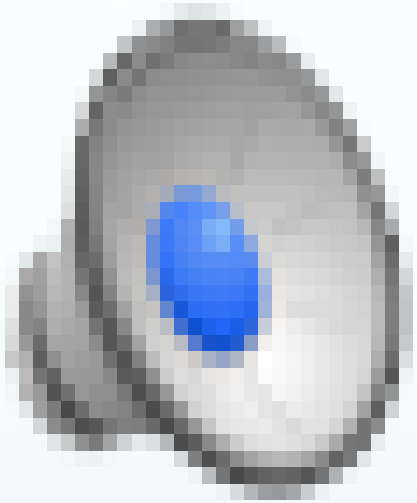
Recent Advances in Neurospinal Surgery

Percutaneous Vertebroplasty (PVP) and Kyphoplasty (PKP)

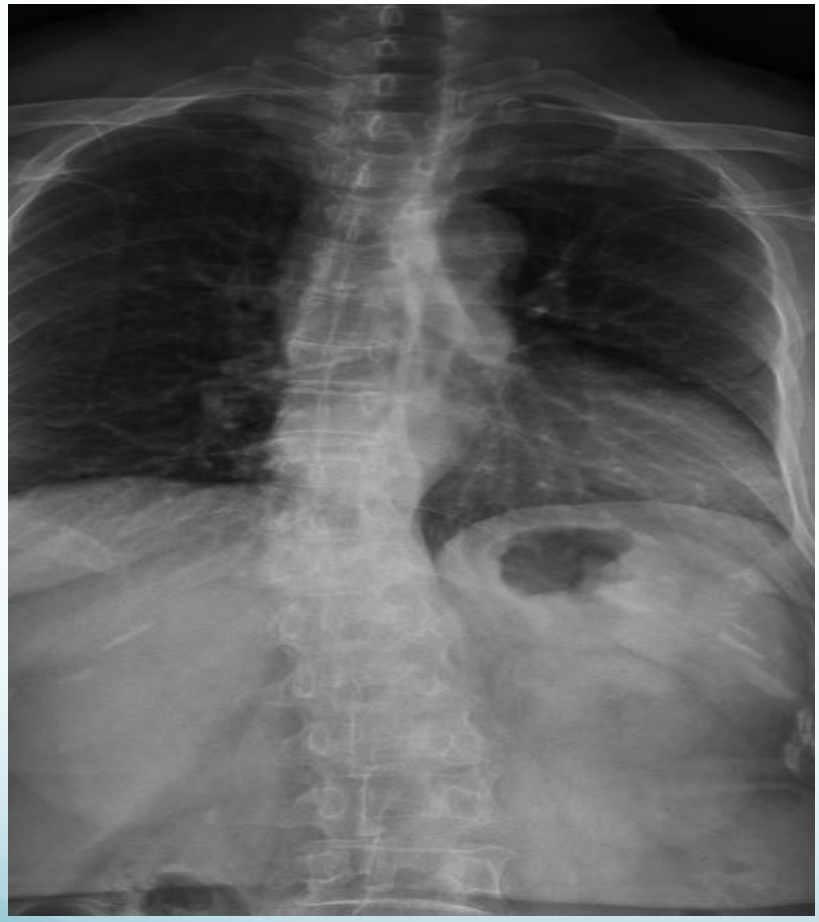
- Minimally invasive, image-guided (C-arm)
- Osteoporotic or malignant compression/bursting fractures, vertebral hemangiomas.
- Immediate pain relief, increase patient mobility, decrease narcotic needs, and prevent further vertebral collapse.
- Percutaneous injection of a cement, polymethylmethacrylate (PMMA), into the vertebral bodies.
- Kyphoplasty provides further height restoring to the compressed vertebral body.
- https://www.youtube.com/watch?v=_lUhQLFHriw

PMMA

High Viscosity PMMA (Confidence)



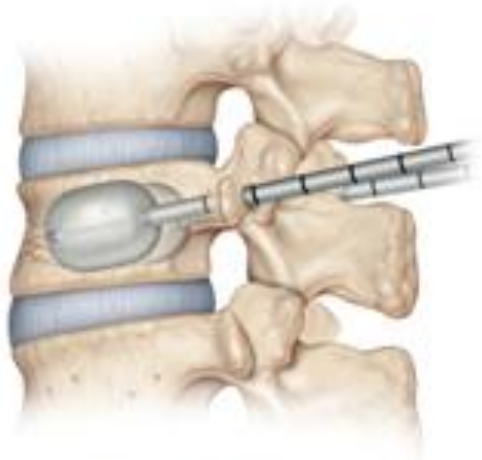
PVP (T9 compression fracture)-1



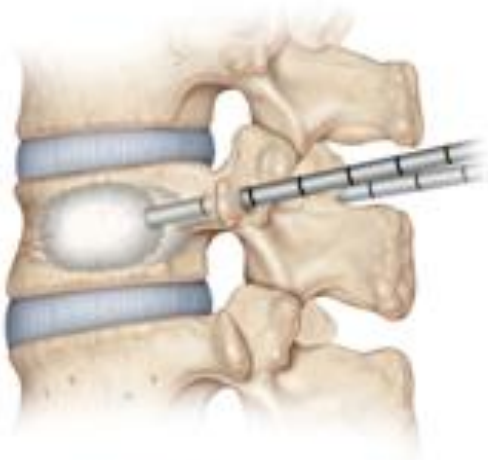
PVP (T9 compression fracture)-2

Balloon Kyphoplasty

Fracture



Balloon Inflation

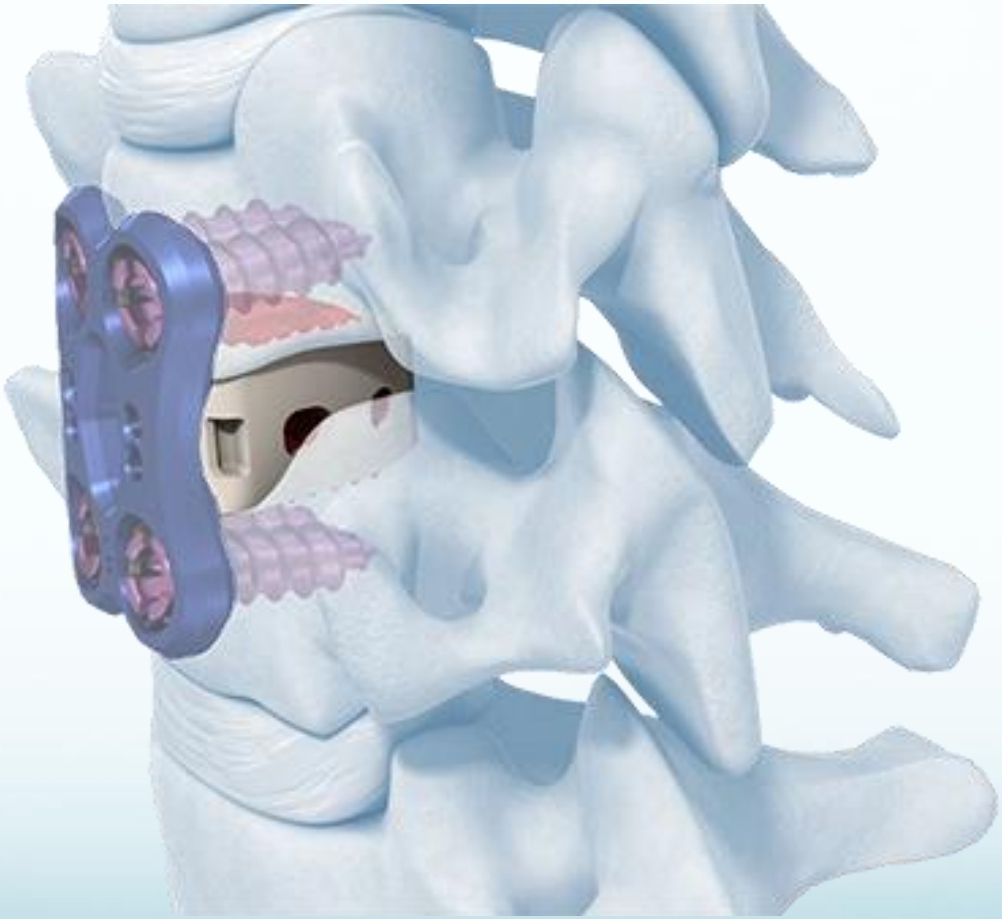


Cement Injection

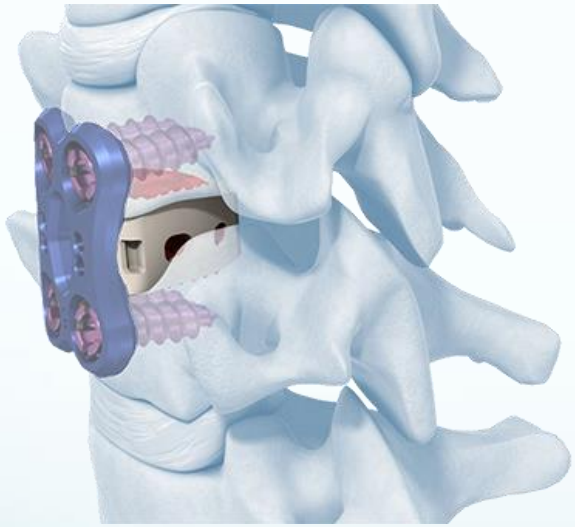
PKP (L1 bursting fracture)-1

PKP (L1 bursting fracture)-2

Rigid Plate Fixation with Cage Fusion



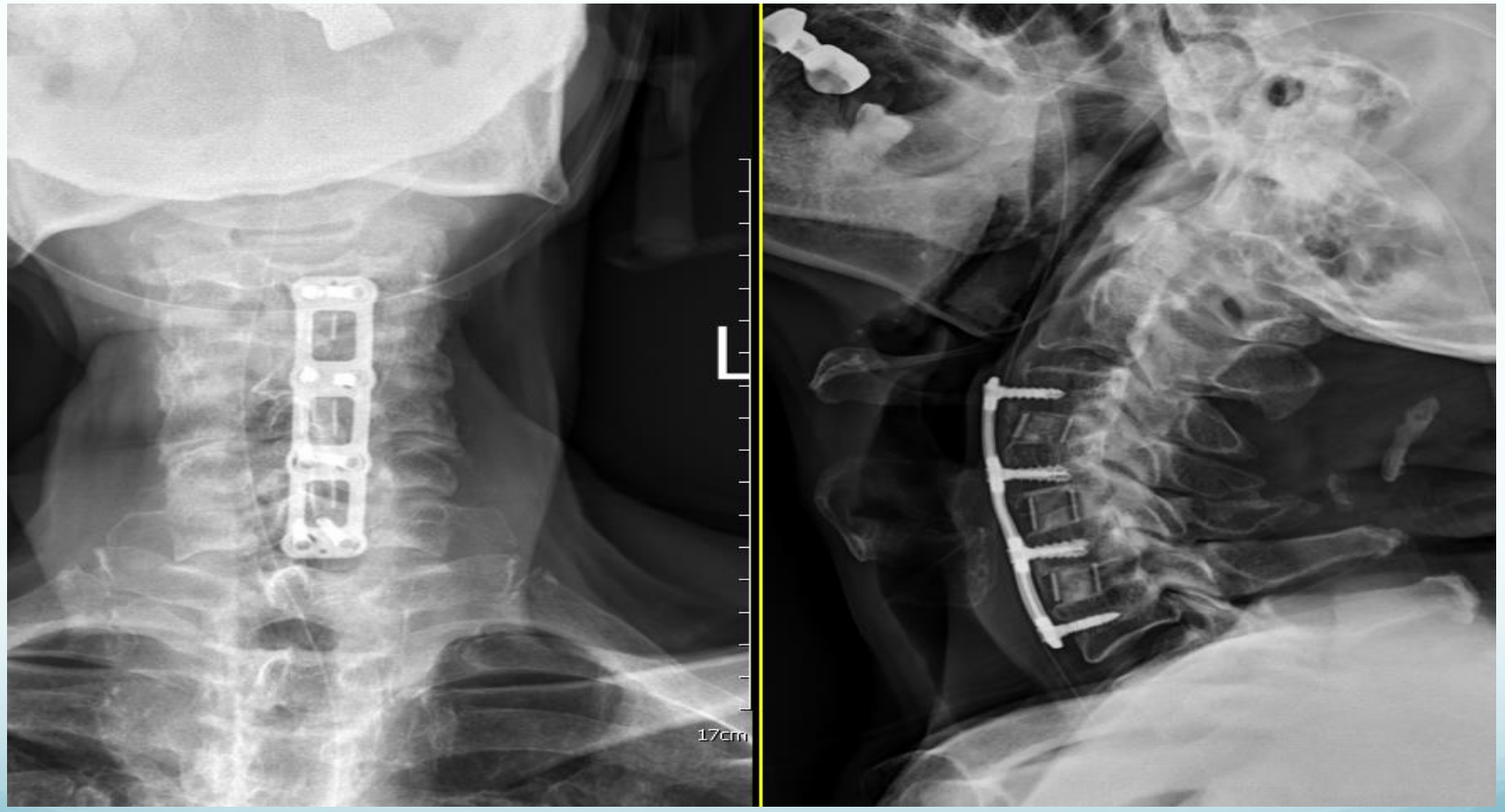
Rigid Plate Fixation with Cage Fusion



- https://www.youtube.com/watch?v=vAQn4XXDga0
- https://www.youtube.com/watch?v=n-pjZxEy6Rw
- https://www.youtube.com/watch?v=yfSkOF_DAfA

