the spine. The muscles are dissected from the spine. The bony surfaces of the spine are exposed and small pieces of bone are laid across the back part of the spine. In an anterior fusion, surgery is done through the front part of the spine, which makes it necessary for us to go through your abdomen. Instead of using chips of bone graft to span the space, a solid piece of bone is generally used, in the form of a shaped bone graft or metal cage filled with bone. In the anterior fusion, the bone graft is packed directly between the vertebral bodies, whereas in the posterior fusion the bone is laid across the back part of the spine. It is generally felt that if one can obtain a solid anterior fusion there is a mechanical advantage, in that most of the force of the spine is directly through the front part of the spine. The transpsoas lumbar fusion technique has the mechanical benefits of anterior fusion without the associated risk to vascular or abdominal contents. However, the transpsoas approach is not viable at the L5-S1 level and its' use may not be appropriate for your condition. Please discuss the pros and cons of this technique with your treating physician.

- **When is transpsoas fusion chosen instead of an anterior or posterior fusion?**

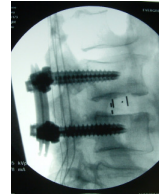
A transpsoas lumbar fusion is chosen for several reasons. Anatomically, it is best applied in the mid-lumbar region (L2-3, L3-4



and or L4-5). Your surgeon may feel that with new device and bone substitute technology your particular situation is best addressed via transposas lumbar interbody fusion. However, transposas fusion is also used in addition to a posterior instrumentation to obtain a higher percent of fusions. In certain spinal deformity situations, multiple discs are removed from the front of the spine to “loosen up” the spine and improve the correction of deformity.

- **What is a “Cage”?**

A cage is a synthetic device of variable shapes and materials that may be used to augment your spinal fusion. There are special tools to create the appropriate holes in the spine for insertion of the device. At this point, the vertebrae are being held apart by the device, which has holes on the outside. The bone graft or bone graft substitute is then packed into the middle part of this device and there is direct contact between the rough bony surfaces of the vertebrae and the graft through the holes that are on the outside of the device. This contact allows the fusion to occur. There are several brands of cages, but they all use basically the same principles.



- **Why are cages used?**

Once the cylinders are screwed into position, they give remarkably good fixation. This seems to alleviate the back pain quite quickly, as there is very little motion between the vertebrae after the cage is in place. It has also been documented that the fusion rate seems to be quite high. Without the cages, historically the fusion rate has been around 60-70%. At this point, it is felt that the fusion rate with the cages is over 90%. Another important reason to use the cages is that the bone graft comes in smaller pieces. There seems to be less pain at the bone graft donor site long-term if small pieces of bone are taken from the pelvis, rather than a large block of bone. Bone graft substitutes are often utilized.

- **Are there specific risks in using the cages?**

There are several risks of anterior lumbar fusions that we will discuss below. The only additional risk of using the cage in anterior lumbar fusion is that if the cage is placed too far backwards or too far to the side it can damage a nerve root. This is a rare complication and can be solved if the cage is removed. If the fusion does not take and the cage must be removed, then this can be somewhat of a challenging procedure. Often, however, the nonunion can be solved by doing a procedure from the back and leaving the cage in place.

- **Can the cage procedure be done through a laparoscope?**

Technology does exist whereby these cages can be inserted through multiple small incisions, in the abdomen, as opposed to one large incision. At the time of this writing, however this technique is still under investigational protocol. The results look promising and the surgery seems to be a little less painful, but it takes longer to perform, as it is not

quite as easy to expose the spine through a laparoscope. We feel that the main advantage to the laparoscope is less postoperative pain. We do not feel that the laparoscopic procedure particularly adds to the fusion rate. The pros and cons of open versus laparoscopic surgery should be discussed with your physician because there are pros and cons to the use of laparoscope depending on which level of your spine is being fused.

