ANTERIOR LUMBAR INTERBODY FUSION (ALIF)

Anterior – In human anatomy, referring to the front surface of the body or the position of one structure relative to another

Lumbar – Relating to the loins or the section of the back and sides between the ribs and the pelvis. In the spinal column, the last five vertebrae (from superior to inferior, L1-L5)

Interbody – Material inserted between two vertebral bodies to reestablish and maintain disc height

Fusion – Surgically induce union or healing of bone

Basic Anatomical Landmarks:
Anterior Lumbar Spine

Anterior View of the Abdominal Cavity
(The spine is located behind these structures)
ANTERIOR LUMBAR INTERBODY FUSION (ALIF)

Basic Anatomical Landmarks:
Anterior Lumbar Spine

The surgical approach to the interbody space is from the anterior (through the abdomen).

Anterior View of L5-S1
The most common level for an ALIF procedure
ANTERIOR LUMBAR INTERBODY FUSION (ALIF)

Approach/Patient Positioning

The Anterior Lumbar spine may be approached through a Transperitoneal or Retroperitoneal exposure:

**Transperitoneal** – A surgical exposure created by passing through the abdominal cavity. The transperitoneal approach may be performed open or laparoscopically. In this approach, the surgeon makes a skin incision, dissects through the subcutaneous tissue, fascia and muscles, and incises the anterior abdominal peritoneum to enter the abdominal cavity. Resection of the abdominal viscera (internal organs) is performed and the surgeon incises the posterior peritoneum to expose the great vessels (aortic artery, vena cava vein and common iliac arteries and veins) and anterior aspect of the spine.

**Retroperitoneal** – A surgical exposure created by going behind the abdominal cavity. In this approach, the peritoneal sac of the abdomen is mobilized (made free from other tissue) and retracted laterally (to the side). The peritoneum is dissected away from the great vessels and the anterior spine is exposed without entering the abdominal cavity.

The **peritoneum** is a thin membrane, which encircles the entire abdominal cavity: think of the abdominal cavity as a balloon. The internal viscera are contained within the peritoneum (essentially like a balloon holds air, the peritoneum encloses the abdominal cavity).
ANTERIOR LUMBAR INTERBODY FUSION

Technique: Impacted ALIF

Intraoperative, the patient is placed on the operating table in the supine position. The spine may be extended slightly at the surgeon's direction.

Either a transperitoneal or an anterior retroperitoneal approach is suitable. The amount of great vessel release and retraction should be limited to that required for insertion of the instruments and constructs. Ligation of segmental vessels is not usually required. At L5-S1, the middle sacral artery is typically ligated and divided. Care should be taken at L5-S1 to only use blunt dissection in order to minimize injury to the presacral neural plexus.

The surgical approach to the interbody space is from the anterior (through the abdomen).
ANTERIOR LUMBAR INTERBODY FUSION

Technique: Impacted ALIF

Straight Approach

A block discectomy is required. The disc is removed and the endplates are prepared for allograft insertion. An anterior release may be required in some situations to obtain appropriate disc height and lordosis.

A chosen interbody allograft is placed in the L5-S1 disc space according to the specific surgical technique for the device. Ensure that the interbody allograft is adequately recessed within the disc space. Anterior osteophytes adjacent to the interspace must be removed in order to ensure accurate seating of the graft containment plate to the vertebral body.
ANTERIOR LUMBAR INTERBODY FUSION

Technique: Impacted ALIF

Often, additional fixation is achieved with posterior pedicle screws; however, the ideal solution would be to have anterior supplemental rigid fixation device that helps provide immediate fixation, which obviates the need for a second surgical procedure. Often at L5-S1, this can be achieved with an anterior plate.

The primary design for a rigid anterior lumbosacral fixation device is to protect the major vasculature and to help achieve internal fixation of the spine that is comparable to the fixation achieved with pedicle screws.

Eighty percent of patients have a bifurcation of the iliac vessels 1cm or more above the L5-S1 disc space, with a safe zone that would accommodate an anterior screw plate. The vast majority of patients are viable candidates for this type of construct.
ANTERIOR LUMBAR INTERBODY FUSION

Technique: Impacted ALIF

Oblique Approach
A block discectomy is required. The disc is removed and the endplates are prepared for allograft insertion. An anterior release may be required in some situations to obtain appropriate disc height and lordosis.

Block Discectomy at L4-L5
ANTERIOR LUMBAR INTERBODY FUSION

Technique: Threaded Cylindrical Cages

Threaded Cylindrical Cages

Intraoperative, the patient is placed on the operating table in the supine position. The spine may be extended slightly at the surgeon's direction.

Either a transperitoneal or an anterior retroperitoneal approach is suitable. The amount of great vessel release and retraction should be limited to that required for insertion of the instruments and constructs. Ligation of segmental vessels is not usually required. At L5-S1, the middle sacral artery is typically ligated and divided. Care should be taken at L5-S1 to only use blunt dissection in order to minimize injury to the presacral neural plexus.

The surgical approach to the interbody space is from the anterior (through the abdomen).
ANTERIOR LUMBAR INTERBODY FUSION

Technique: Threaded Cylindrical Cages

Block Discectomy at L5-S1
A standard block discectomy is recommended. The disc is removed and the endplates are prepared for cage insertion.