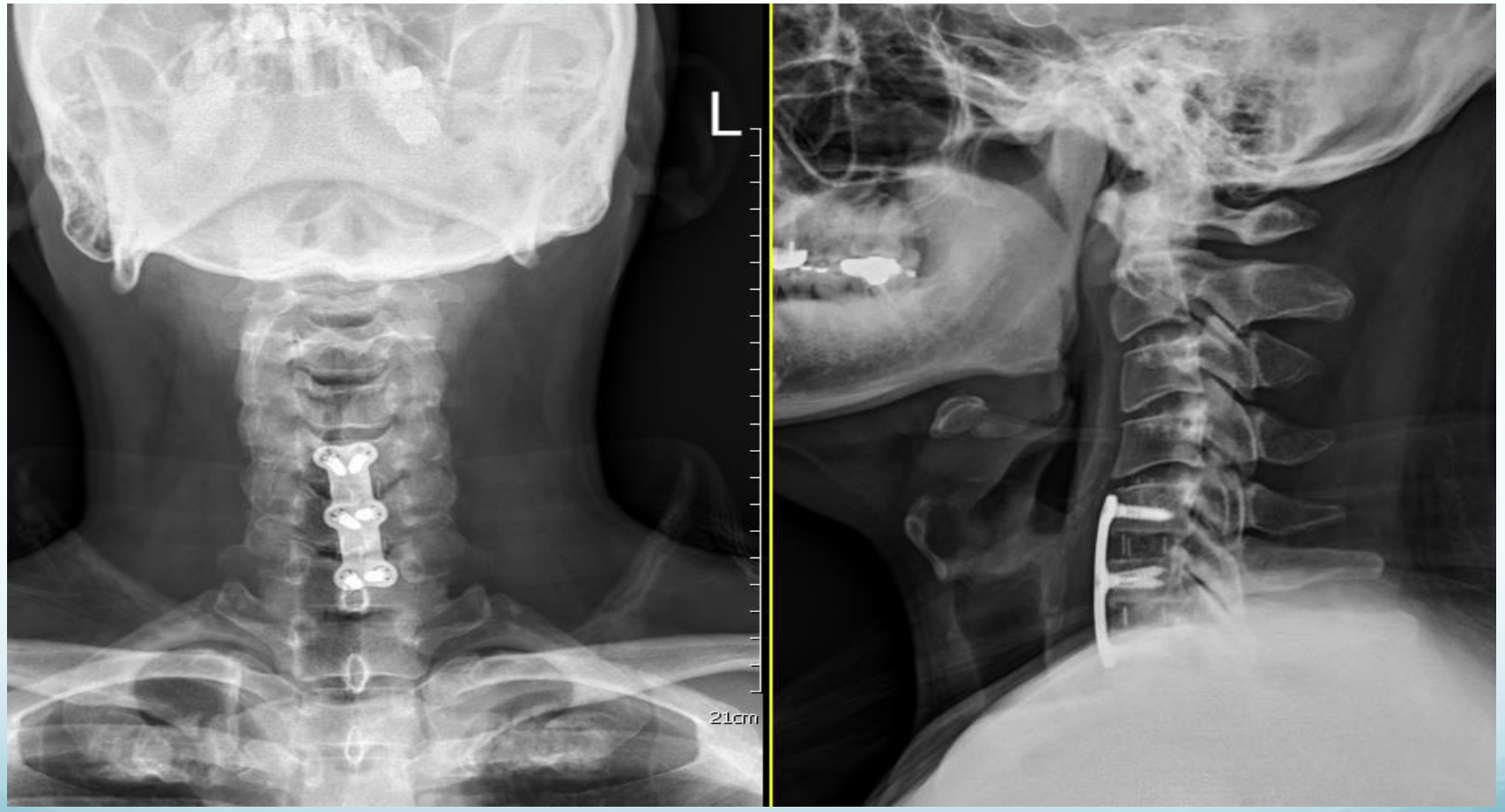
Plate Cage Fixation (C3-6)-1

Plate Cage Fixation (C3-6)-2

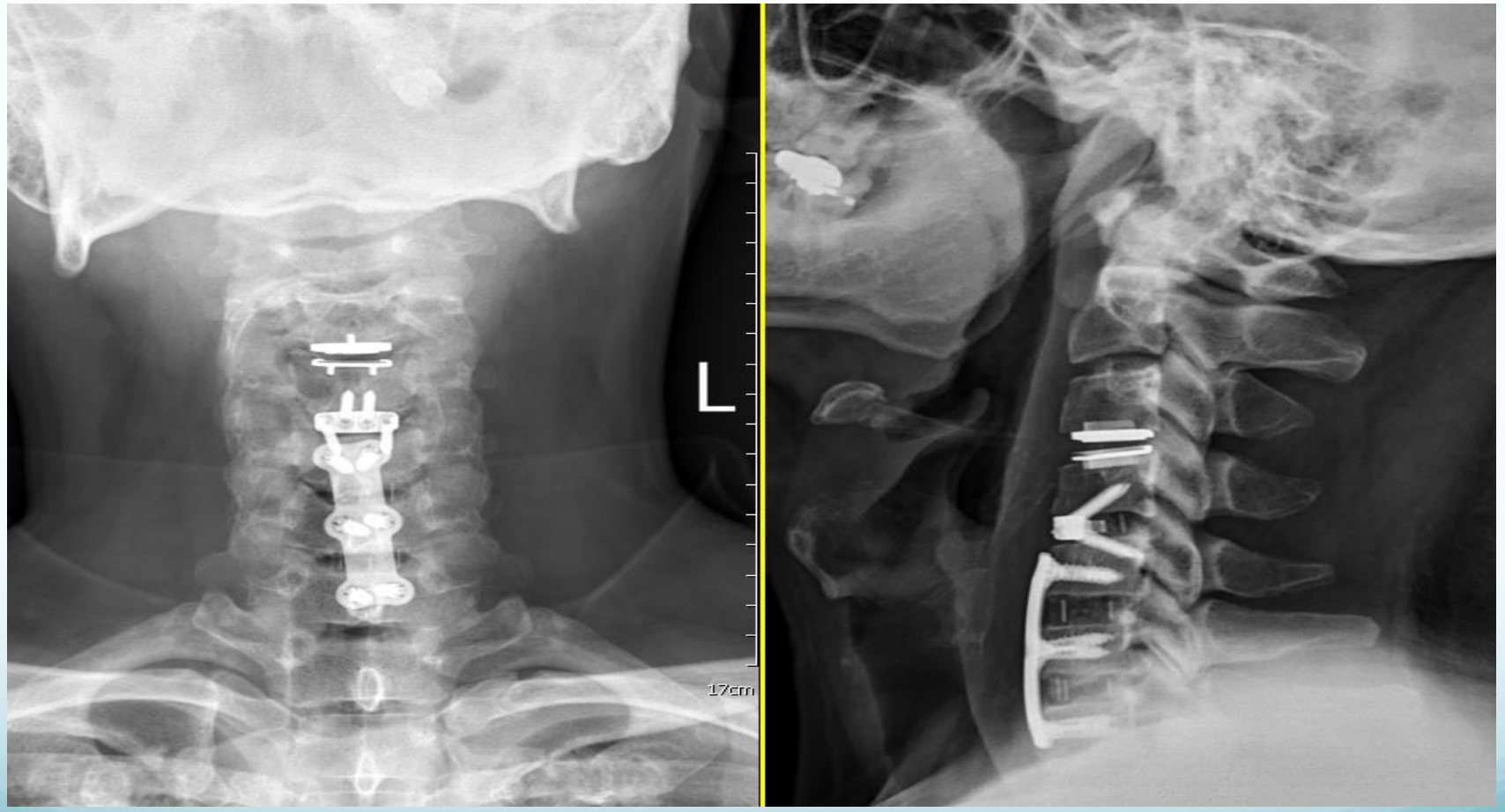


Zero-P Plate Fixation with Cage Fusion

Zero-P with cage fixation (C4/5)-1

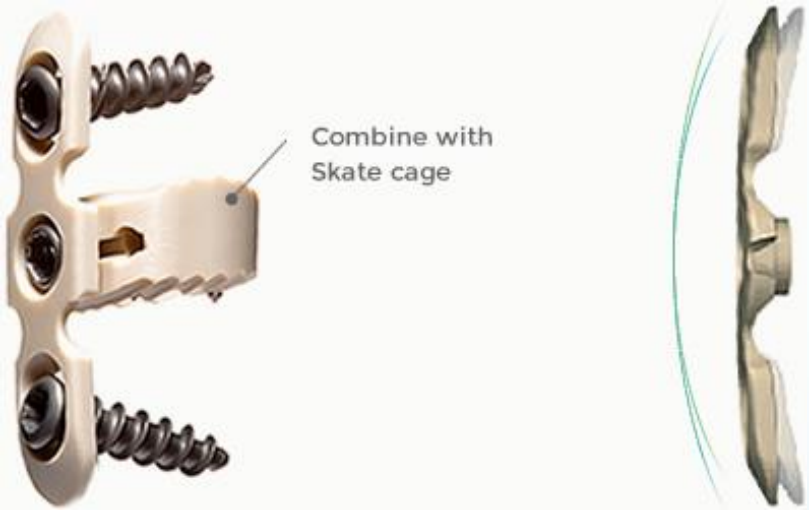


Zero-P with cage fixation (C4/5)-2

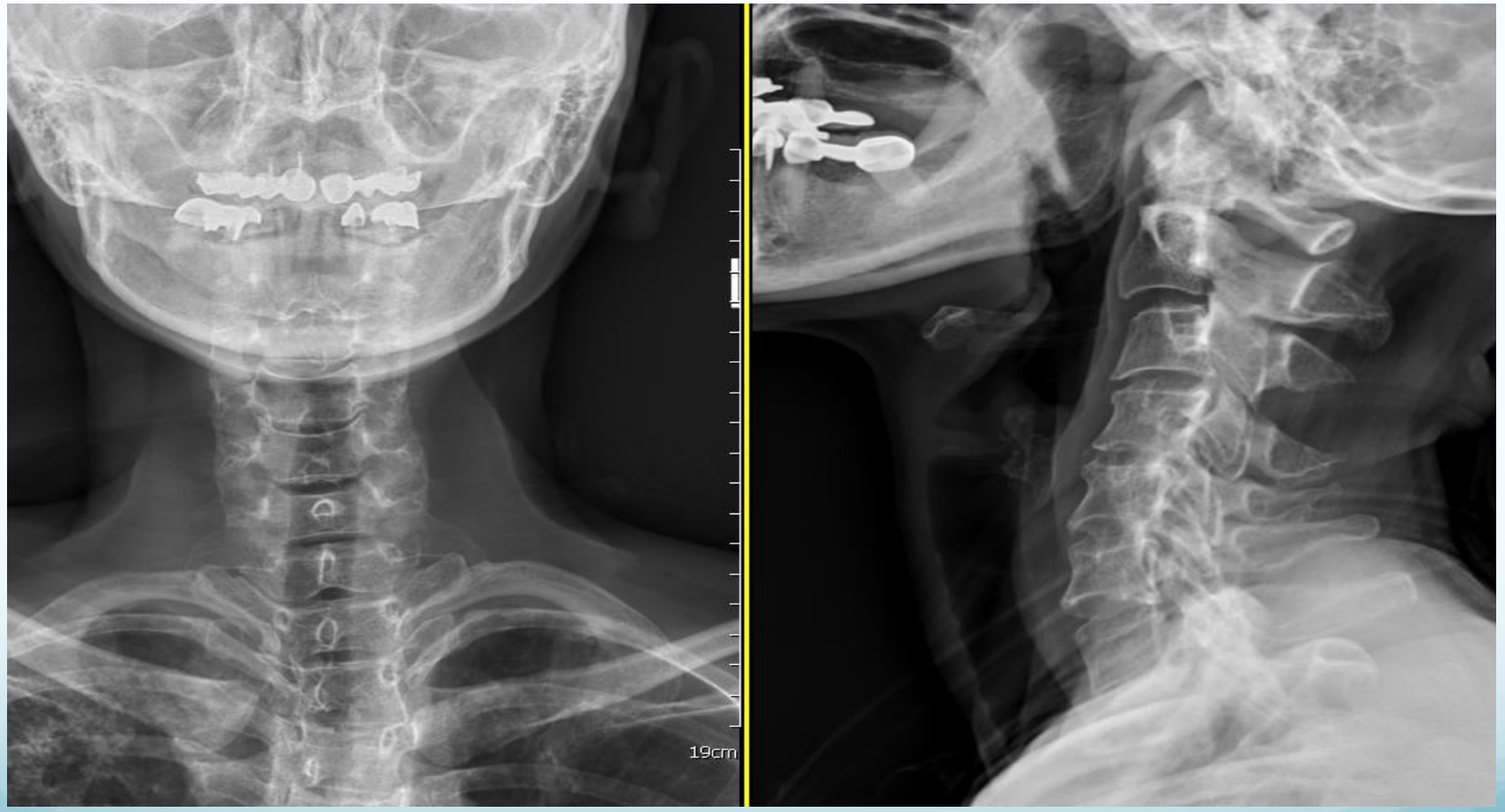


Skate (SK) Cervical Plate with Cage

- Fusion with more stability
- Anatomical fixation
- Simplicity
- Multi-level implantation
- Anti-backout locking


Combine with
Skate cage

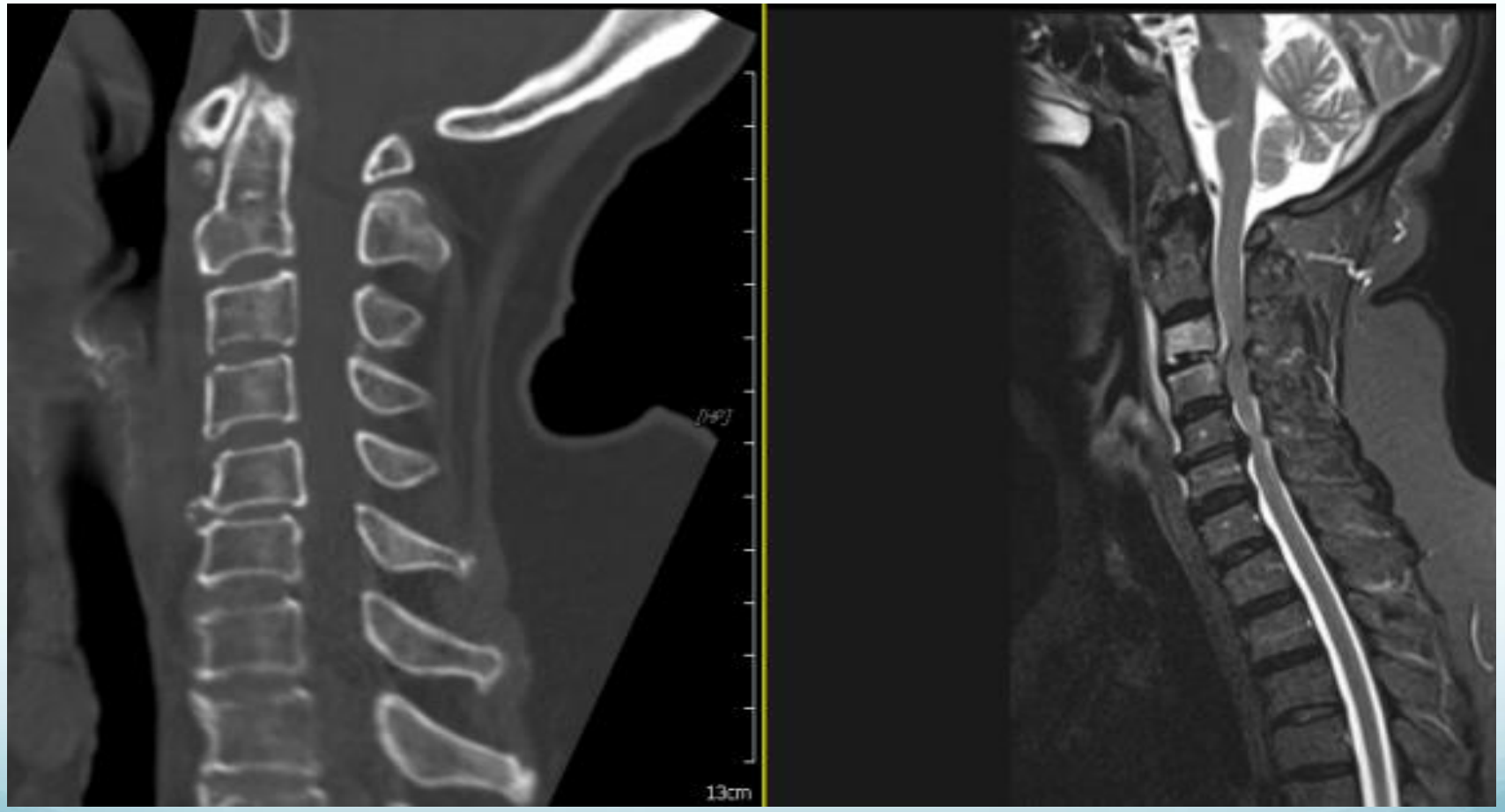
SK plate cages fusion fixation (C3-6)-1



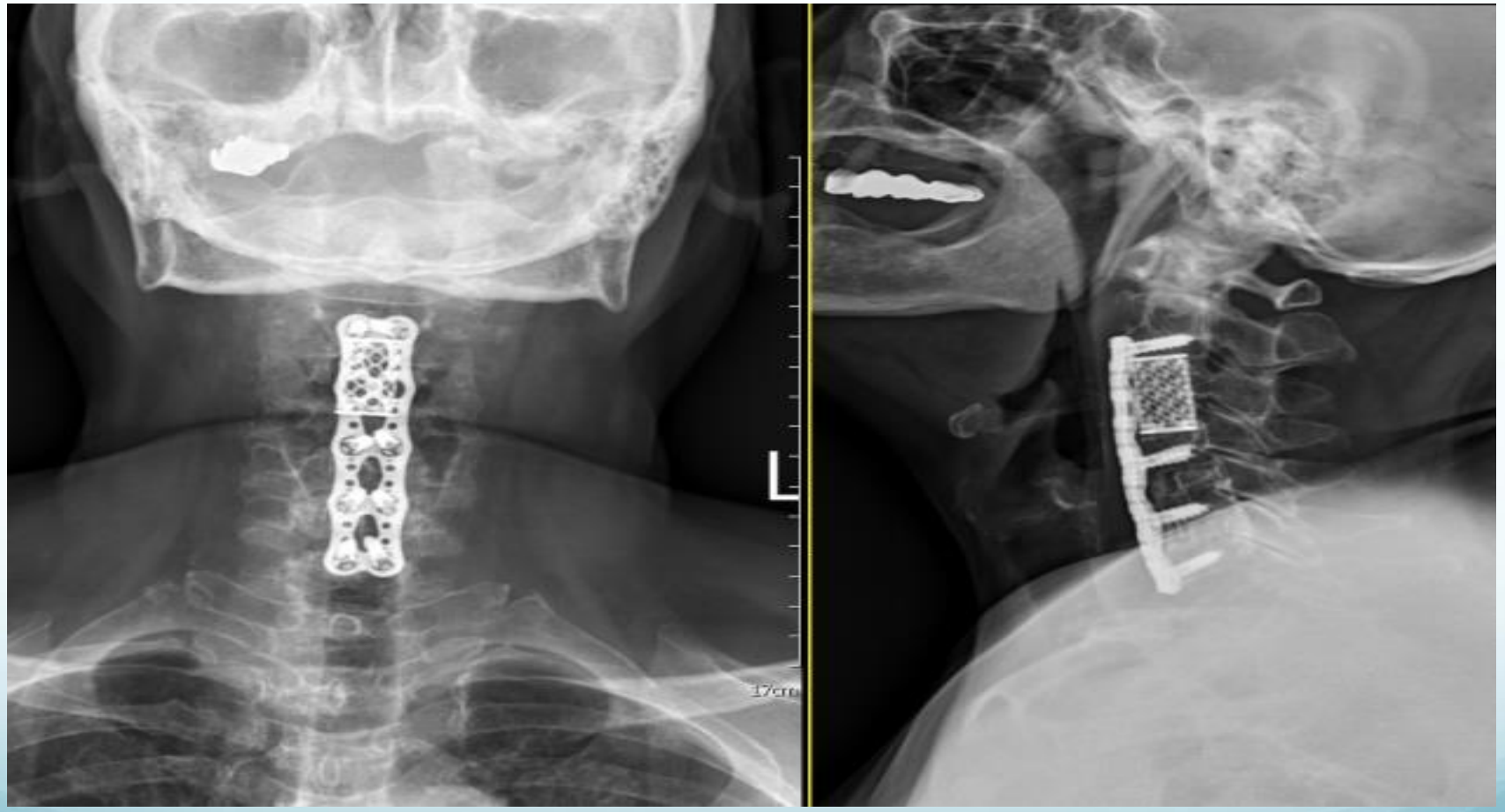
SK plate cages fusion fixation (C3-6)-2

Titanium Mesh Cervical Cage (Synmesh)

C3 Mesh cage replacement with plate fixation (C3 compression fracture with C3/4 EDH)-1



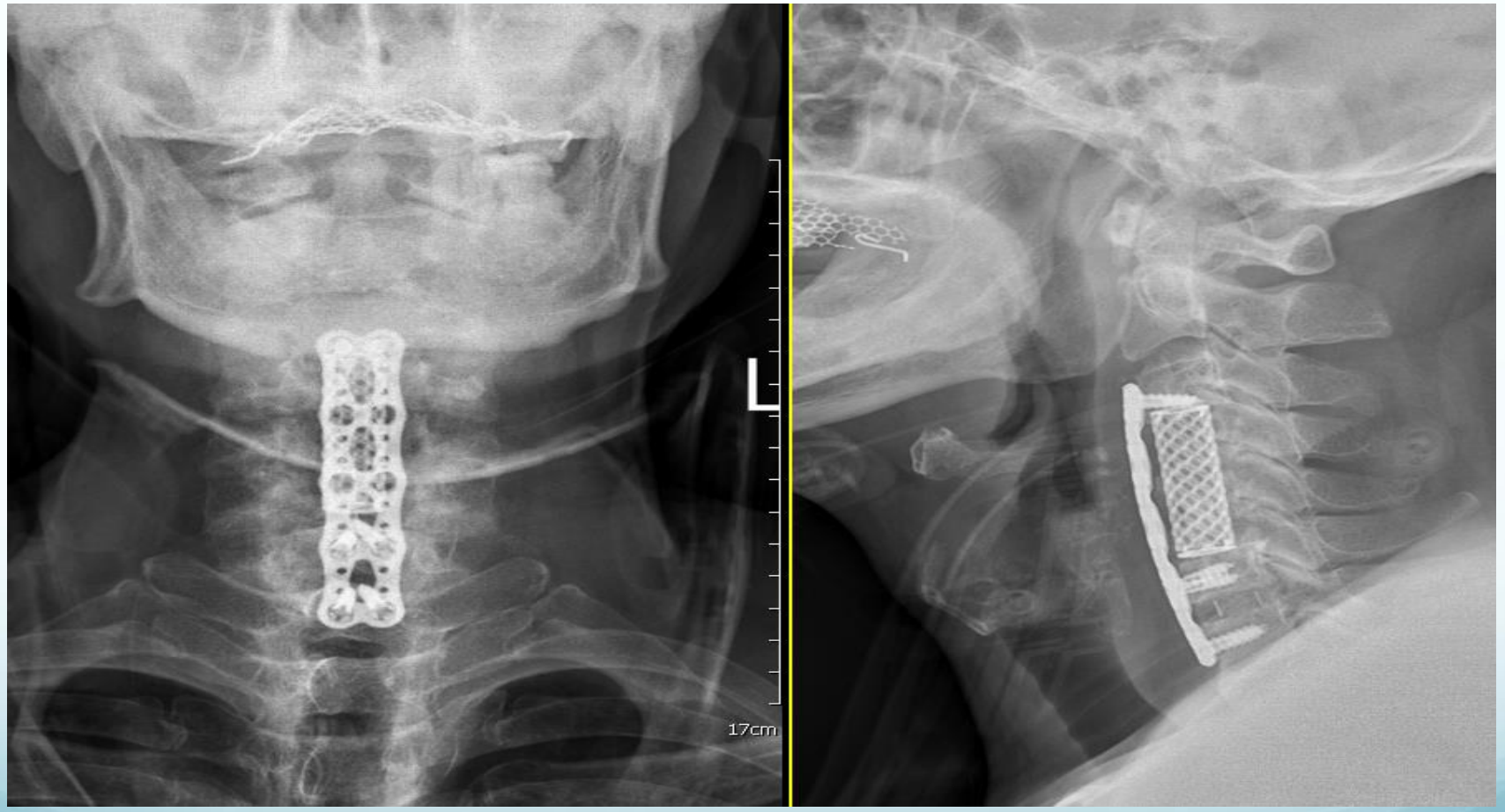
C3 Mesh cage replacement with plate fixation (C3 compression fracture with C3/4 EDH)-2



