

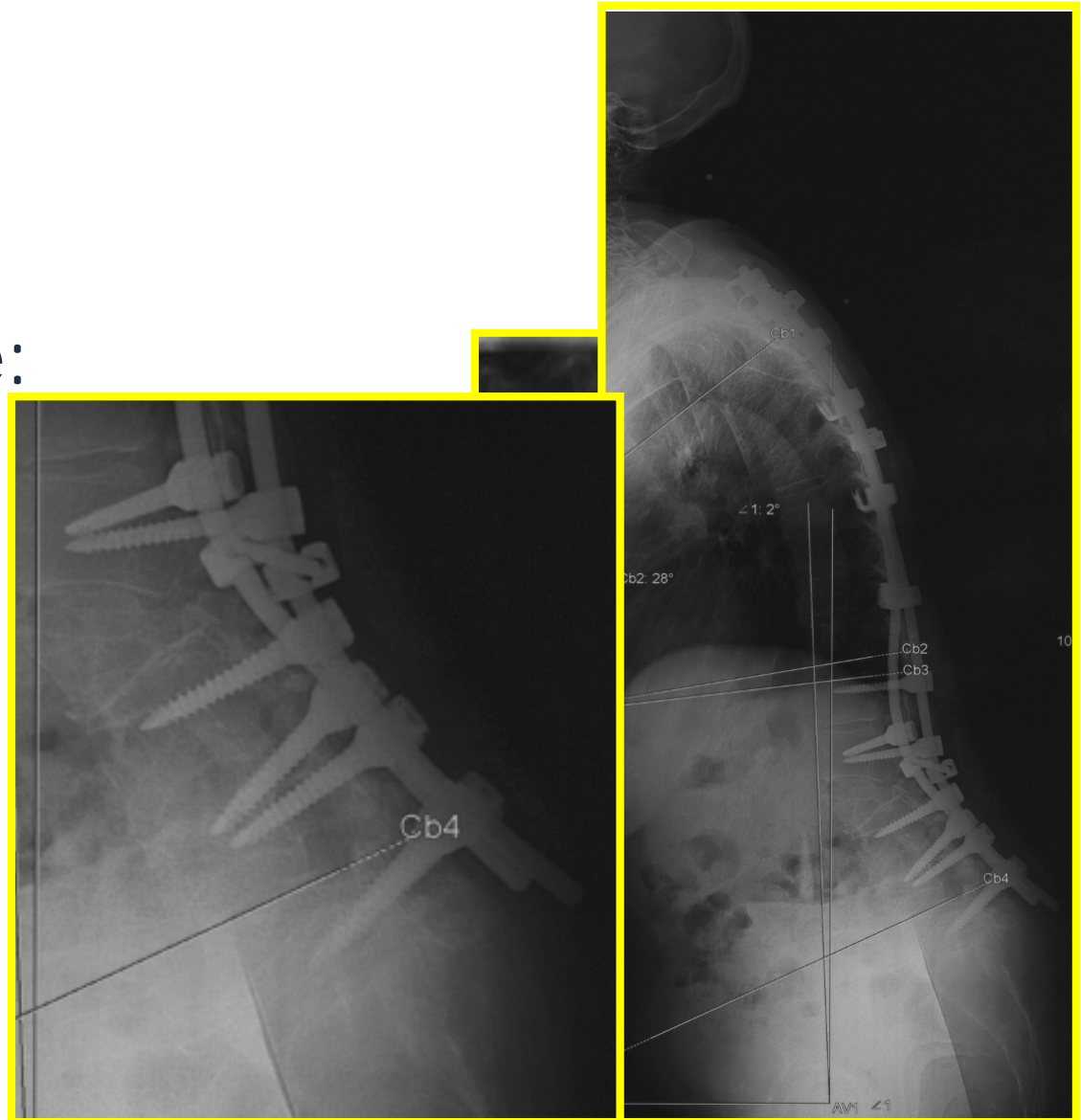
Iliac Fixation in spine deformity

IBRAHIM OBEID
Unité de Pathologie Rachidienne
Service du Pr VITAL
Bordeaux, France



