LUMBAR FUSION SURGERY

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INDICATIONS OF LUMBAR FUSION

Surgical treatment of Deg lumbar spine may be indicated in patients with symptoms not responding to non-operative measures.

Instability— Spondylolysis, Spondylolisthesis, Post laminectomy

Disc and facet degeneration

Deformity requiring correction

TECHNIQUES OF LUMBAR

Interbody Fusion

- Anterior Lumbar Interbody Fusion
- Posterior Lumbar Interbody Fusion
- Transforaminal Lumbar Interbody fusion

Posterior/Posterolateral Fusion

ADVANTAGES OF INTERBODY FUSION

Greater surface area for fusion

Vascularity of vertebral body favours fusion

Biomechanically compression forces across vertebral bodies encourages fusion

Easier to evaluate interbody fusion as compared to posterolateral fusion

Techniques of Interbody Fusion:

Anterior Lumbar Interbody fusion

Posterior Lumbar Interbody fusion

Transforaminal Lumbar Interbody Fusion

ANTERIOR LUMBAR INTERBODY FUSION (ALIF)

Indications:

- Degenerative Disc Disease
- Spondylolysis, Spondylolisthesis
- Degenerative scoliosis
- Long Fusion to sacrum
- Postlaminectomy syndrome
- Failed previous Posterolateral fusion

ALIF Approach:

Left Retroperitoneal approach

Transperitoneal approach

ANTERIOR LUMBAR INTERBODY FUSION (ALIF)

Advantages:

- Removes the pain source i.e. the disc.
- Excellent disc space visualisation and clearance
- Restores disc height-indirect foraminal decompression
- Restores Lumbar lordosis
- Posterior spinal muscle is not damaged
- Decreased infection rate

Contraindications with potential risks:

- Previous anterior abdominal surgery with possible adhesions

POTENTIAL COMPLICATIONS

Intraoperative vascular injury-3%

Retrograde ejaculation- 2%

Ureteral Injury- 1%

Rectus muscle haematoma

Impotence

Incisional hernia

Rectus muscle denervation

Retroperitoneal fibrosis

Femoral Nerve palsy

DVT- 1%

VASCULAR ANATOMY-LUMBOSACRAL JUNCTION

1-Sup hypogastric plexus

2-Aorta

3-Common iliac artery

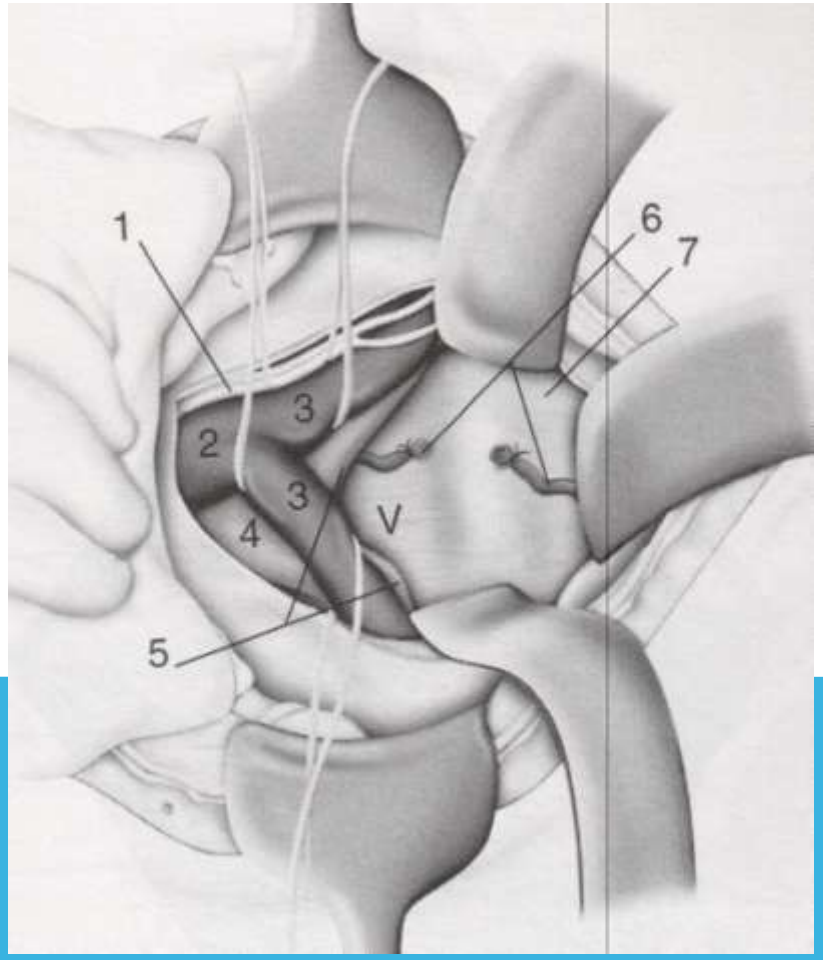
4-Inferior vena cava

5-Common iliac vein

6-median sacral artery/vein

7-sacrum

V-L5 vertebrae



POSTERIOR LUMBAR INTERBODY FUSION/ TRANSFORAMINAL LUMBAR INTERBODY FUSION

Indications:

- Deg Disc Disease/Massive disc prolapse
- Spondylolysis/Spondylolisthesis
- Postdiscectomy/Postlaminectomy syndrome
- Deg Spinal Stenosis

Advantage over ALIF:

- Can be done in pts with previous anterior surgery
- In those with anomalous vascular anatomy
- Avoids anterior approach related complications

PLIF/TLIF

Effective disc space clearance is achieved

Interbody cage provides anterior support

Restores disc height and lordosis

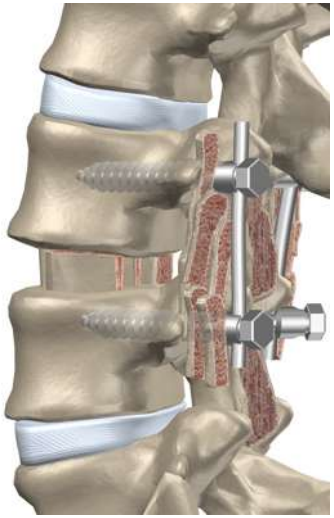
Correction of lumbar lordosis

Risks:

Dural Tear
Nerve injury
Epidural fibrosis
Paravertebral muscle injury

POSTERIOR LUMBAR INTERBODY FUSION

Excision of the degenerate disc



direct neural decompression

Restoration of the foraminal height

Interbody fusion, better saggital balance*

Spinal Unit
UNIVERSITY HOSPITAL OF NORTH TEES

TECHNIQUE PLIF

Muscle stripping to facets

Pedicle screws

Subtotal facetectomy

Bilateral cage insertion

Autologous Bone grafting

PLIF/TLIF

PLIF Cloward Posterior midline incision	TLIF Harms and Rolinger Posterior midline incision
Medial edge of facet removed	Total facetectomy of surgical level
Nerve retraction during cage insertion	Minimal nerve retraction
Bilateral	Unilateral/bilateral

LUMBAR SPINE FUSION

Transforaminal Lumbar Interbody Fusion TLIF Surgery.mp4

POSTEROLATERAL FUSION

Bony fusion between Transverse processes and sacral ala

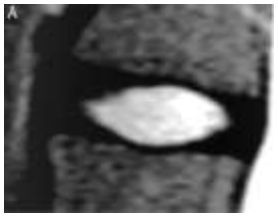
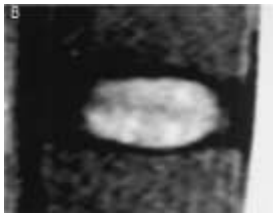
Indication

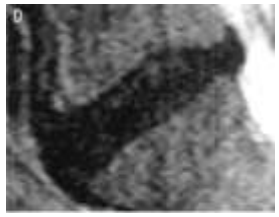
- Spondylolysis/Spondylolisthesis
- After extensive laminectomy

Disadvantages

- Smaller area of fusion wrt interbody fusion
- Not indicated for severe deformity
- ↓ effectiveness for discogenic pain

PFIRRMANN CLASSIFICATION




Grade1	Grade II	Grade III	Grade IV	Grade
Homogenous Disc with Bright signal	Bright signal but inhomogenous	Inhomogenous signal with intermediate gray signal disc height is normal or slightly decreased	Inhomogenous, signal, dark gray disc signal, disc height moderately decreased, annulus and nucleus not distinct	Inhomogenous dark signal from the disc, loss of disc height

JW-38YRS MALE

Back and bilateral leg pain 6 years. Did not benefit from non-operative treatment.