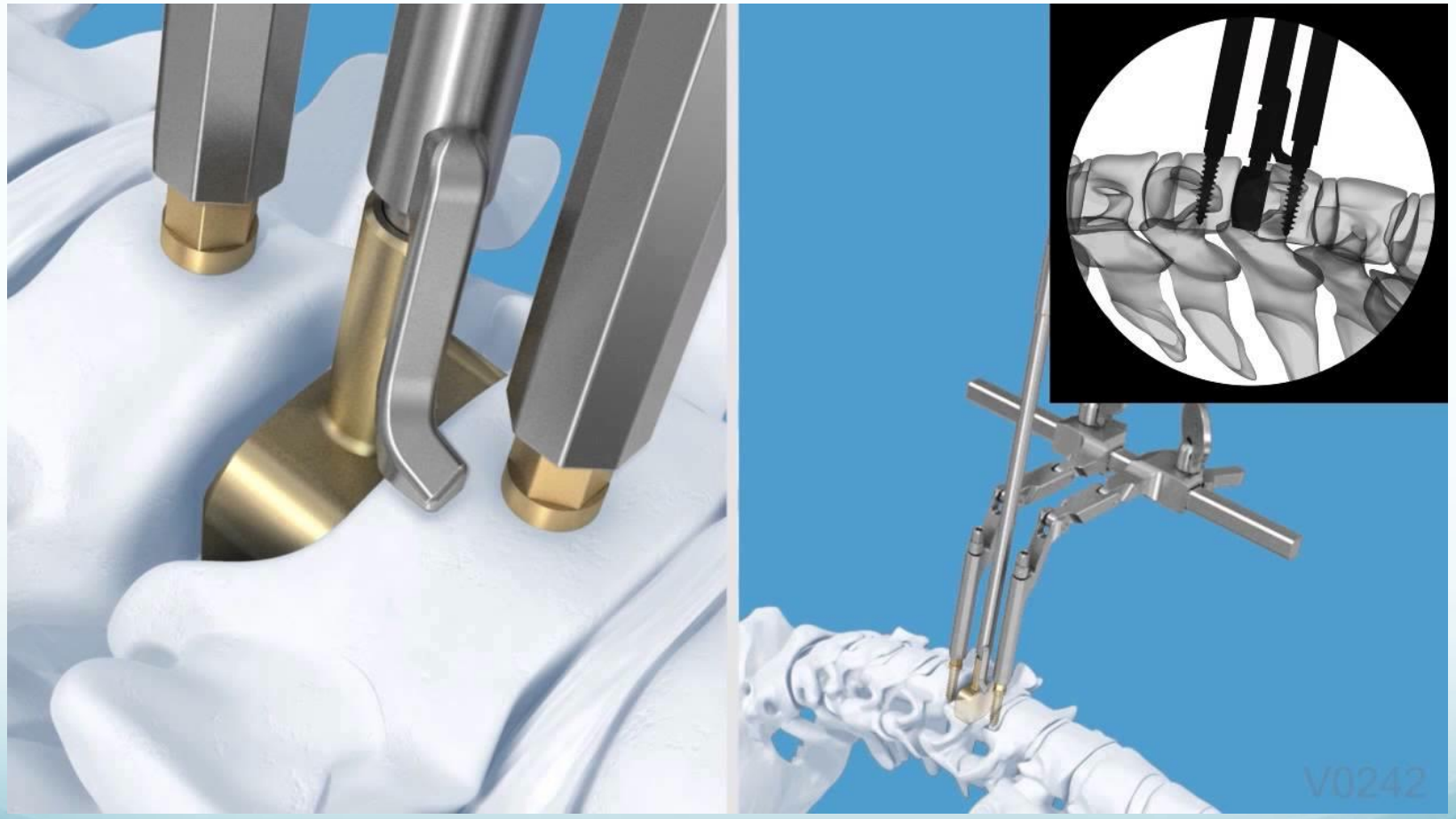
C4,5 Mesh cage replacement with plate fixation (C4/5/6 OPLL + C3-7 stenosis)-1

C4,5 Mesh cage replacement with plate fixation (C4/5/6 OPLL + C3-7 stenosis)-2

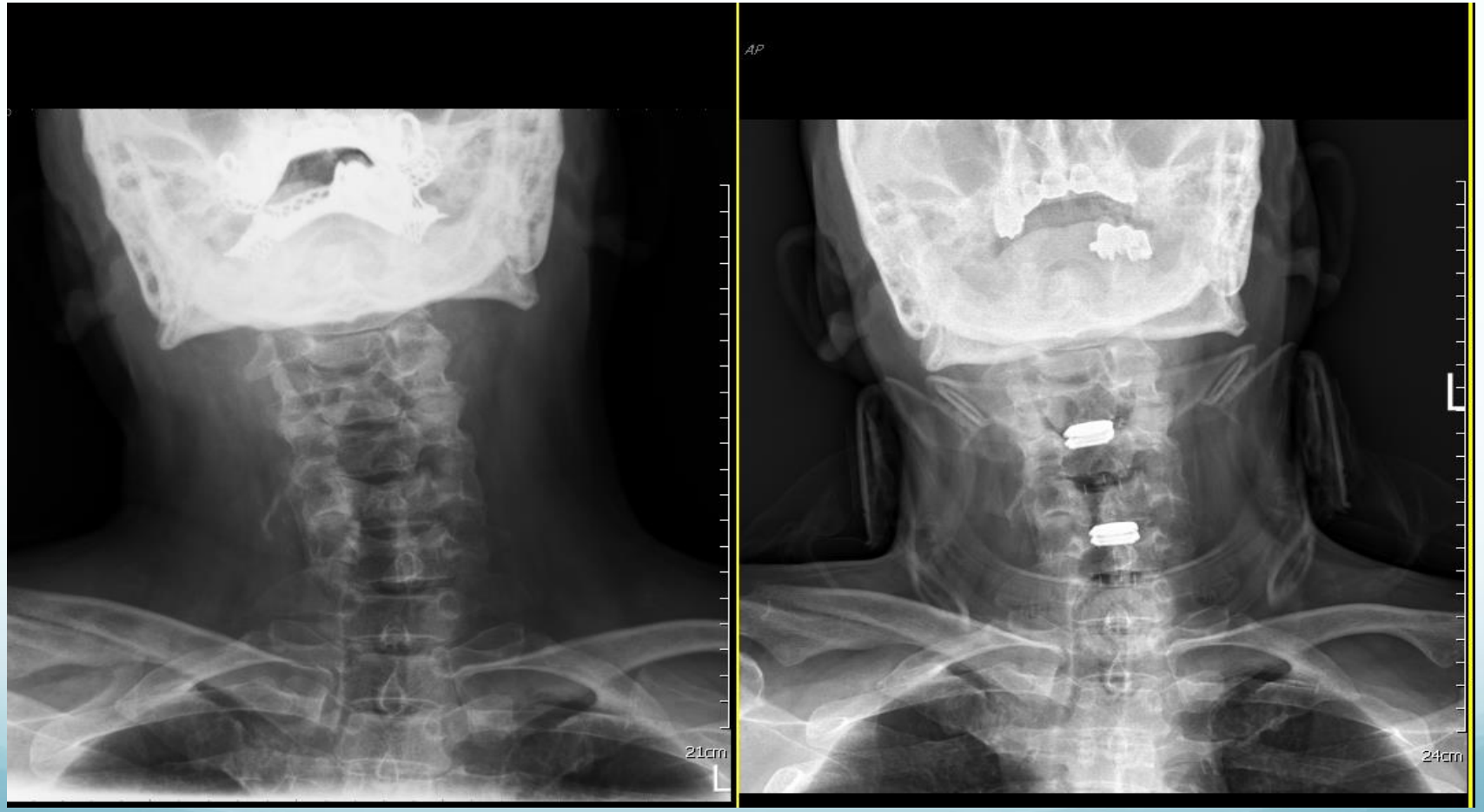
C4,5 Mesh cage replacement with plate fixation (C4/5/6 OPLL + C3-7 stenosis)-3



Total Disc Replacement (TDR)-Prodisc

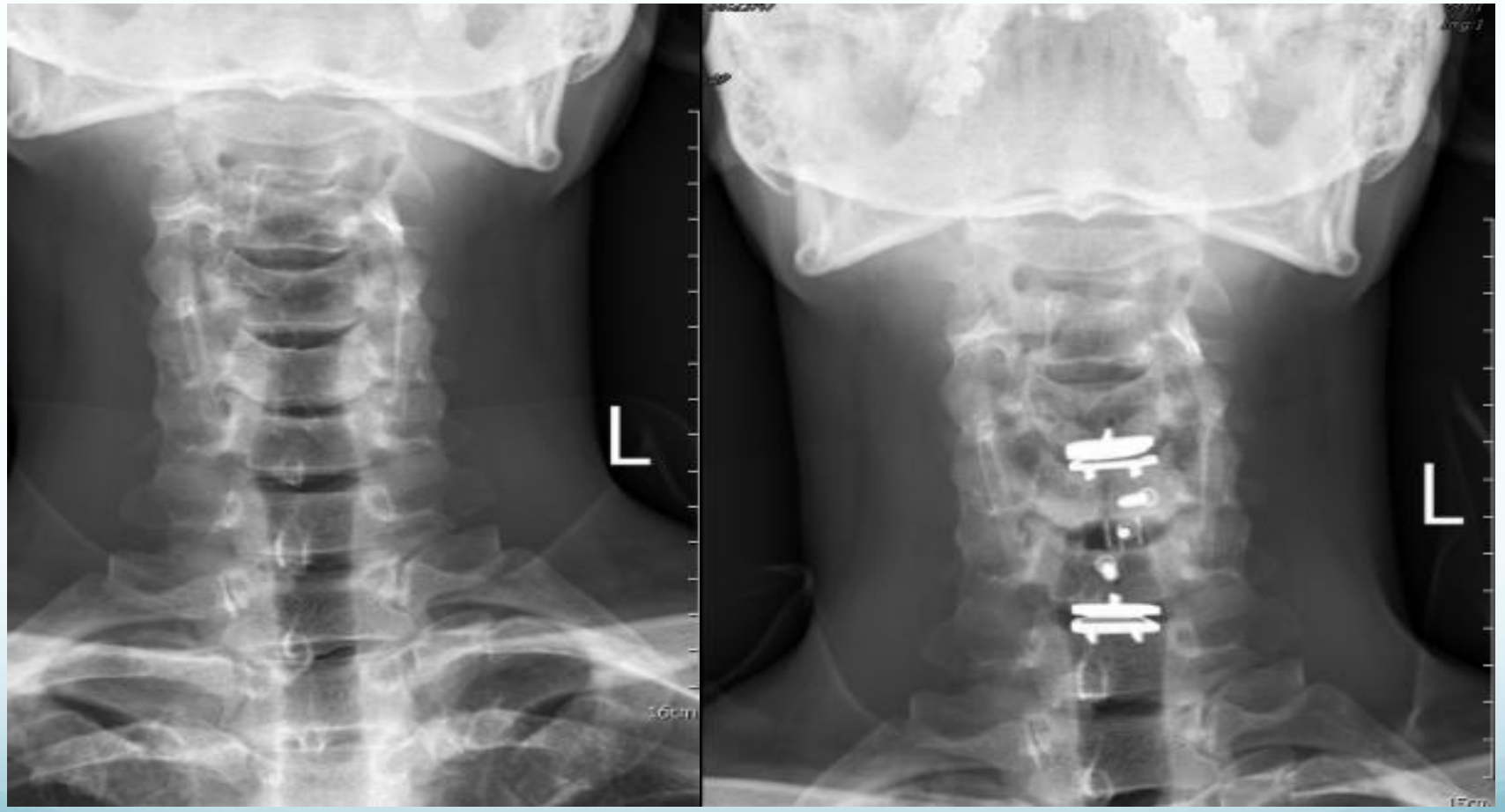

V0242

Hybrid: C3/4 & 5/6 TDR with C4/5 cage fusion-1



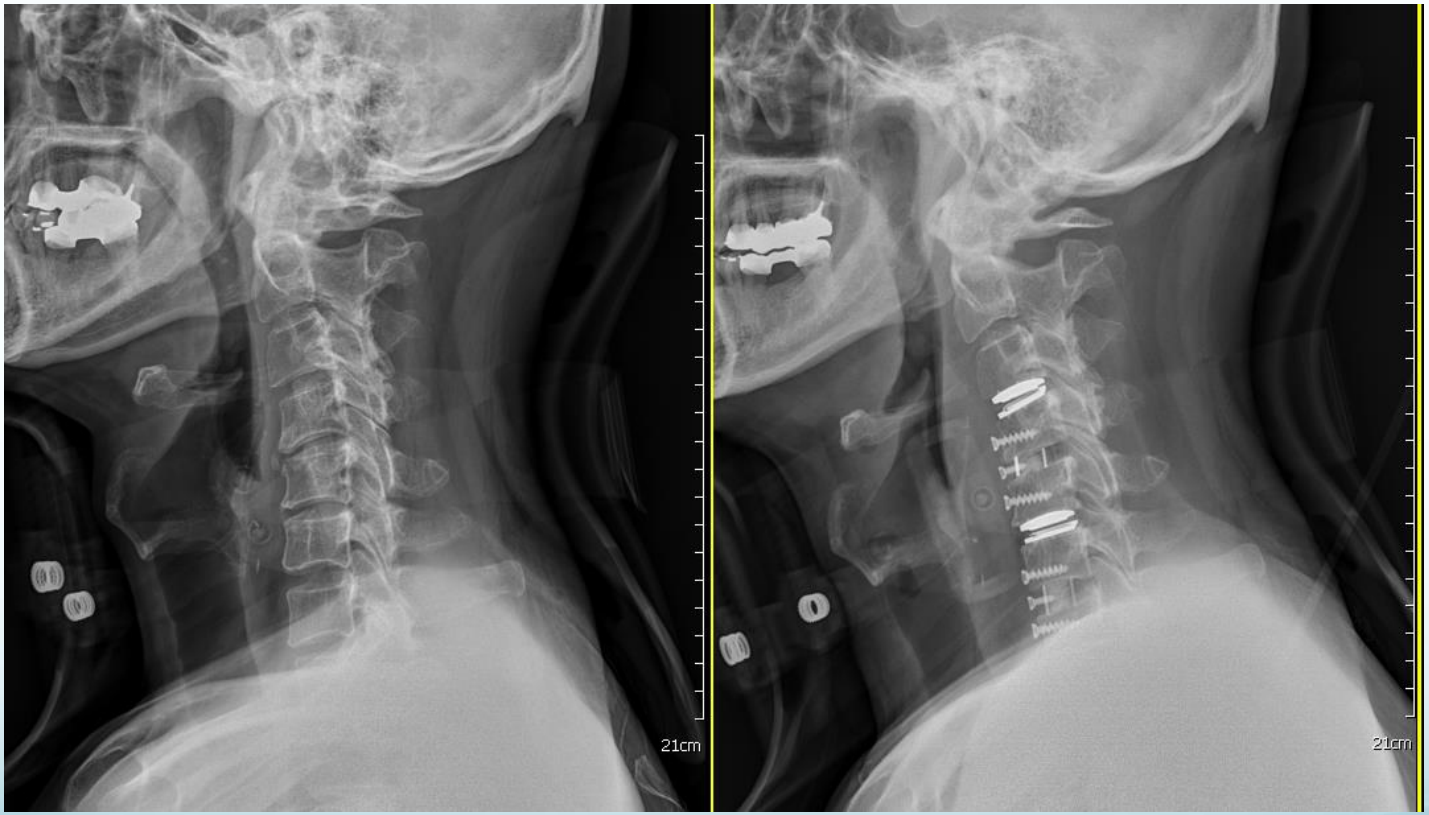
Hybrid: C3/4 & 5/6 TDR with C4/5 cage fusion-2