Fusion to sacrum

- ↗ Operative time and complication
- ↗ Hardware failure: pseudarthrosis (3 to 83%)
 - Rod fracture
 - Screws fracture
 - Screws pull-out



Fusion to sacrum

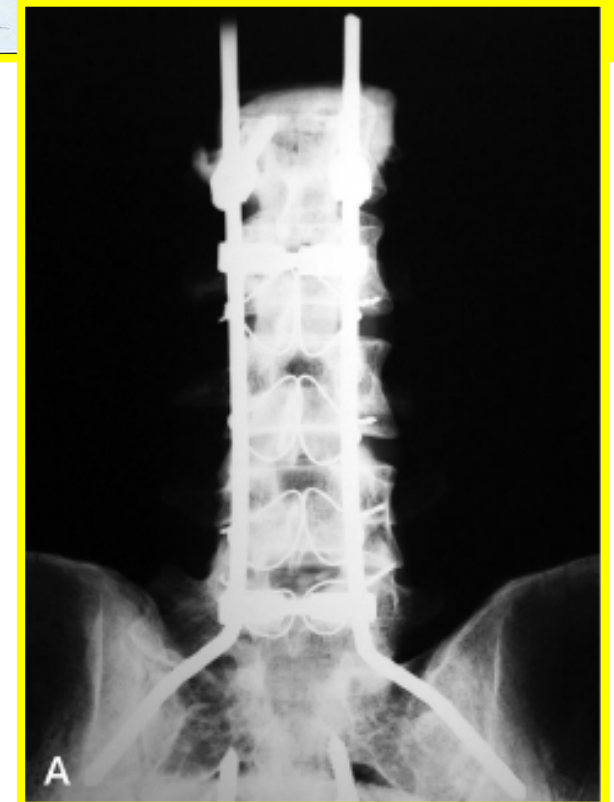
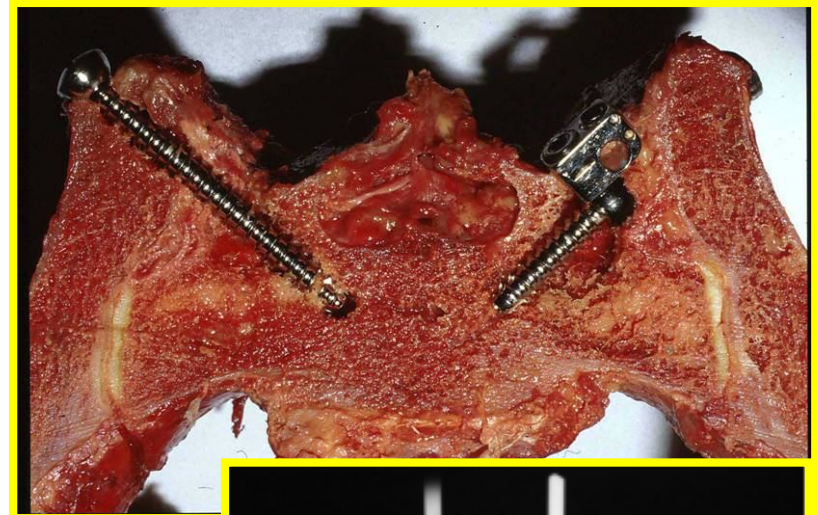
- **Risk factors for those mechanical failures:**

Kim, Yongjung et al. Spine feb.15 2005 and sept.15 2006

- Insufficient sacral fixation
- Postoperative sagittal imbalance
- Absence of anterior column Support
- Age at operation

Spinopelvic fixation

- Iliosacral screws
(Dubousset 1996 CP)
- Galveston rod
(neuromuscular CP)