L5/S1 Degenerate disc with small central disc bulge

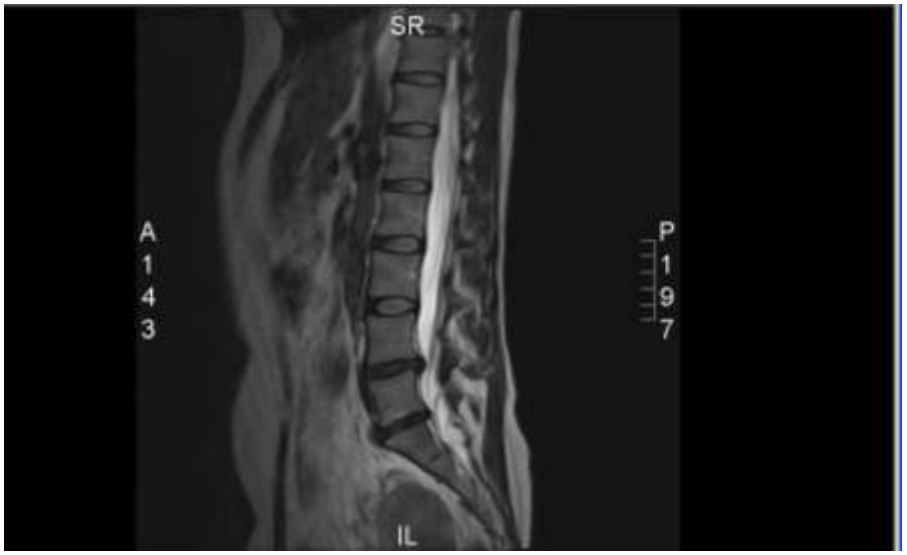
JW-38YRS MALE

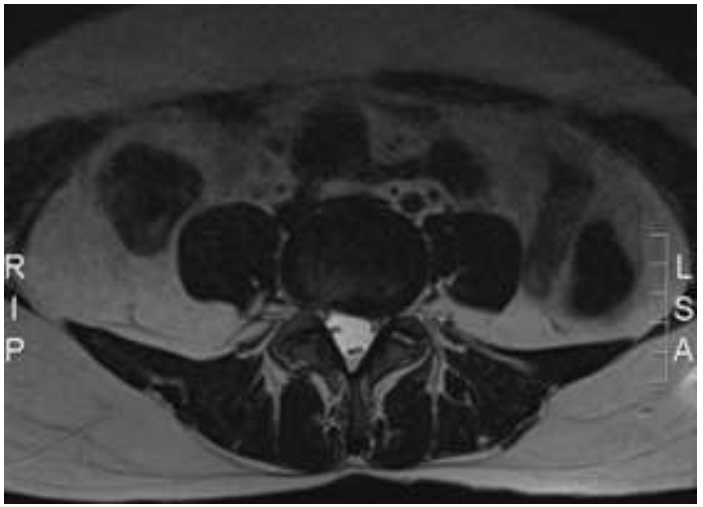
6 months postop. Reports 80-90% better.
Back to work as a Chef in a Fish & Chips shop

L5/S1 interbody Fusion

ST FEMALE, 42YRS

BACK PAIN WITH BILATERAL LEG PAIN FOR 4 YRS.





Degenerate Disc L4/5 and L5/S1

ST 42YRS FEMALE

6months following surgery, much better happy with result of the procedure.

L4/5,L5/S1 Interbody fusion

MEYERDING'S SCALE

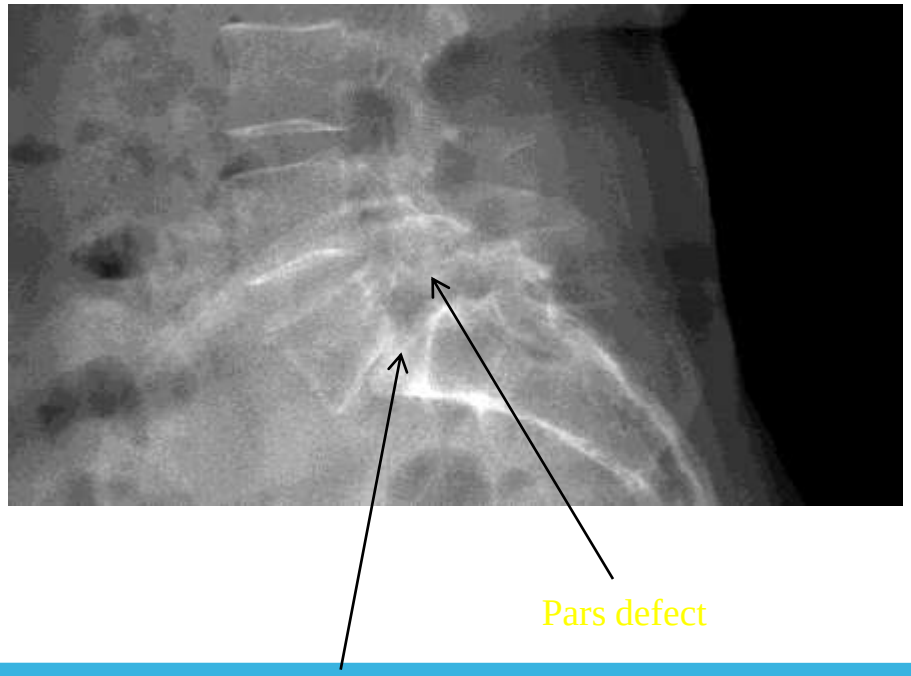
Grade I <25%

Grade II 25-50%

GradeIII 50-75%

GradeIV 75-100%

GradeV Spondyloptosis



CLASSIFICATION

WILTSE NEWMAN MCNABB

I- Dysplastic

II- Isthmic – IIa- lytic, IIb- elongated pars, IIc- acute stress fracture

III- Degenerative

IV- Traumatic – never involves the pars

V- Neoplastic

VI- Iatrogenic (Later addition)

ISTHMIC

Grade IV isthmic lytic SPL
(Type IIa)

CLINICAL PRESENTATION
IN DEG SPL

Radiculopathy & Spinal Claudication (68%)

Back ache (32%)

Neurology (Rare)

THANK YOU FOR LISTENING