Hybrid: C4/5 & 6/7 TDR
C5/6 SK plate cage fusion-1

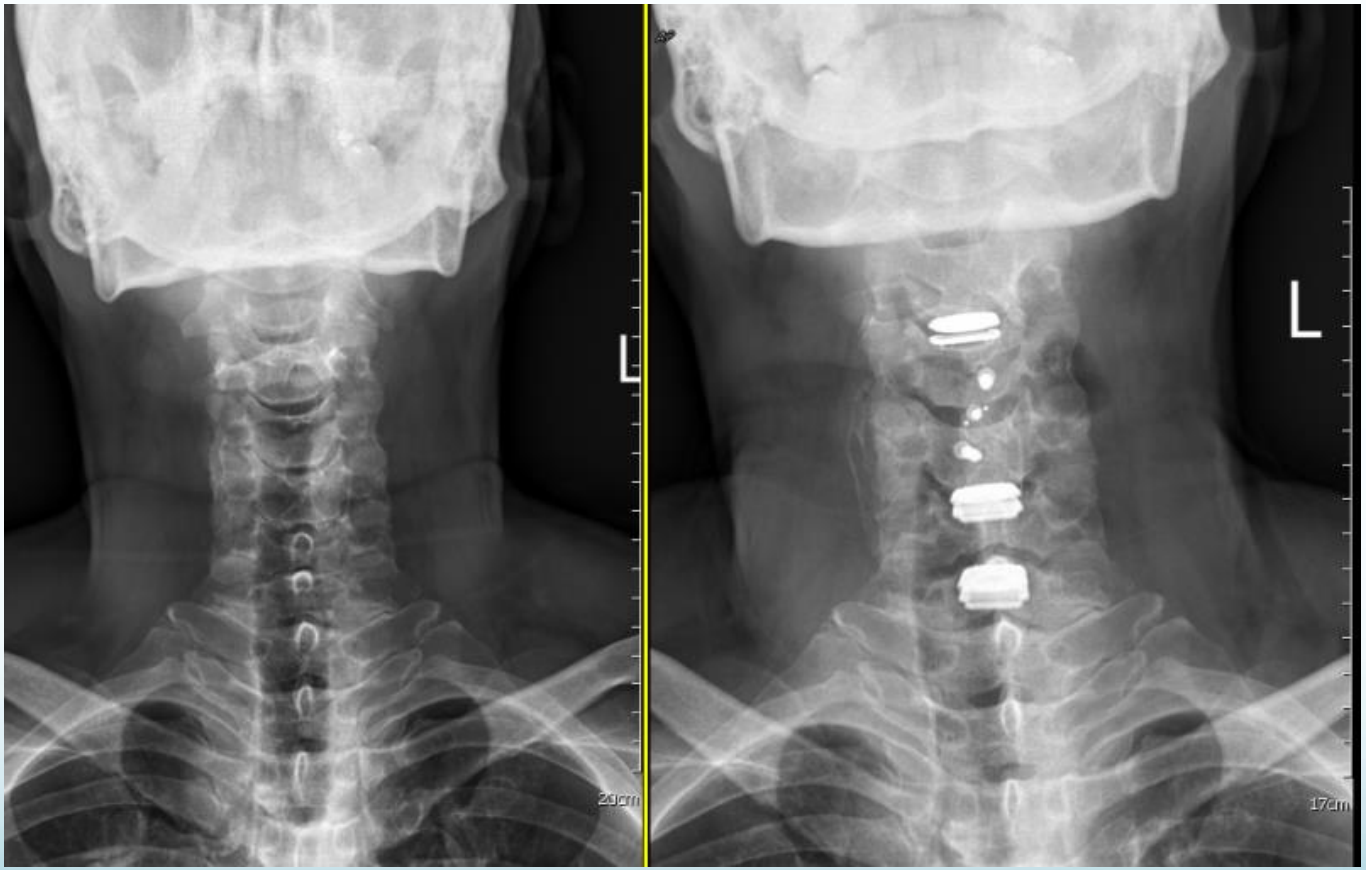


Hybrid: C4/5 & 6/7 TDR
C5/6 SK plate cage fusion-2

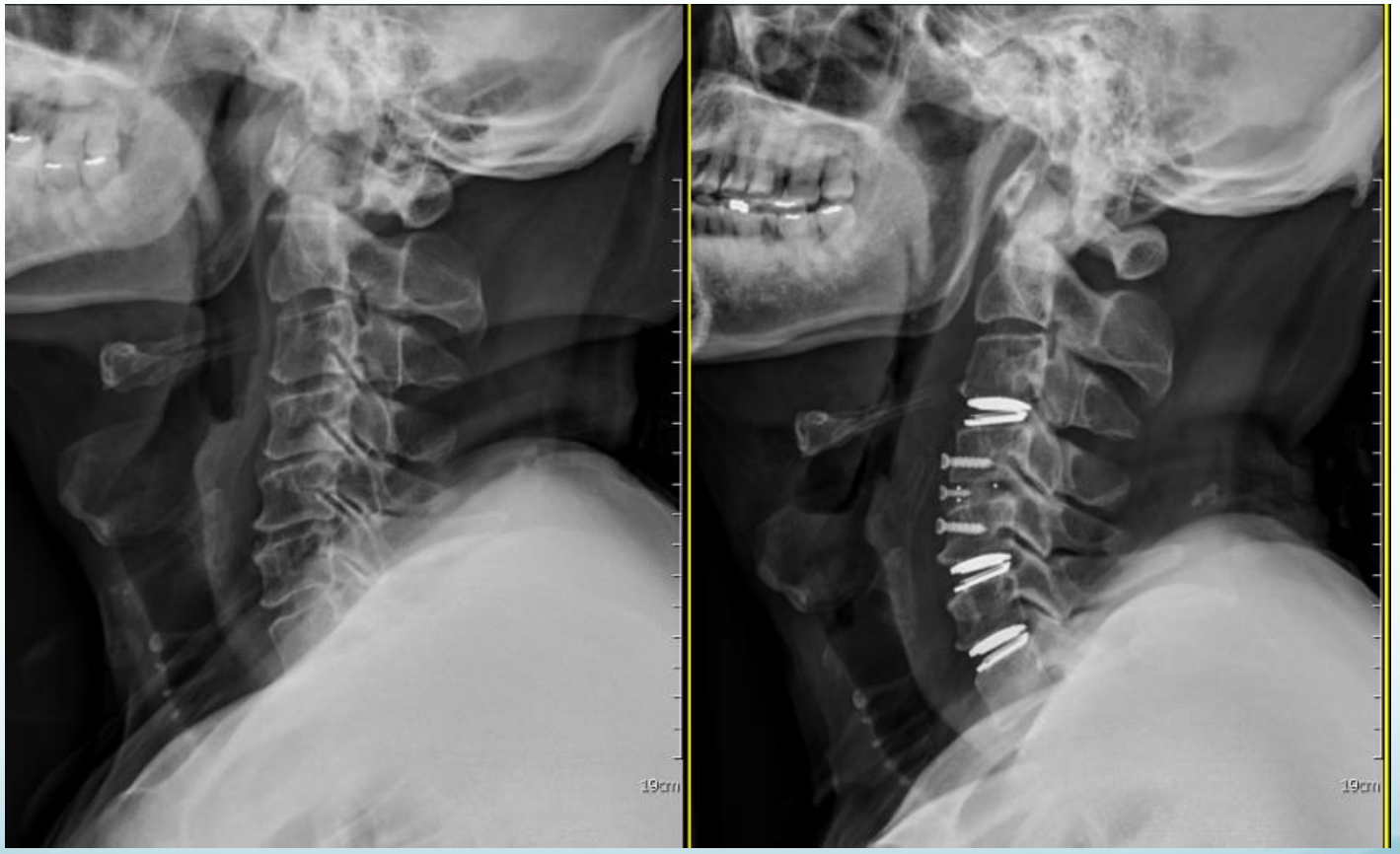
Hybrid: C3/4 & 5/6 TDR with C4/5 & 6/7 SK plate and cage fusion



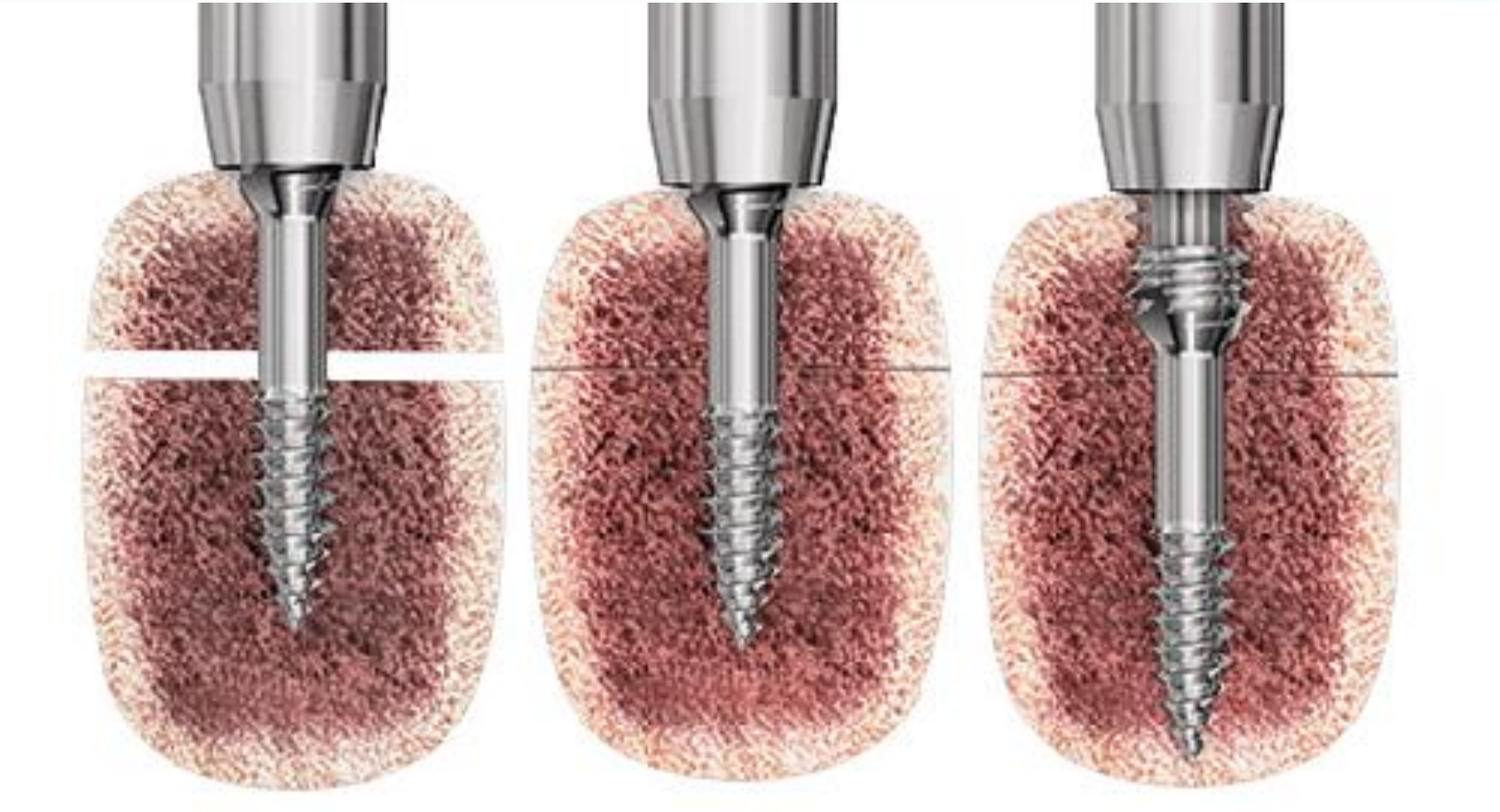
Hybrid: C3/4 & 5/6/7 TDR with C4/5 SK plate and cage fusion-1