Implanted Cylindrical Cages
Anterior Cylindrical Cages implanted at L5-S1: these are labeled as stand alone devices.

BRIEF SUMMARY OF INDICATIONS, CONTRAINDICATIONS, AND WARNINGS FOR THE INTER FIX™ THREADED FUSION DEVICE AND THE INTER FIX™ RP THREADED FUSION DEVICE – REDUCED PROFILE:
The INTER FIX™ Threaded Fusion Device and the INTER FIX™ RP Threaded Fusion Device are indicated for spinal fusion procedures in skeletally mature patients with degenerative disc disease (DDD) at one level from L2-S1, and may also have up to Grade I spondylolisthesis or retrolisthesis at the involved level. INTER FIX™ devices and INTER FIX™ RP devices are to be used with autogenous bone graft and implanted via an open anterior approach. Patients receiving the INTER FIX™ and INTER FIX™ RP Threaded Fusion Devices should have had at least six months of nonoperative treatment prior to treatment with the INTER FIX™ or INTER FIX™ RP devices. The INTER FIX™ and INTER FIX™ RP Threaded Fusion Device should not be implanted in patients with an active infection at the operative site or with an allergy to titanium or titanium alloy.

The INTER FIX™ and INTER FIX™ RP Threaded Fusion Devices should only be used by surgeons who are experienced in spinal fusion procedures and have undergone adequate training with this device. A lack of adequate experience and/or training may lead to a higher incidence of adverse events such as vascular injuries, neurological events, and/or urogenital events (including retrograde ejaculation).

Two INTER FIX™ Threaded Fusion Devices should be implanted side by side at the surgical level. The INTER FIX™ RP Threaded Fusion Device must be implanted side by side at the surgical level with the INTER FIX™ Threaded Fusion Device or with a second INTER FIX™ RP Threaded Fusion Device. The longitudinal groove on the INTER FIX™ RP device facilitates implanting two devices in closer proximity than that which is manageable with two INTER FIX™ devices, thus resulting in a reduced lateral profile.

CAUTION: Federal law (USA) restricts this device to sale by or on the order of a physician with appropriate training or experience.

Please see the package insert for the complete list of indications, warnings, precautions, adverse events, clinical results, definition of DDD, and other important medical information.
ANTERIOR LUMBAR INTERBODY FUSION

Technique: Threaded Lordotic Cages

Threaded Lordotic Cages

Intraoperative, the patient is placed on the operating table in the supine position. The spine may be extended slightly at the surgeon’s direction.

Either a transperitoneal or an anterior retroperitoneal approach is suitable. The amount of great vessel release and retraction should be limited to that required for insertion of the instruments and constructs. Ligation of segmental vessels is not usually required. At L5-S1, the middle sacral artery is typically ligated and divided. Care should be taken at L5-S1 to only use blunt dissection in order to minimize injury to the presacral neural plexus.

The surgical approach to the interbody space is from the anterior (through the abdomen).

Supine Position

Anterior Exposure of L5-S1
ANTERIOR LUMBAR INTERBODY FUSION

Technique: Threaded Lordotic Cages

Anterior Lordotic Cages implanted at L5-S1: these devices are labeled as stand alone devices.

BRIEF SUMMARY OF INDICATIONS, CONTRAINDICATIONS, AND WARNINGS FOR:
INFUSE® BONE GRAFT/LT-CAGE® LUMBAR TAPERED FUSION DEVICE

The INFUSE® Bone Graft/Interbody Fusion Device is indicated for spinal fusion procedures in skeletally mature patients with degenerative disc disease (DDD) at one level from L2-S1 who may also have up to Grade 1 spondylolisthesis or Grade 1 retrolisthesis at the involved level. The INFUSE® Bone Graft/LT-CAGE® Lumbar Tapered Fusion Device (Flat Nose) is to be implanted via an anterior open or an anterior laparoscopic approach. The INFUSE® Bone Graft/LT-CAGE® Lumbar Tapered Fusion Device (Round Nose) is to be implanted via an anterior open approach.

The INFUSE® Bone Graft component must not be used without the Interbody Fusion Device component. These components must be used as a system.

NOTE: LT-CAGE® Lumbar Tapered Fusion Device implants are not to be used in conjunction with either the INTER FIX™ OR INTER FIX RP implants to treat a spinal level.

The INFUSE® Bone Graft/Interbody Fusion Device is contraindicated for patients with a known hypersensitivity to recombinant human Bone Morphogenetic Protein-2, bovine Type I collagen or to other components of the formulation and should not be used in the vicinity of a resected or extant tumor, in patients with any active malignancy or patients undergoing treatment for a malignancy, in patients who are skeletally immature, in pregnant women, or in patients with an active infection at the operative site or with an allergy to titanium or titanium alloy.

Antibody formation to rhBMP-2 or its influence on fetal development has not been assessed. The safety and effectiveness of this device has not been established in nursing mothers. Women of child-bearing potential should be advised to not become pregnant for one year following treatment with this device.

Please see the package insert for the complete list of indications, warnings, precautions, adverse events, clinical results, definition of DDD, and other important medical information. The package insert also matches the sizes of those sized devices that are indicated for use with the appropriate INFUSE® Bone Graft kit.

CAUTION: Federal (USA) law restricts this device to sale by or on the order of a physician with appropriate training or experience.