SPINE Volume 27, Number 7, pp 776-786
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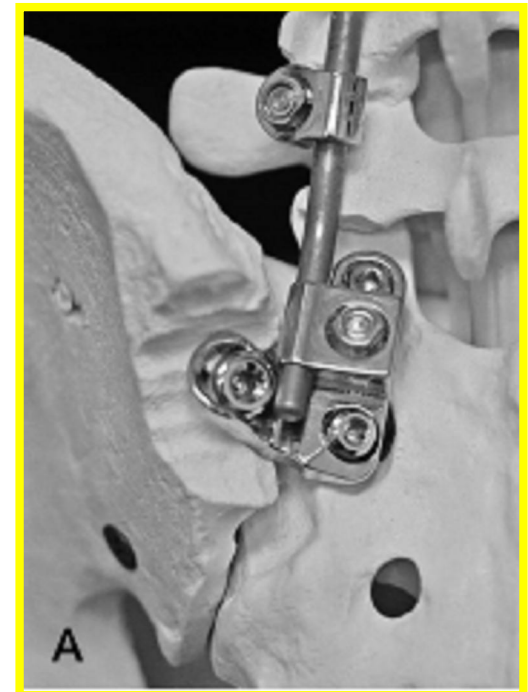
Outcome and Complications of Long Fusions to the Sacrum in Adult Spine Deformity

Luque-Galveston, Combined Iliac and Sacral Screws, and Sacral Fixation

Arash Emami, MD, Vedat Deviren, MD, Sigurd Berven, MD, Jason A. Smith, MD, Serena S. Hu, MD, and David S. Bradford, MD

Spinopelvic fixation

- S1 pedicle screws
- S1 and S2 pedicle screws
- Sacroiliac plate fixation (Colorado fixation): residual motion between plate and iliac and sacral screws