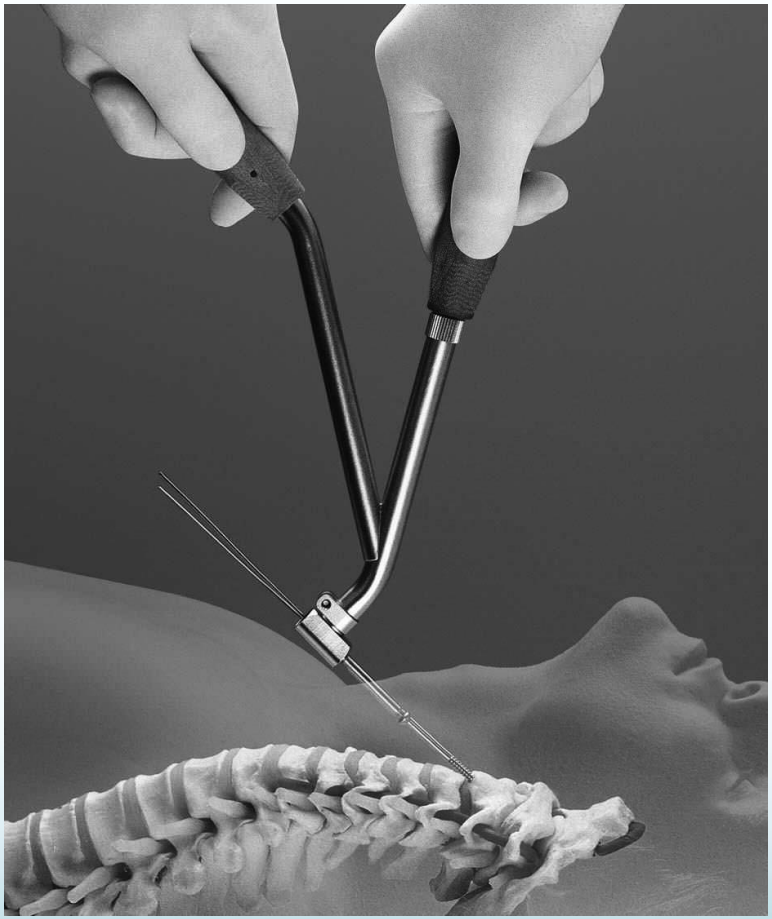


Hybrid: C3/4 & 5/6/7 TDR with C4/5 SK plate and cage fusion-2



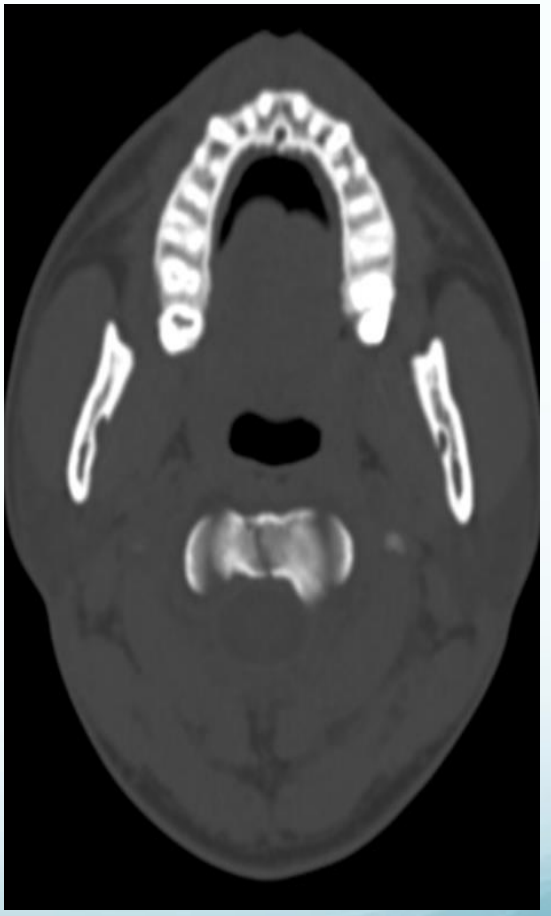
C1 Lag (Compression) Screw



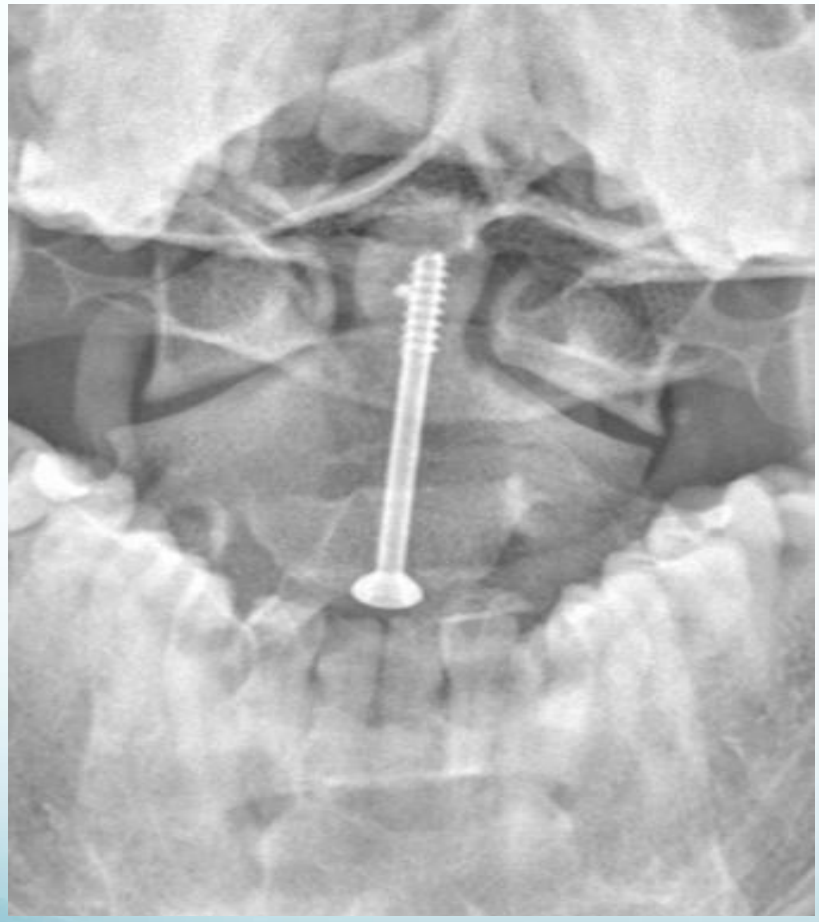


C1 lag screw (C2 fracture)-1

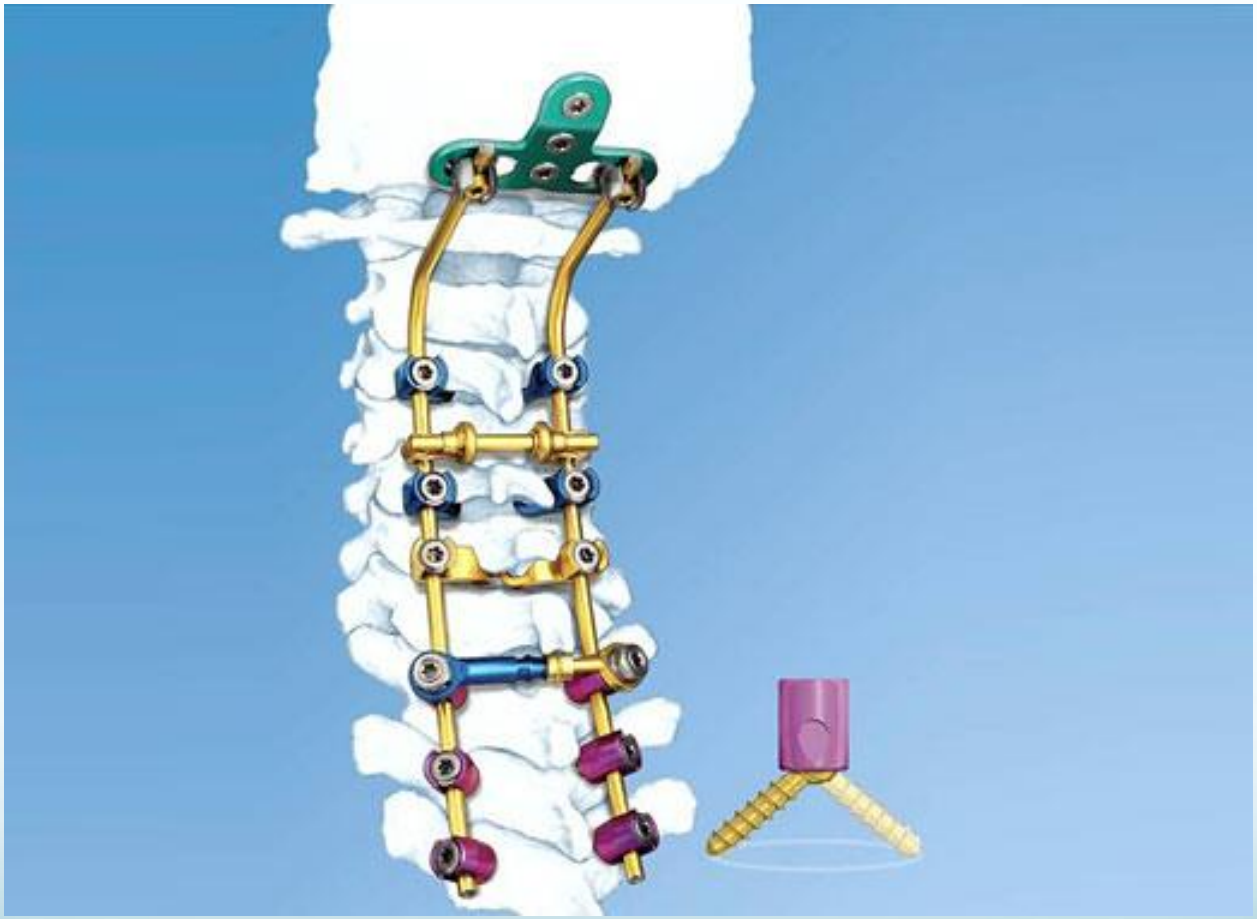
C1 lag screw (C2 fracture)-2



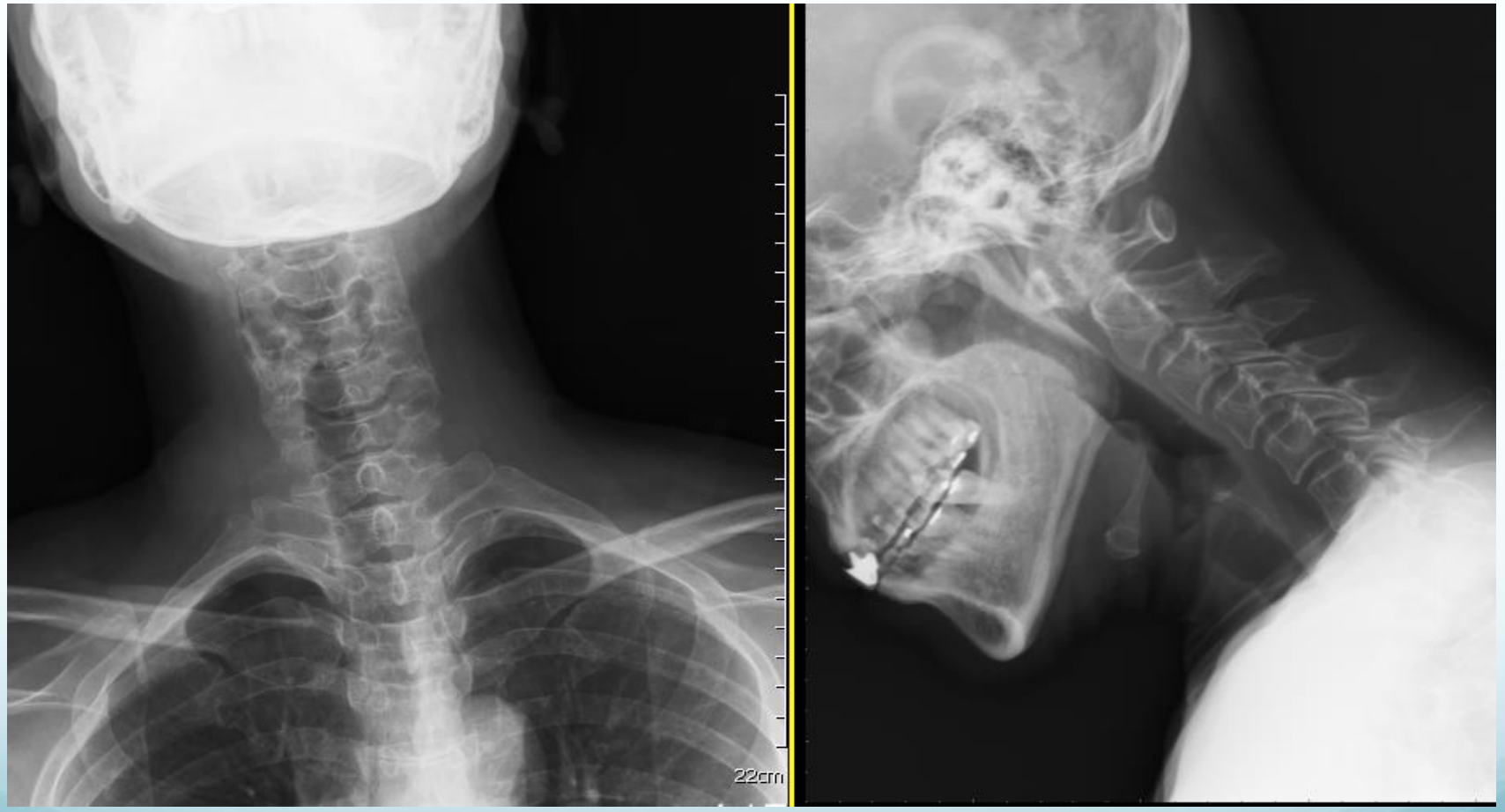
C1 lag screw (C2 fracture)-3



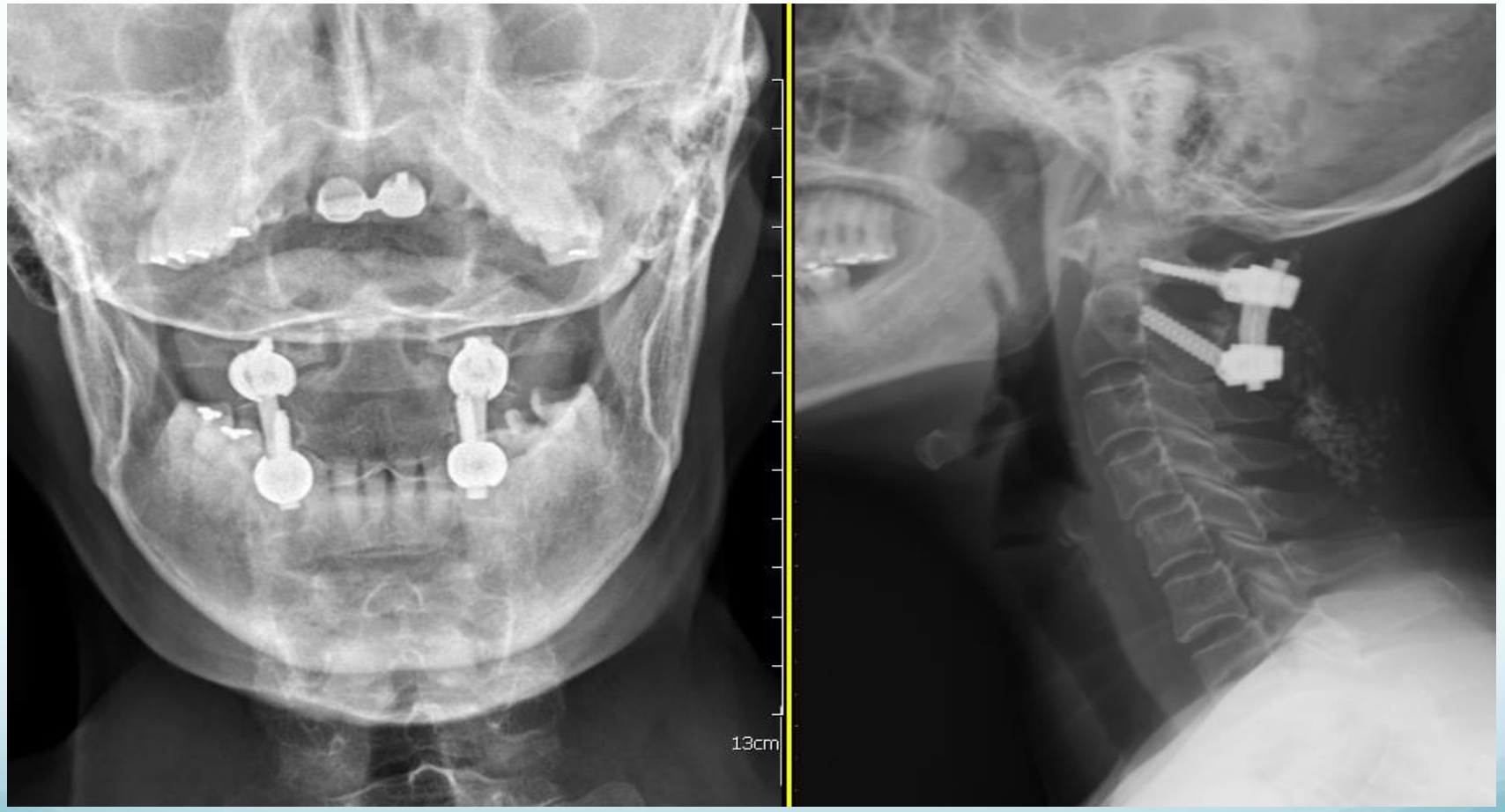
SYNAPSE System



C1-2 lateral mass screws fixation (C1-2 Subluxation)-1



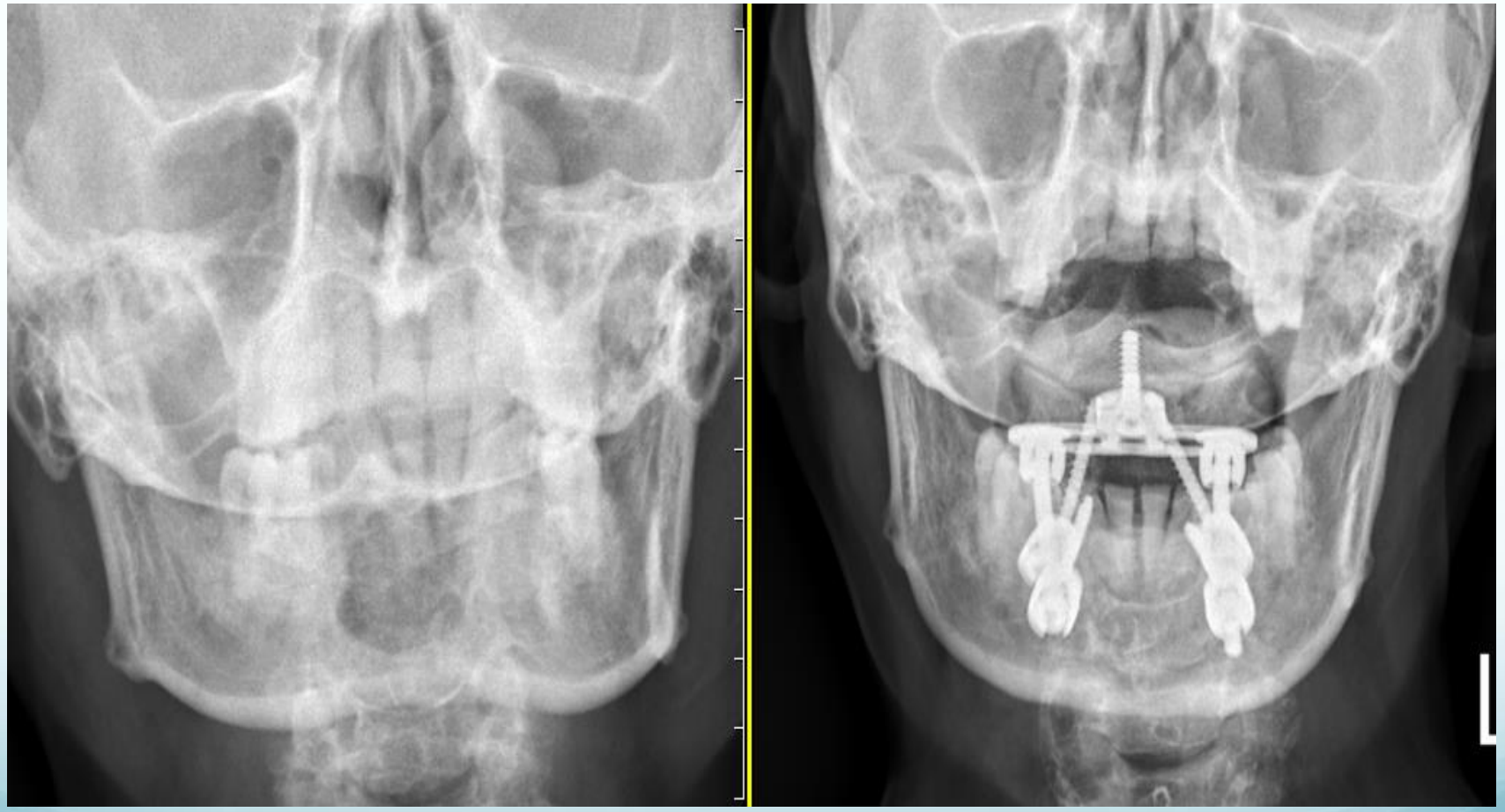
C1-2 lateral mass screws fixation (C1-2 Subluxation)-2



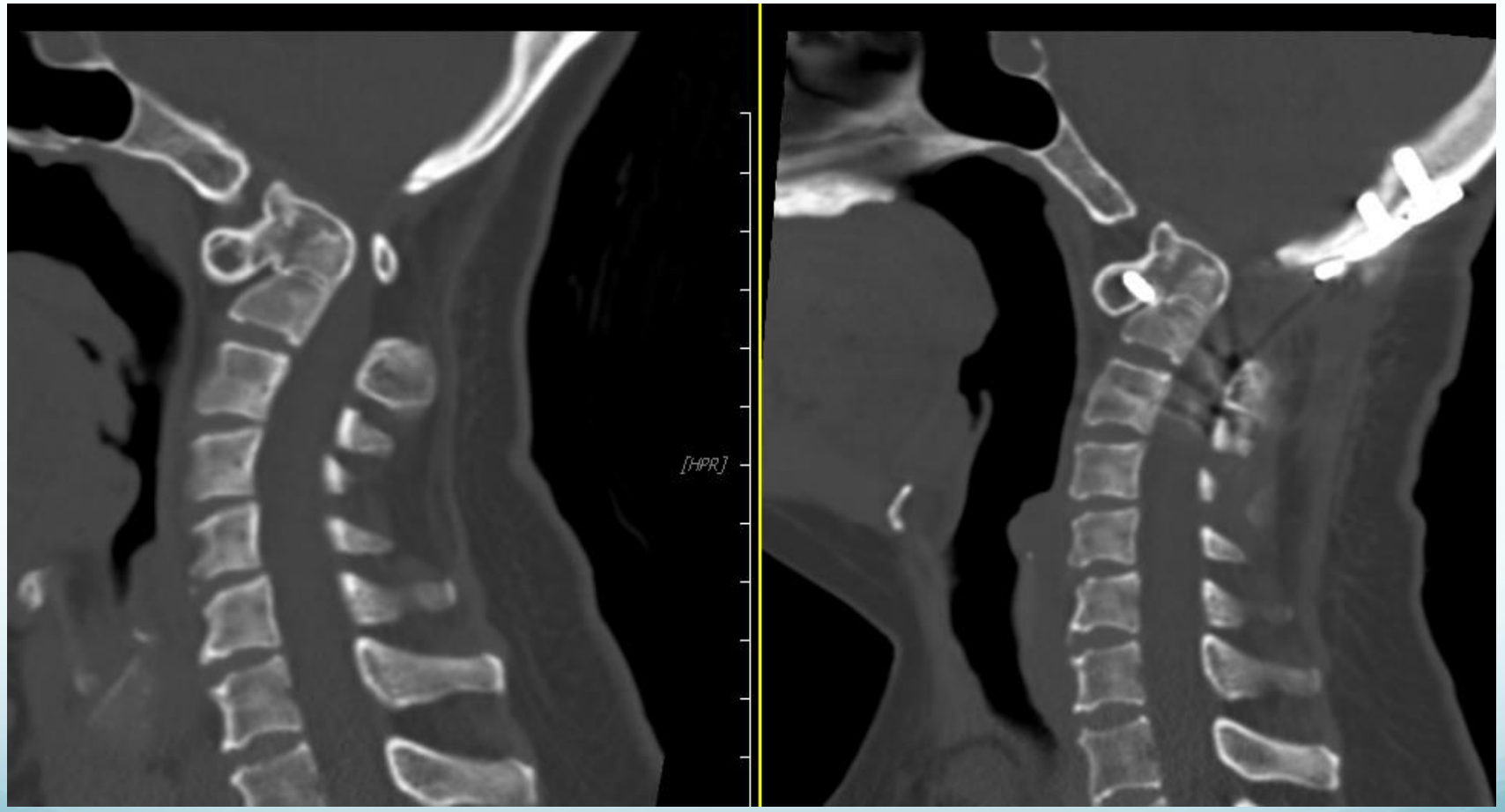
C1 lateral mass and C2 TPS fixation (C1-2 Subluxation)

Occiput-C2-3 TPS fixation (C1-2 dislocation)-1

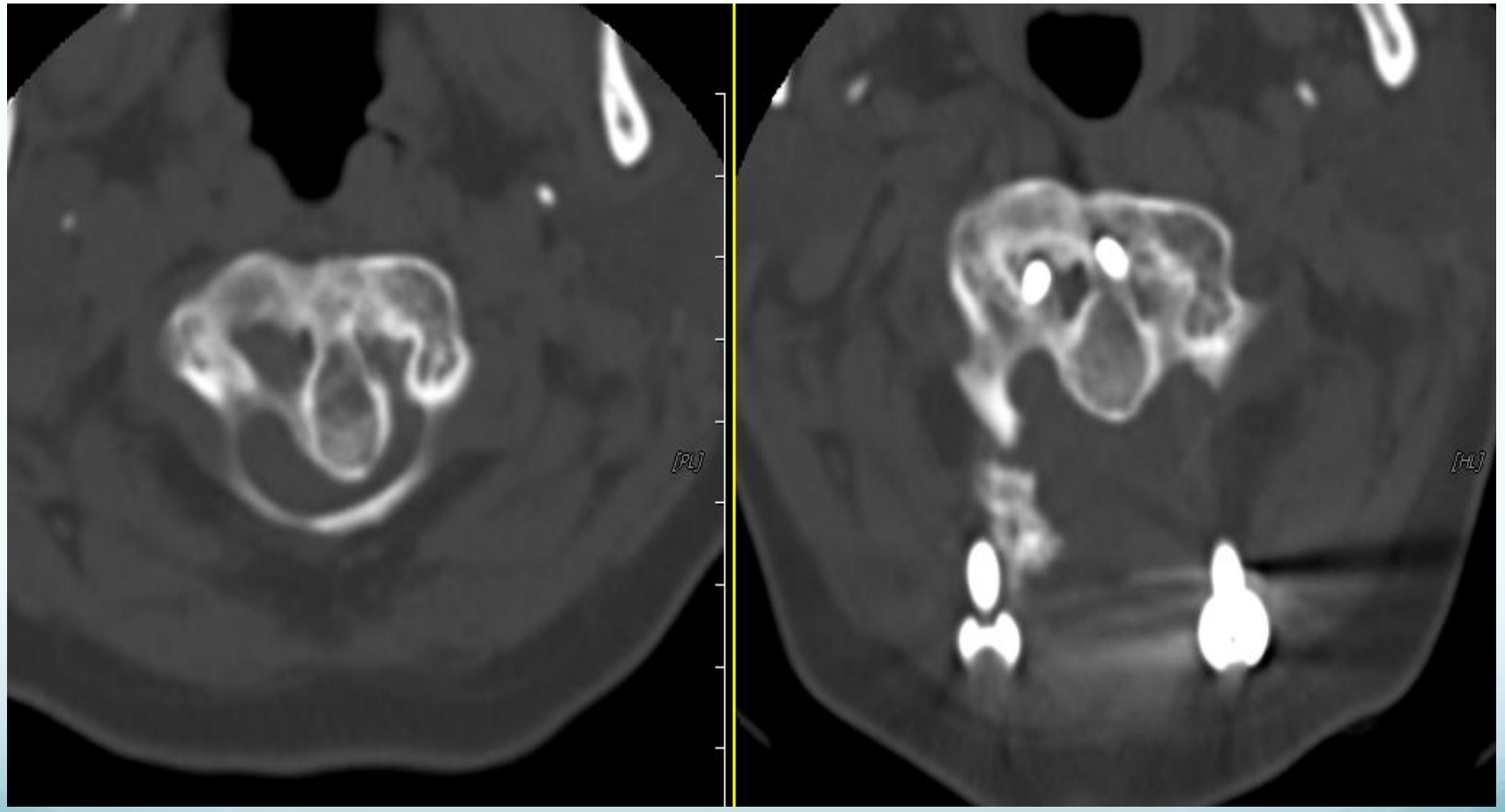
Occiput-C2-3 TPS fixation (C1-2 dislocation)-2



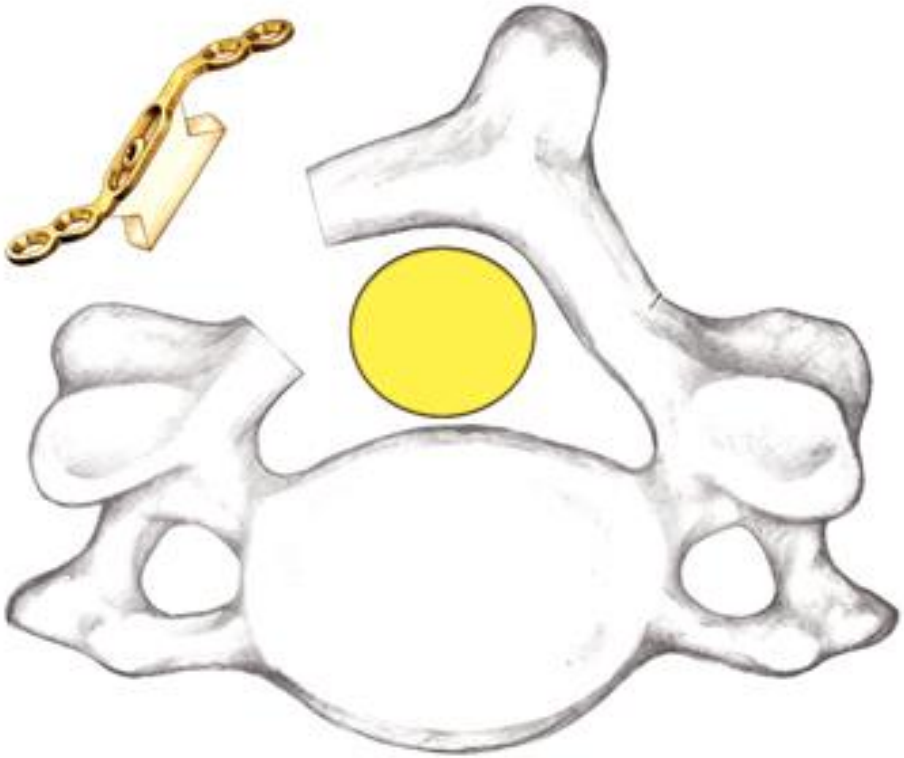
Occiput-C2-3 TPS fixation (C1-2 dislocation)-3