- **Does smoking have an effect on my fusion?**

Research shows that the healing rate is greater than 90% in non-smokers and less than 50% in smokers. It appears that with the cage technology the difference is not quite as great but there is still certainly a lower fusion rate in patients who smoke. In addition, there is a higher infection rate in patients who smoke. Many surgeons will not perform a fusion in patients who smoke because of the higher rate of nonunion and infection. Physicians have also found that it is sometimes necessary to go through both the front and the back of the spine to obtain a successful fusion in smokers. If you smoke, be prepared to discuss the situation in detail with your physician.

- **What will my hospital stay be like?**

You will check into the hospital approximately two hours before surgery. Several nurses and doctors will ask you questions regarding your medical history. It would be helpful to bring a list of medications that you are currently using. You will wait in the holding area of the operating room for about 30 minutes before surgery. This is where you will meet your anesthesiologist and have your IV's initiated.

After surgery you will wake up in the Recovery Area where you will remain for about two hours. There will be a catheter in your bladder. The catheter is usually removed on the 2<sup>nd</sup> day. However, if you are unable to urinate you may need to be recatheterized. Due to the anesthesia and medications, many patients have a poor recollection of this period.

The first 2 days will be difficult. It is common to have pain in the groin and down the front of your leg right after the surgery on the side that the surgery was performed. It resolves over 4-6 weeks.

We will try very hard to keep you as comfortable as possible with IV narcotics. You will be able to control the amount of pain medication you receive by using a small push button. You can push the button as often as you need; the machine will control the dose. We have been very happy with the amount of pain control we can obtain with this machine.

The combination of narcotics, anesthesia, and the spine surgery may cause you to experience some nausea. We allow only ice chips or small amounts of liquids until you are passing gas. If fed too soon, you may become distended and even more nauseated. About 20% of our patients are fairly nauseated within the first 24 hours. This problem is usually resolved by the second or third day.

We encourage you to get out of bed on the first or second day. By the third day we insist that you are ambulating. We have found that there is a lower incidence of lung, bladder, and vascular complications the earlier the patient is mobilized.

- **When can I shower?**

If drains are used, they are usually removed on the first or second day. You may shower with the dressings in place or off, depending on the preference of your doctor, on the second or third day. There are small pieces of tape on your skin that you will need to pull off after the tenth day. The sutures do not need to be removed, as they will eventually be absorbed into the skin.

- **When can I go home and what will I be able to do?**

You may go home once your pain can be controlled with pills, your incision is not draining, and your bowel and bladder are functioning normally. Most patients are ready to go home by the third or fourth day after surgery.

Within the first few weeks following discharge we encourage you to begin walking for one half hour to two hours each day. If you were given a brace, you must wear it during the day although you can remove it to sleep or shower. You should be able to go up and down stairs, drive, and perform basic daily activities without too much of a problem. You should avoid bending at the waist as that increases the stress across the fusion site. It usually takes a minimum of three to four months for the fusion to heal; most patients are in their braces for this entire time period. The time frame in which you can return to work depends on your recovery. Each patient has a unique set of work related issues, which will need to be discussed with the doctor.

The first office visit should be scheduled two to four weeks after you are discharged. The purpose of this visit is to check your incision and make sure you are progressing as planned. The second office visit is typically scheduled two to four months after surgery. During this visit the status of your fusion is assessed. Each physician has his own approach to rehabilitation, some more vigorous than others. Your physician will prescribe a rehabilitation program based on your specific needs.

- **Will I need a blood transfusion?**

A spinal fusion is a major surgery, which may require a blood transfusion. However, if you are having just a one or two level transposas fusion, the blood loss has been shown to be quite minimal. However, if the fusion is being done in conjunction with a posterior fusion, then a blood transfusion may be required. If you require blood, you can donate it yourself or use the blood bank. The blood bank is very safe; the risk of contracting AIDS is less than one in 50,000, and the risk of contracting Hepatitis is one in 10,000. Prior to surgery, our office will arrange pre-donations through the blood bank.