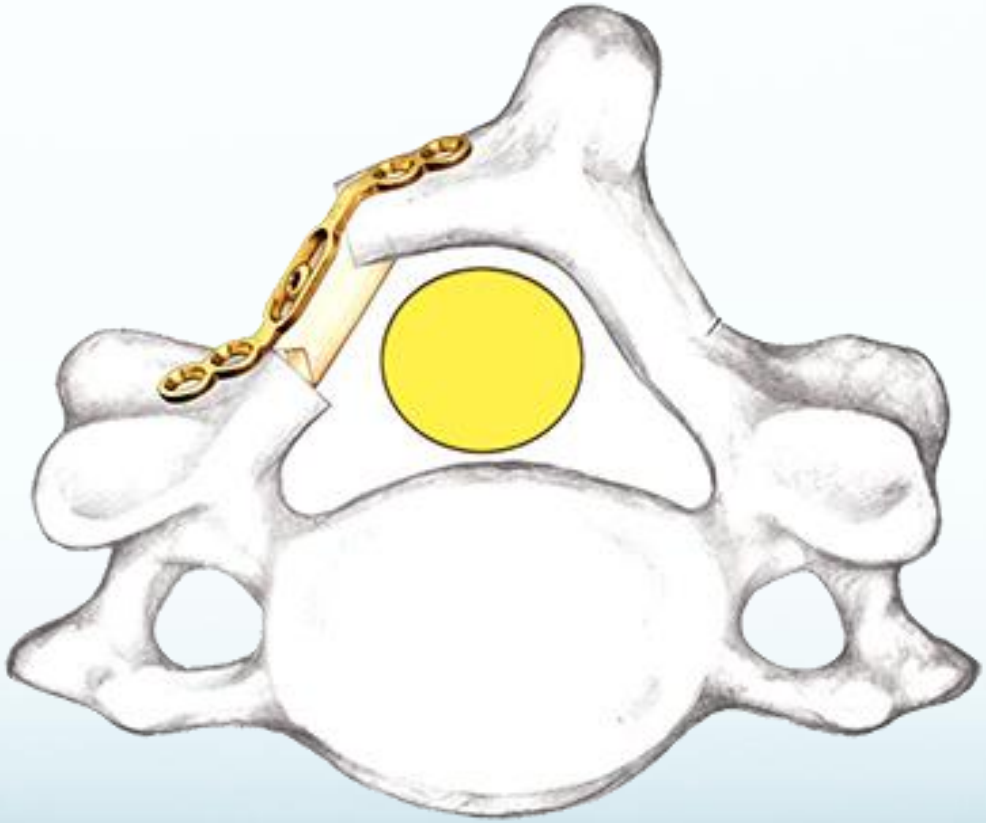
Occiput-C2-3 TPS fixation (C1-2 dislocation)-4



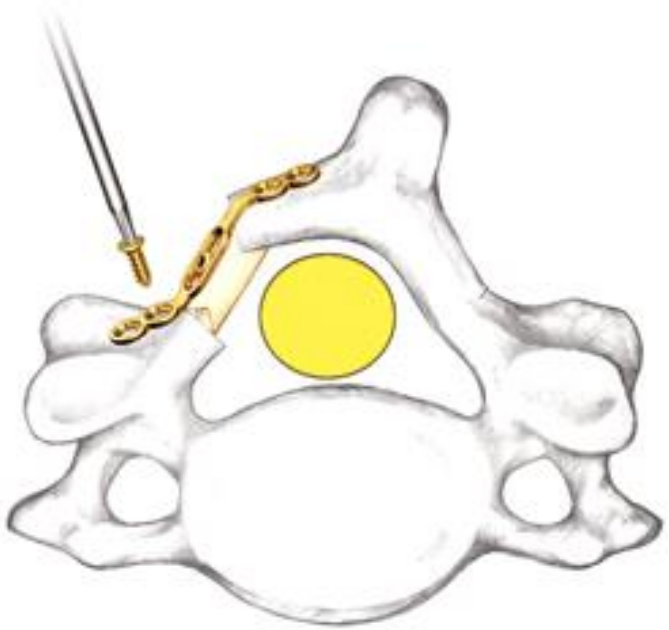
Open-door Laminoplasty-1



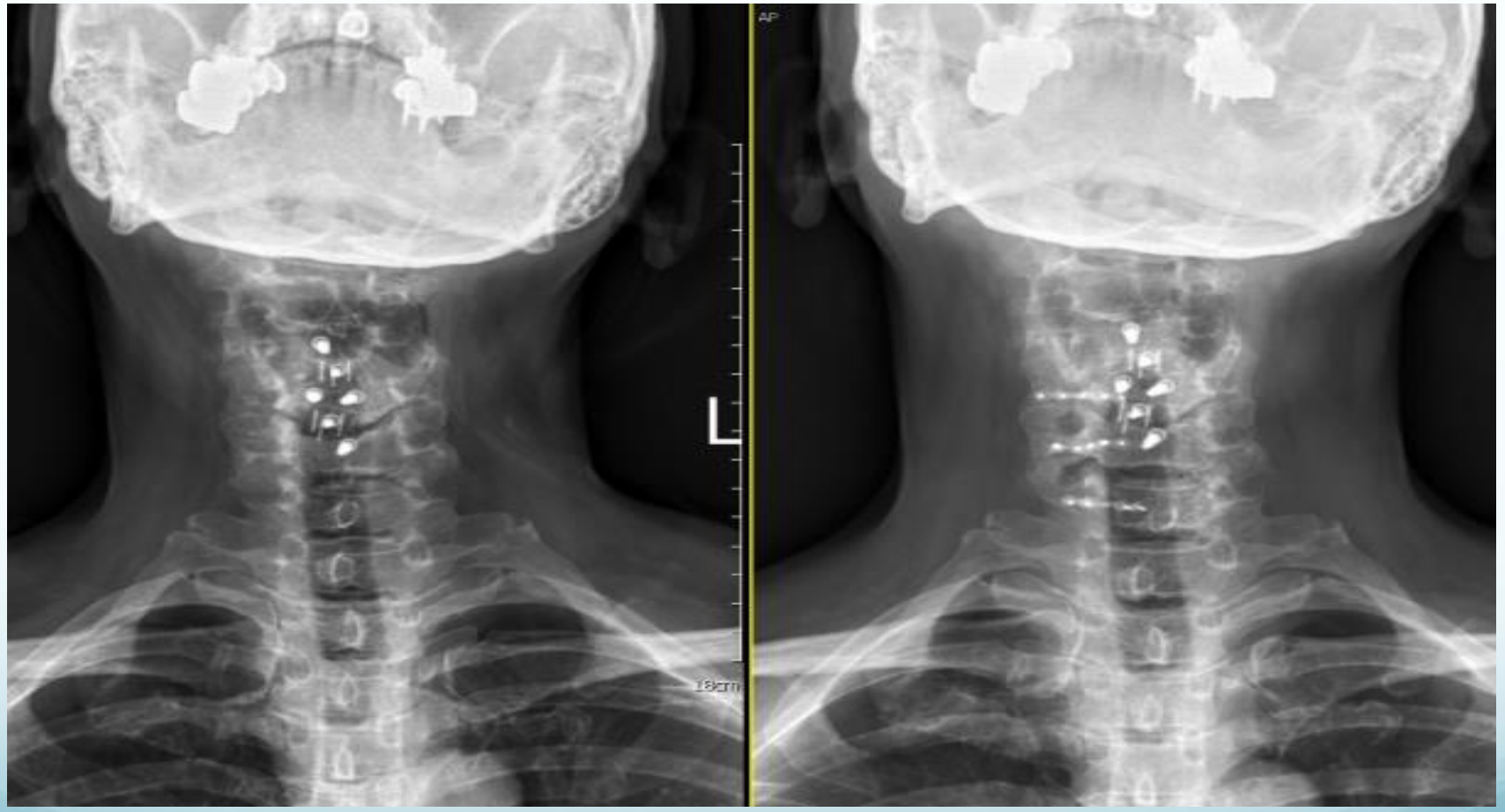
Open-door Laminoplasty-2



Open-door Laminoplasty-3

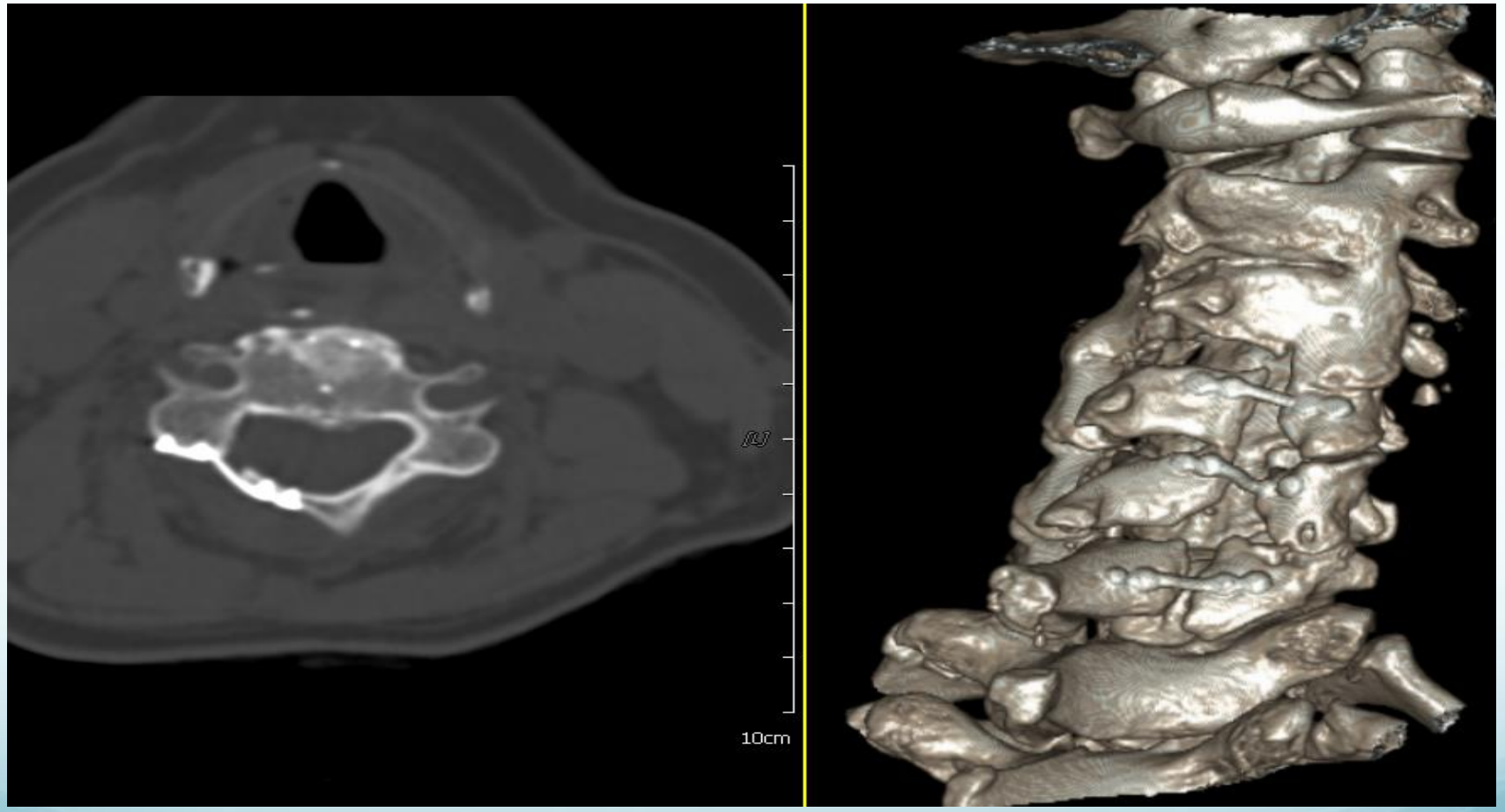


Open-door Laminoplasty (C4/5/6 stenosis)-1



Open-door Laminoplasty (C4/5/6 stenosis)-2

Open-door Laminoplasty (C4/5/6 stenosis)-3

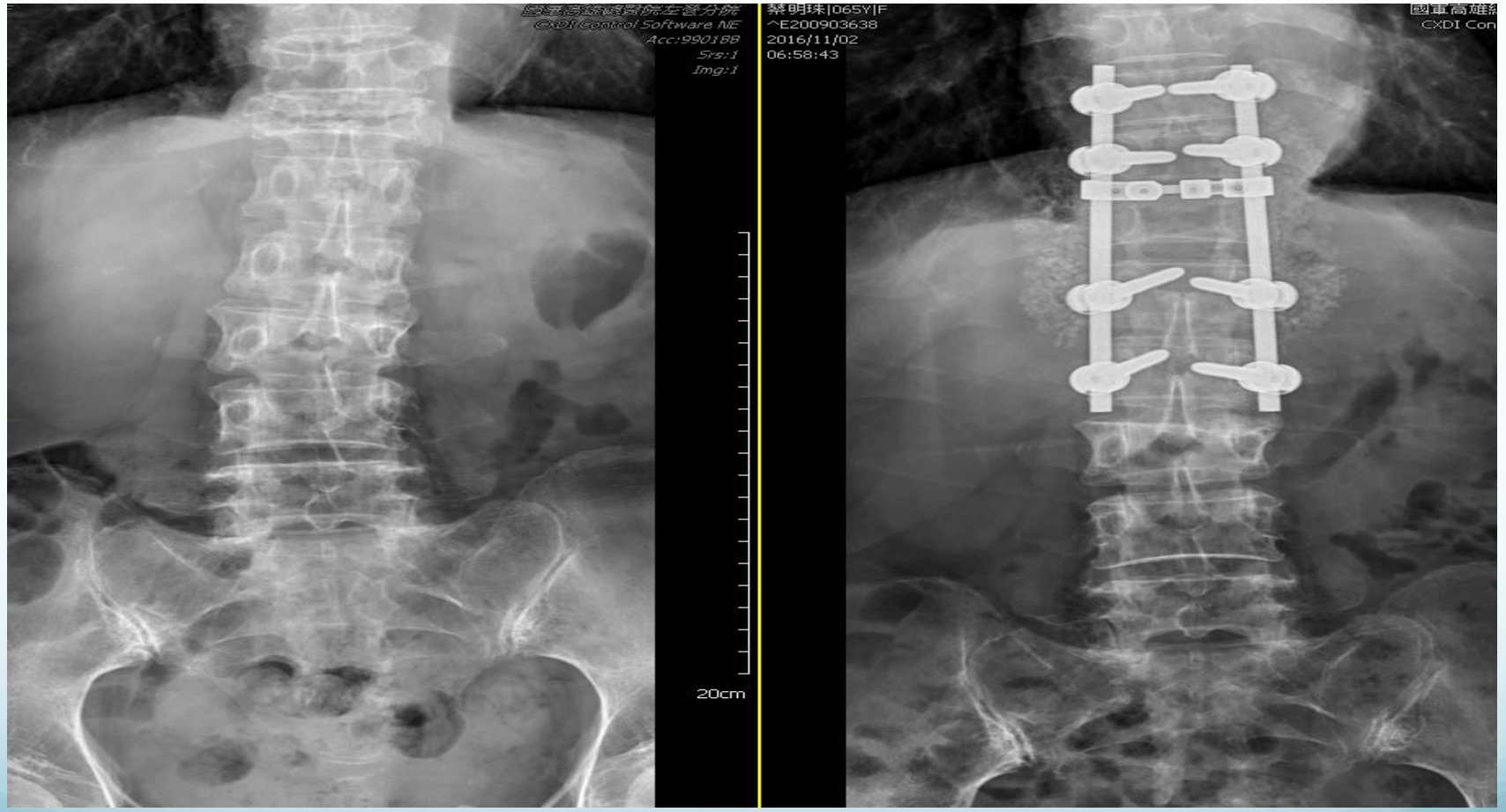


Lumbar Transpedicular Screw (TPS) Fixation

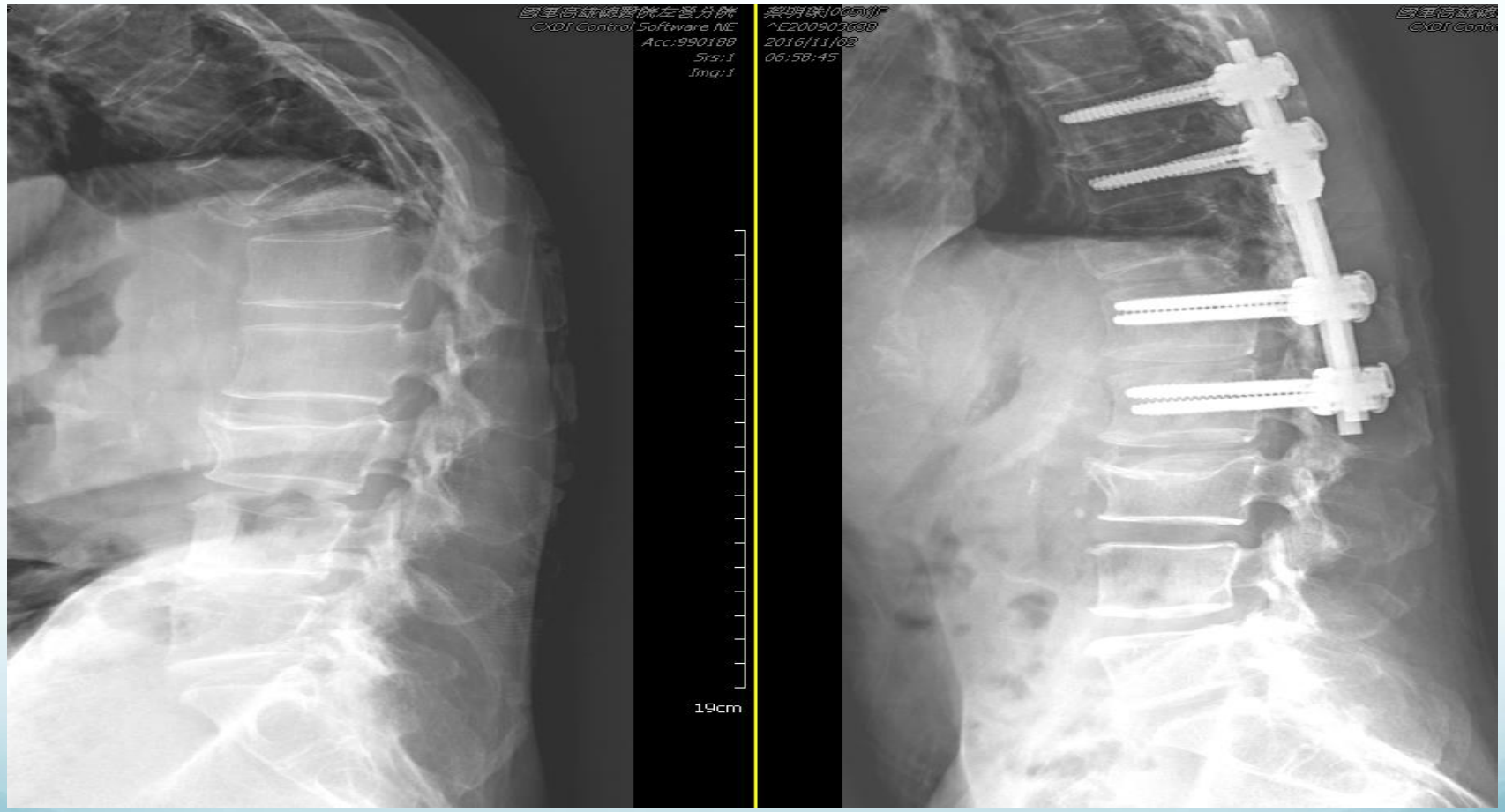
Lumbar Transpedicular Screw (TPS) Fixation

- https://www.youtube.com/watch?v=rU8YYESYXzc

TPS fixation with PL fusion (T12 bursting fracture)-1

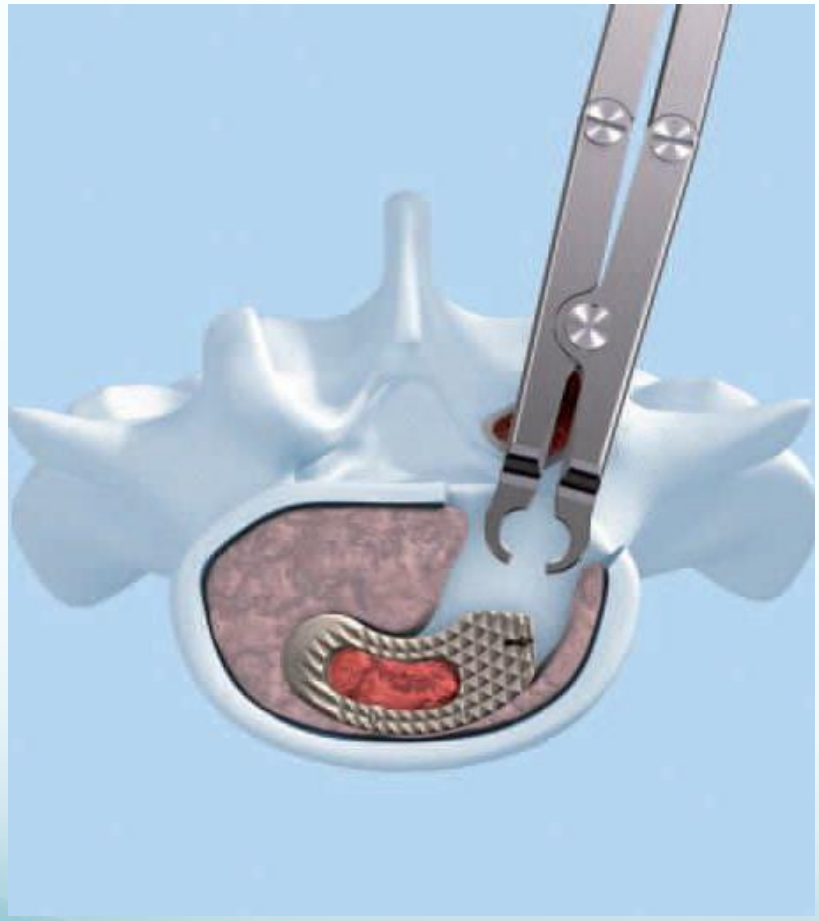


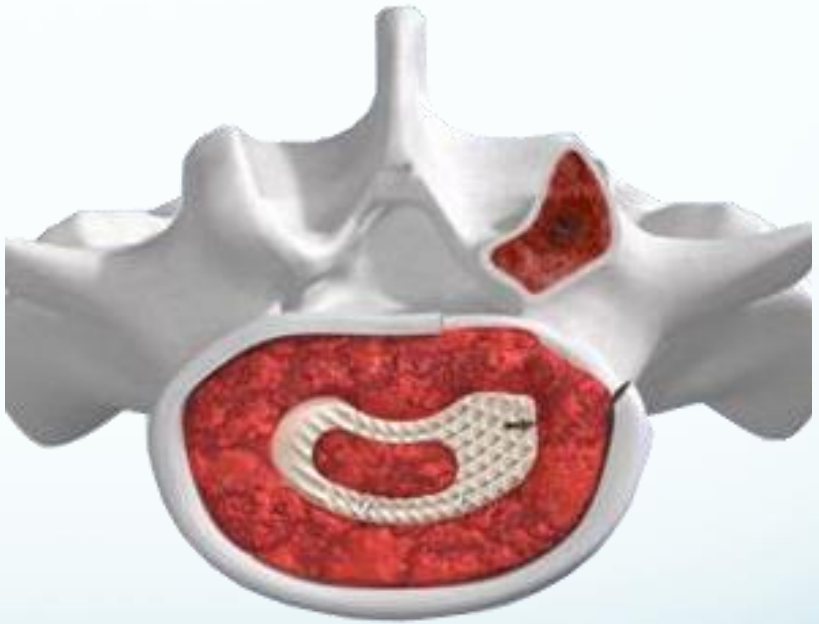
TPS fixation with PL fusion (T12 bursting fracture)-2

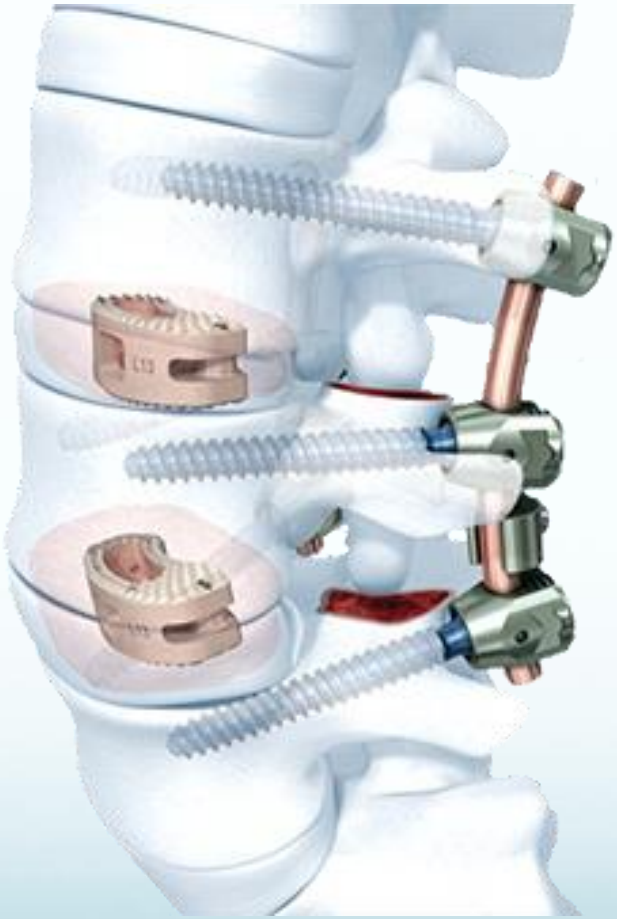


Lumbar Interbody Cage Fusion

Lumbar Interbody Cage Fusion-Transforaminal (TLIF)



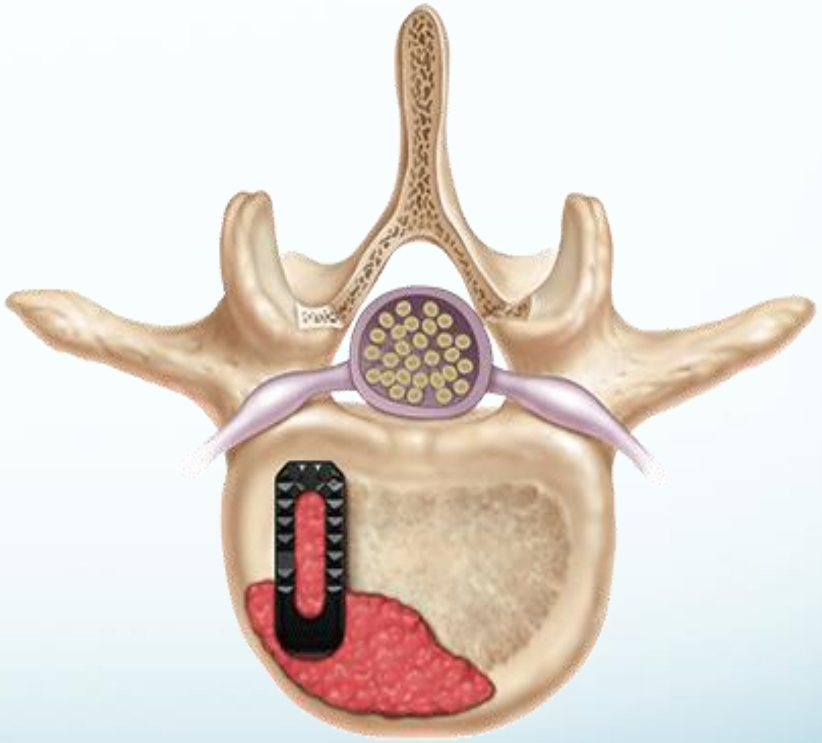




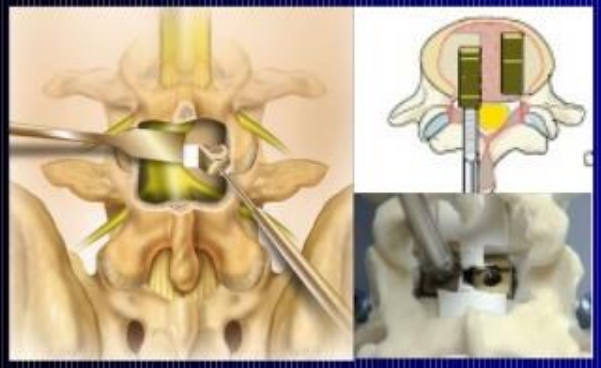
TPS TLIF (L3/4/5S1)-1

TPS TLIF (L3/4/5S1)-2

Lumbar Interbody Cage Fusion-Posterior (PLIF)



PLIF technique



Bone graft & interbody cage

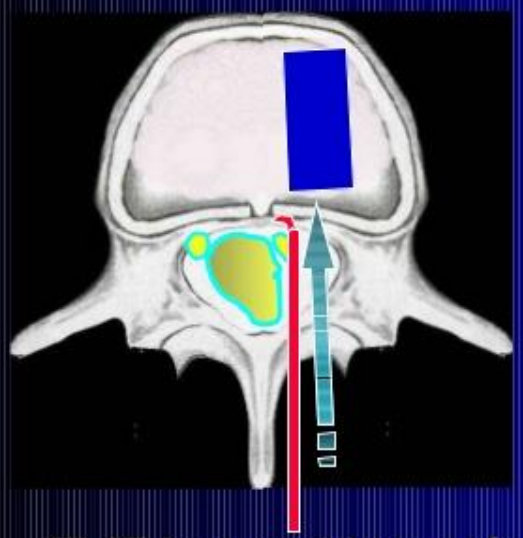
1. Vertebral spreader is used to widen the disk space.
2. Do not retract dural beyond midline of the spine.
3. Two cage is better results?.

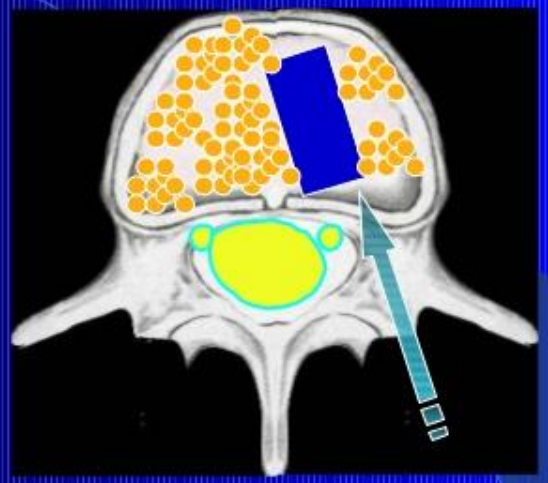
PEEK (Synthes)

Carbon (Depuy)

Titanium (Medtronic)

PLIF vs TLIF

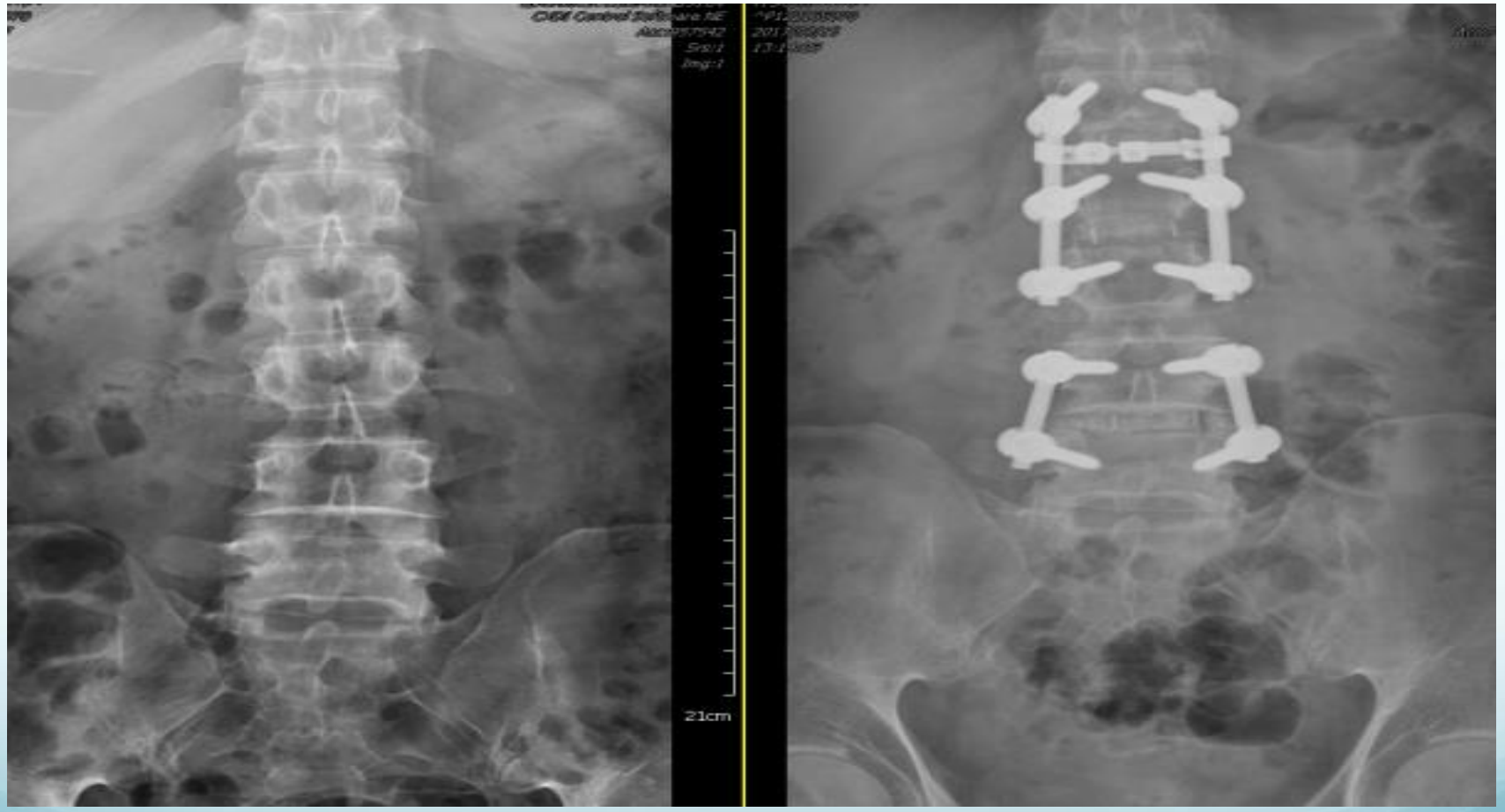




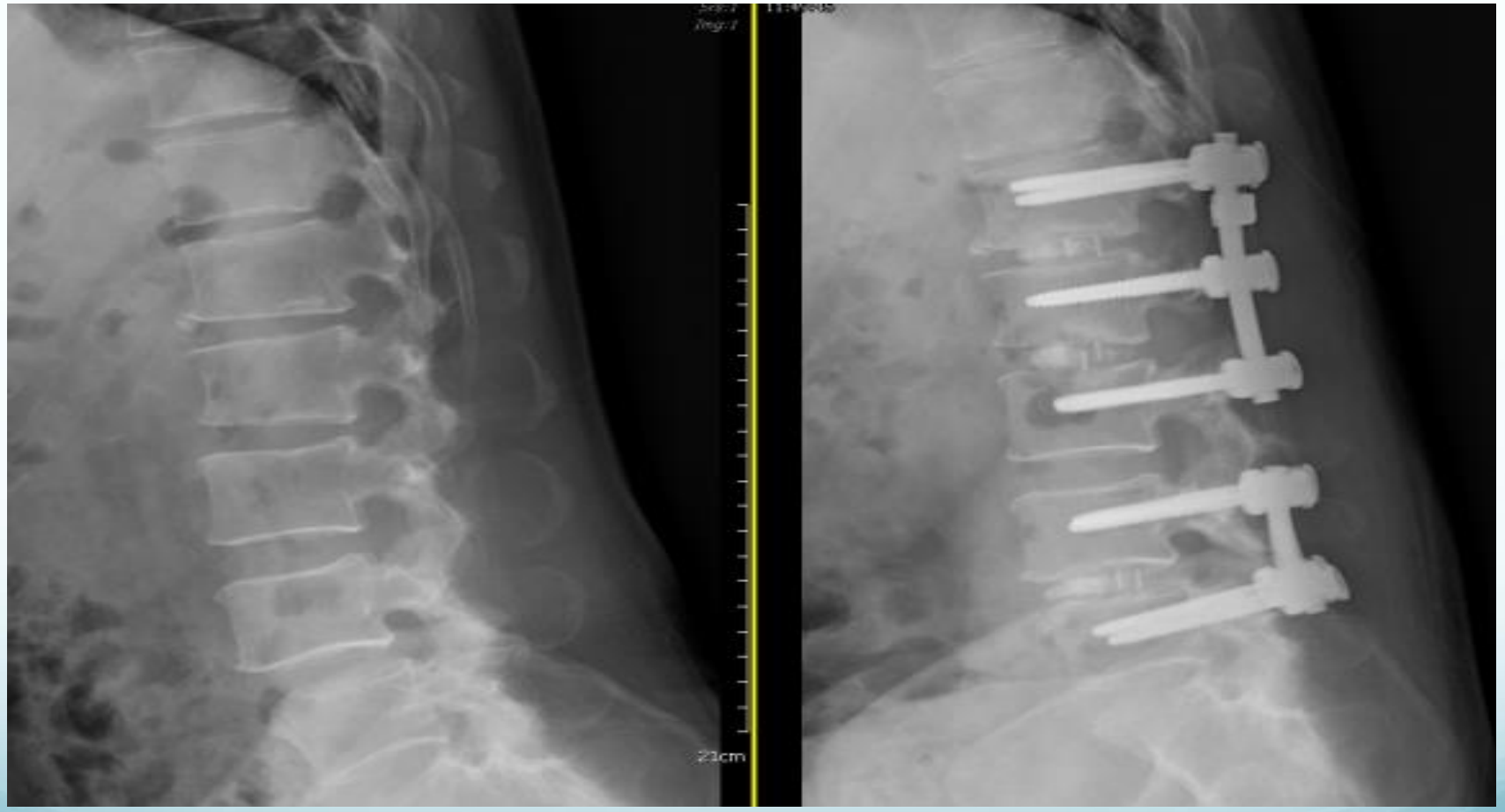
PLIF has problems of distracting neural tissue