- **What are the specific risks of this operation?**

Every surgical procedure carries significant risks. These include major risks, which may have long-term negative side effects and minor risks, which do not have long-term effects.

### **Major Risks**

#### Deep Infection 1-2%

These include infections, which may show up several months after surgery and require multiple surgeries and prolonged use of antibiotic.

#### Pseudarthrosis 15-40%

A pseudarthrosis or non-union is a term used to describe a fusion that has not healed. This means that a solid bridge of bone has not formed between the vertebrae. A non-union does not necessarily mean that the surgery must be redone; many patients with a non-union are quite happy with their pain relief. However, in cases where the pain persists, the fusion may have to be redone. We have found that smokers have a higher incidence of pseudarthrosis (>50%) than non-smokers. Therefore, you should be aware that smoking could significantly affect the outcome of your surgery.

#### Pulmonary Embolism <5%

Occasionally a blood clot can form in your legs, break off, and travel to your lungs. Once the clot reached the lungs it is referred to as pulmonary embolism, which can be fatal. A pulmonary embolism is rarely found in spine surgery patients. If the clot is detected early it can be treated with blood thinners. The risks are much higher if you have a history of blood clots. Make sure that you inform your doctor of such a history.

#### Dural Tear <1%

Generally a dural tear can occur in conjunction with a posterior procedure. It would be unusual to encounter this complication from the front. To heal properly you must remain flat on your back for 24 to 72 hours, so that the leak will seal. If the leak persists, you may require further surgery or special drains.

#### Nerve Damage 1-2%

Nerve damage can occur in the front part of the spine if the cage is placed too far lateral to the vertebrae, which would put it very close to the nerve. This generally causes pain but occasionally causes numbness or weakness as well as pain. It would be rare to have a catastrophic complication of lost bowel or bladder function, but it is possible if perchance the disc material is pushed straight back into the spinal cord.

#### Re-operation 10-20%

Further surgeries may be necessary if the hardware breaks or loosens. Other reasons include nerve impingement from a screw, pseudarthrosis (non-healing of the fusion), infection, or persistent pain.

#### Major organ or vessel damage:

With the transposas procedure there is the additional risk of perforation of the aorta or inferior vena cava. These are major vessels and this could cause major blood loss. Generally this can be stopped in surgery and

repaired. In very rare instances, this major bleeding could lead to death. It is also possible to damage the tubes coming from your kidney to your bladder, which would require additional surgery to repair.

### **Minor Risks**

Complications, which are less serious, include bladder infection, superficial wound drainage, inability to urinate for a few days, nausea, headache, constipation, abdominal bloating, sore throat, pneumonia, and reactions to medications. If your body is unable to replenish its blood supply or if too much blood is lost during surgery, a blood transfusion may be necessary. As with any surgery, there are also unanticipated major and minor risks.

#### **○ What is your overall philosophy regarding spinal fusion?**

Lumbar fusion is generally an elective surgery. Therefore it is your choice to proceed based on your current level of discomfort and disability. We recommend that you do not have surgery if you can live with your current level of pain or can make changes in your lifestyle to decrease the pain. If you have made a valiant effort and the pain still persists, surgery should be your next step.

The rate of surgical success varies greatly depending on your exact problem, overall health, and the magnitude of surgery necessary. We hope that by providing you with as much information as possible about the surgery, you can determine if the pain you are experiencing is worth the risk of surgery.

### **Final Comments:**

Patients often ask if the purpose of this letter is to provide the surgeon with legal and medical protection. This is true; however, the main goal of this letter is to provide you with as much information as possible to assist you during your decision making process. We believe that patients who are more informed about the procedure are less anxious and apprehensive with their surgery. These patients usually experience less pain and have better outcome overall.

Enclosed are two copies of this letter. Keep one copy for your record, sign and return the other copy to our office. If you have additional questions please feel free to ask your surgeon and his staff. We look forward to continuing to work with you.

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