1. Nerve root or cauda equina injury 19% (Turner 1994)
2. Dural tear 10% (Ray 1997)

TPS TLIF (Spondylolithesis L1/2/3 & L4/5)



TPS TLIF (Spondylolithesis L1/2/3 & L4/5)



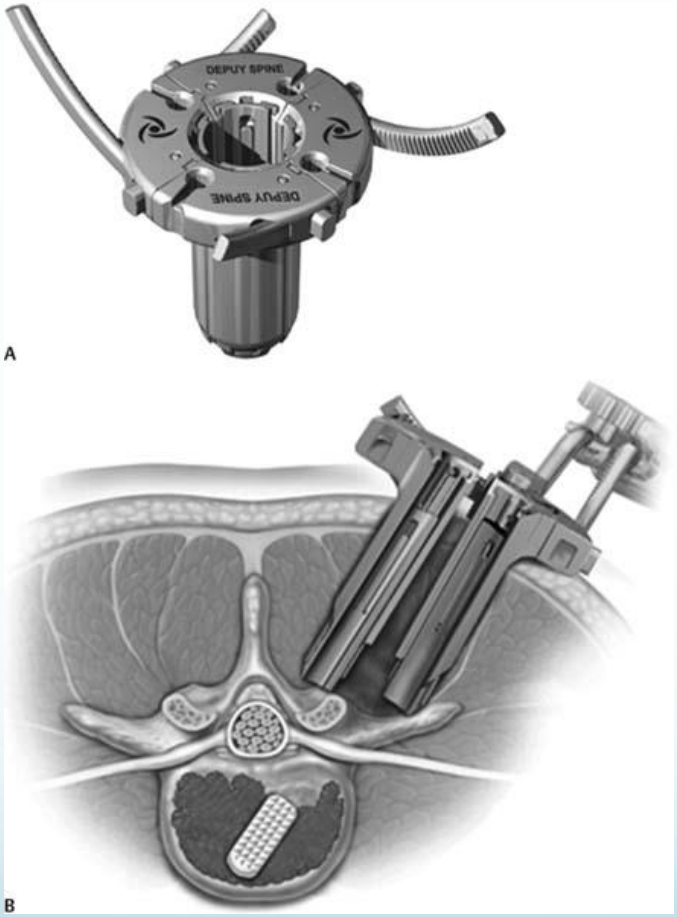
TPS TLIF (Spondylolithesis L2-S1)-1

TPS TLIF (Spondylolithesis L2-S1)-2

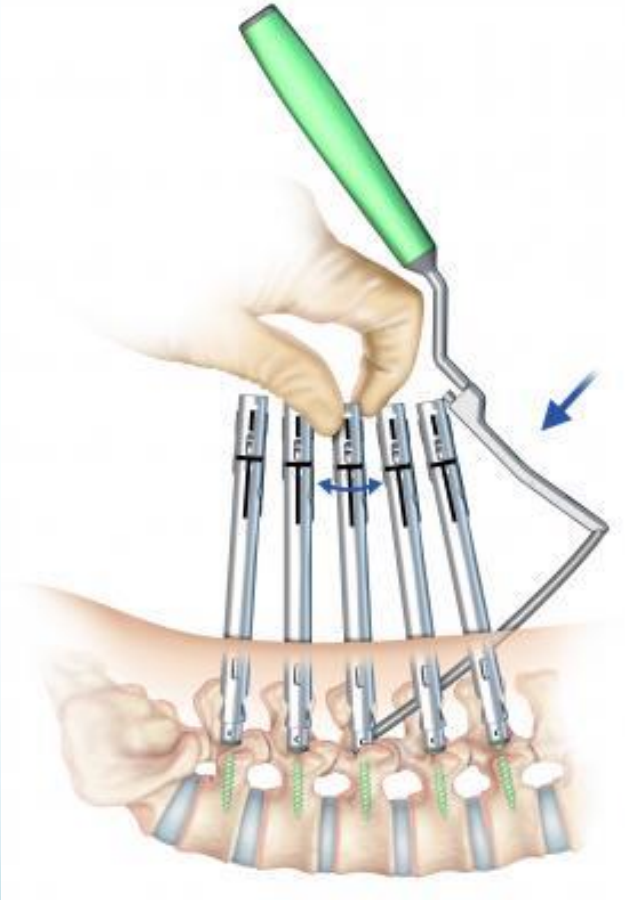
Minimal Invasive TLIF

- Smaller wound incisions
- Smaller scars
- Less surgical blood loss
- Less pain post-operation
- Shorter hospital stay
- Faster return to work and daily activities
- https://www.youtube.com/watch?v=sH426vdX8PQ

PIPELINE Access System
Minimally Invasive TLIF approach



Minimal Invasive VIPER 2 System



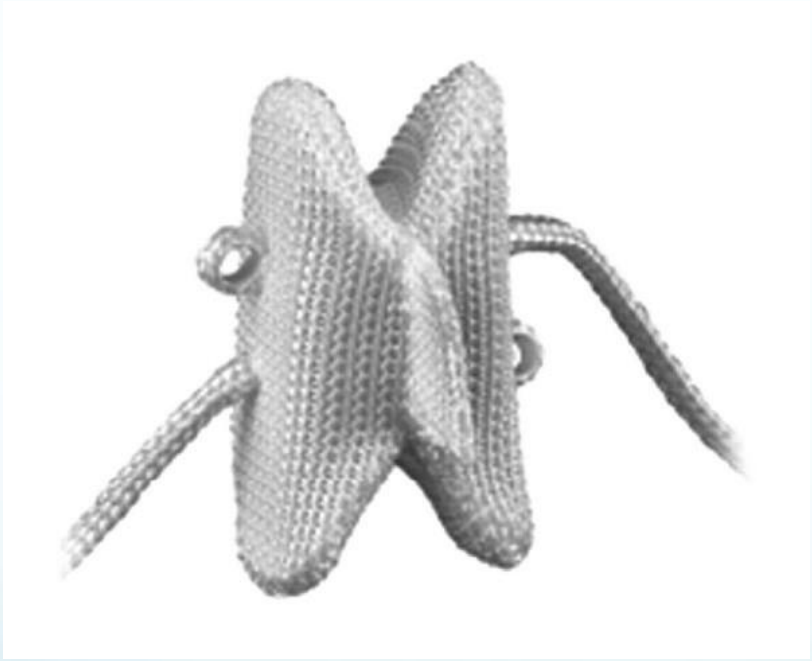
OPAL™ Cage System

MIS TLIF (L4/5)-1

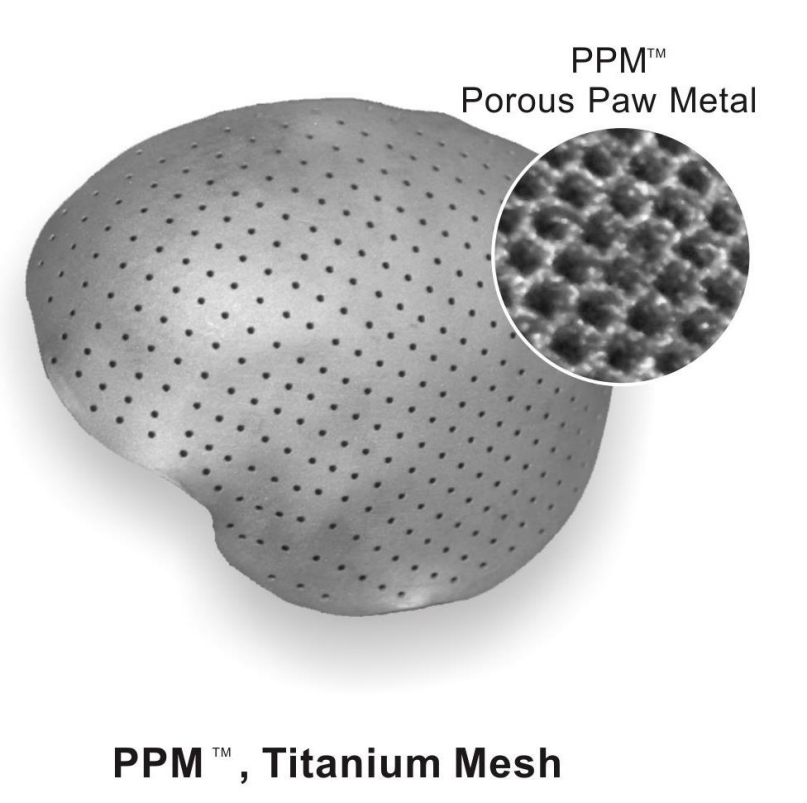
MIS TLIF (L4/5)-2

Interspinous Device-Coflex

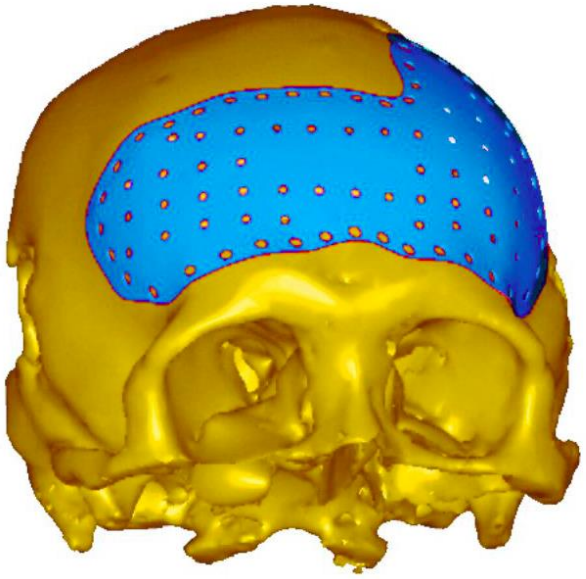
Interspinous Device-DIAM



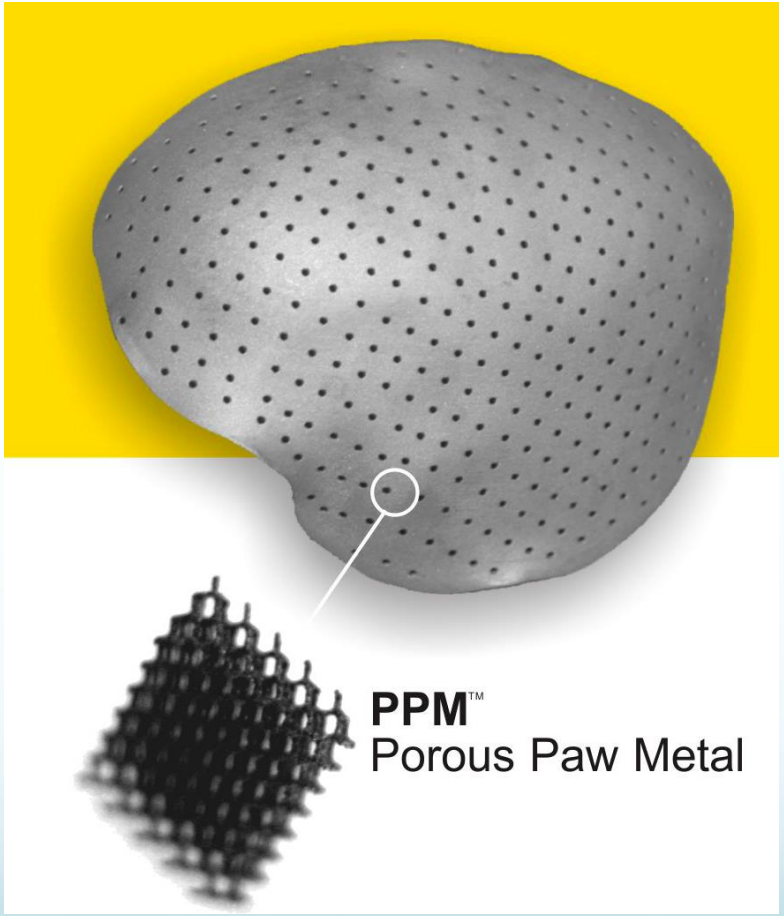
Cusmed 3D-Printed Cranial Titanium Mesh

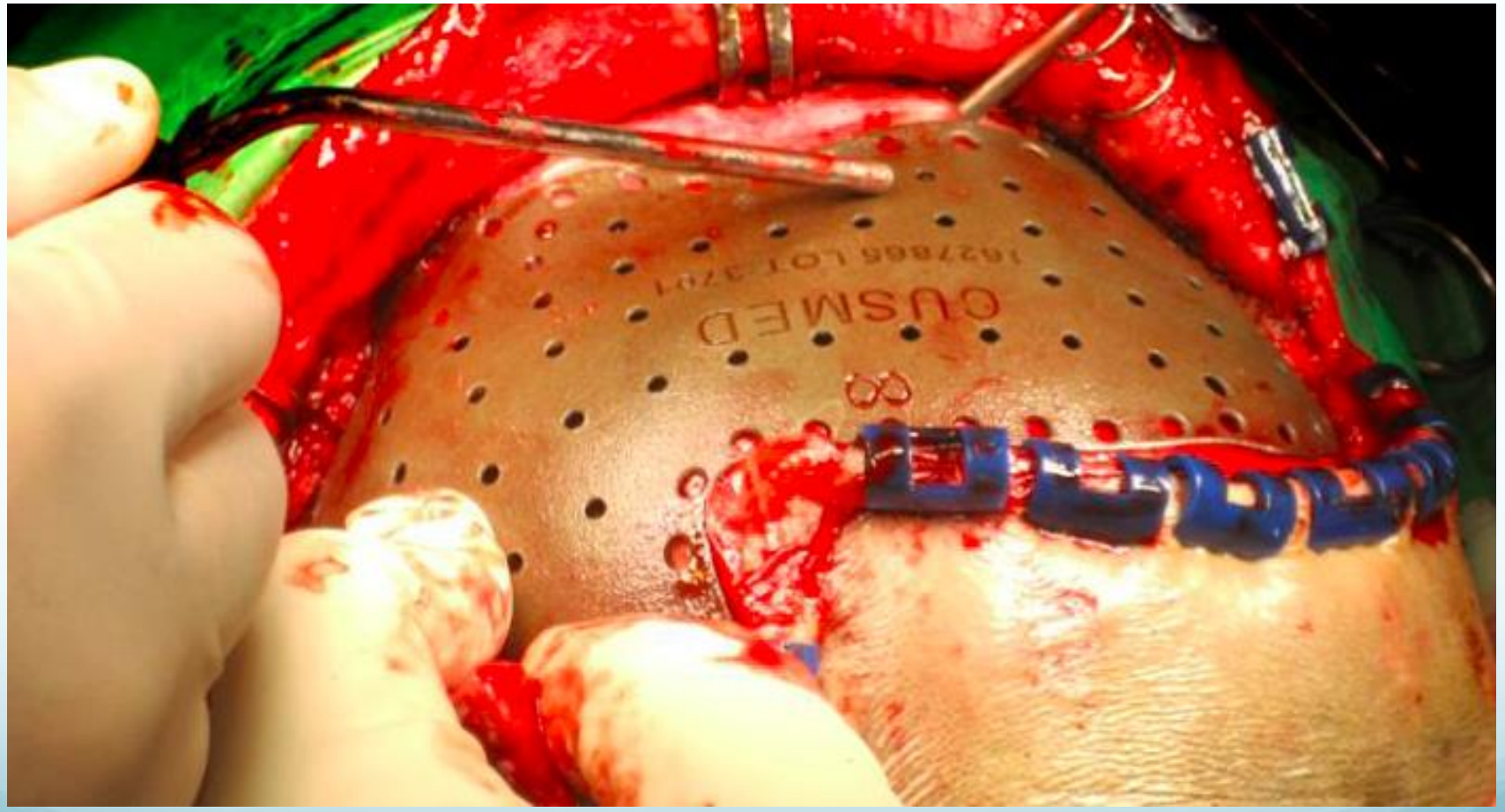


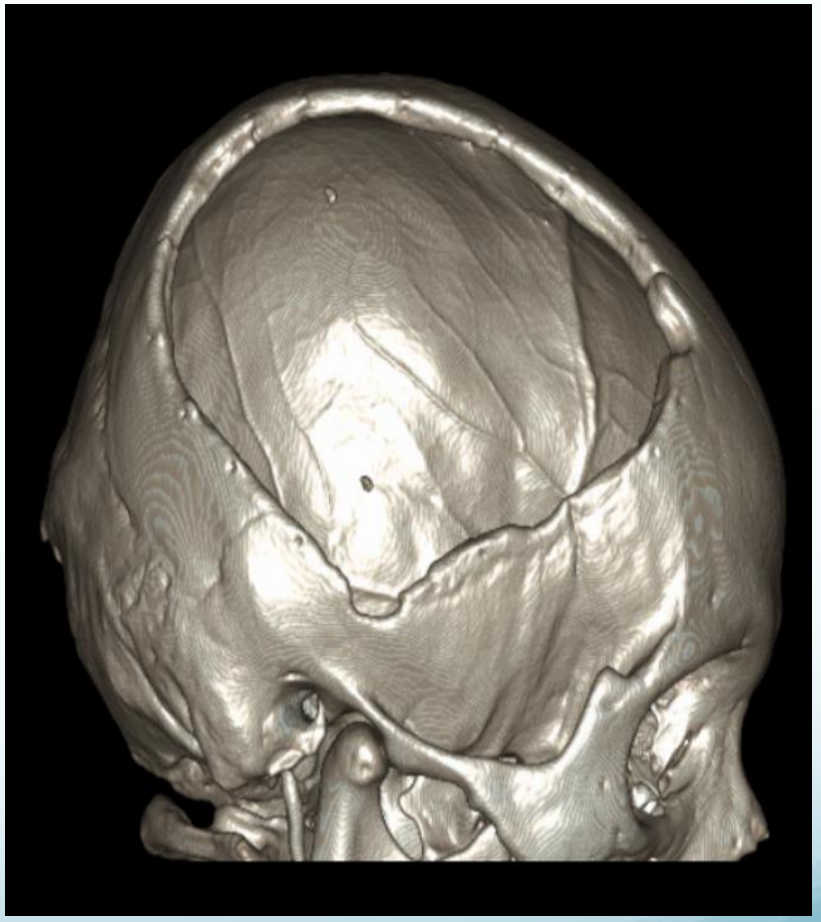
PPM™, Titanium Mesh



3D Reconstruction


PPM™
Porous Paw Metal


CUSMED

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DePuy Synthes
JOINT RECONSTRUCTION
COMPANIES OF Johnson & Johnson

- PEEK(聚醚醚酮): Polyetheretherketone
- PMMA(聚甲基丙烯酸甲酯): Polymethylmethacrylate (Acrylic)