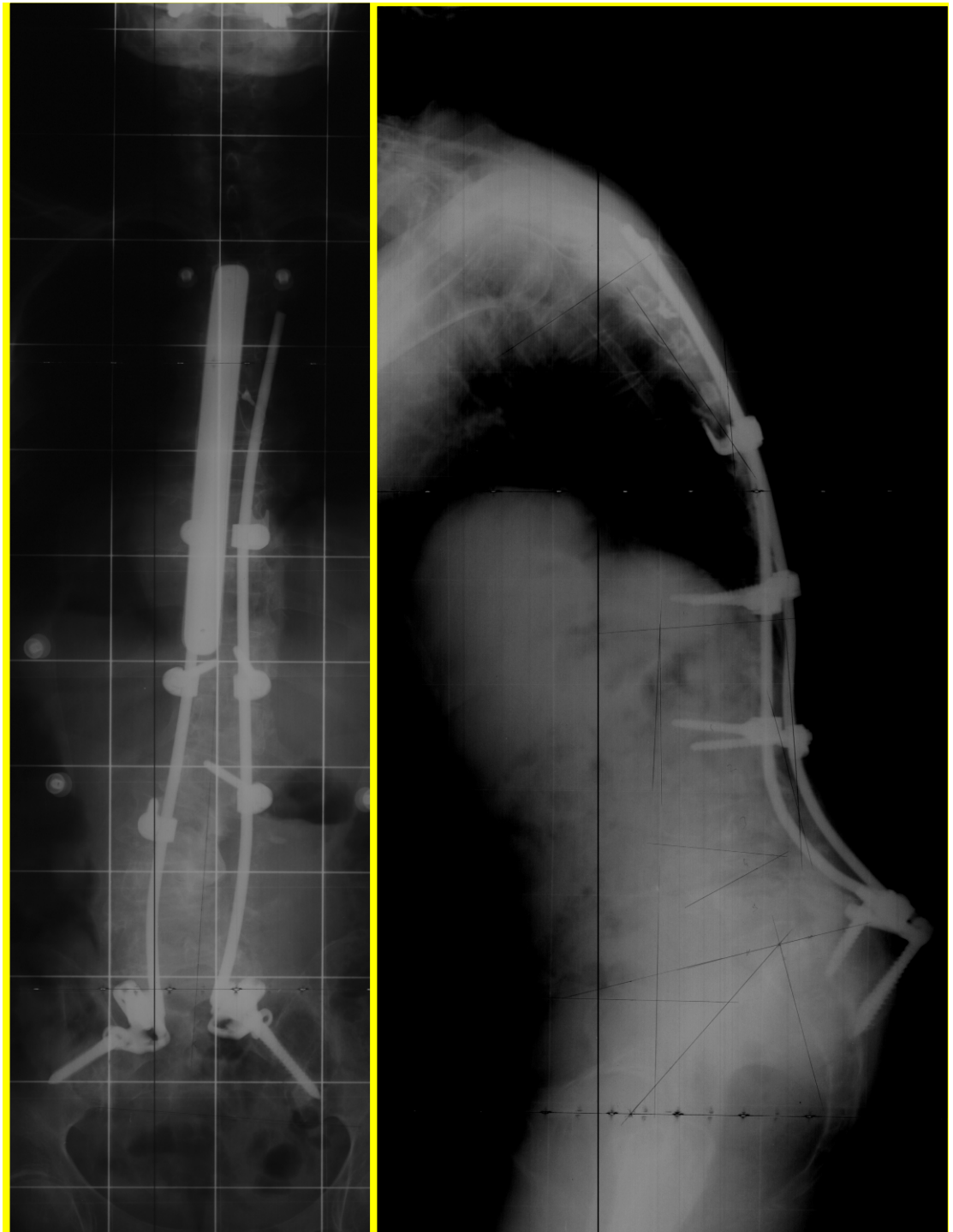


**Insufficient spinopelvic fixation
Absent anterior column Support**

62 year old woman

**L4 TPO for sagittal
imbalance**

**Mechanical failure
at 12 months PO**



Spinopelvic fixation

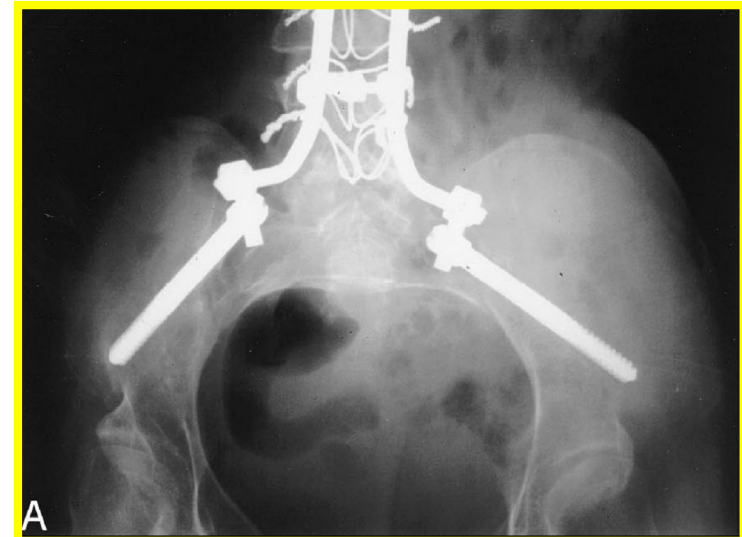
- Iliac Internal fixator
- Intraileiac instrumentation of the entire iliac column

SPINE Volume 26, Number 2, pp 166-173
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■ Extension of Fusions to the Pelvis in Idiopathic Scoliosis

Nazir C. Islam, MD, Kirkham B. Wood, MD, Ensor E. Transfeldt, MD, Robert B. Winter, MD, Francis Denis, MD, John E. Lonstein, MD, and James W. Ogilvie, MD

SPINE Volume 31, Number 19 Suppl, pp S144-S151
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Instrumentation-Related Complications of Multilevel Fusions for Adult Spinal Deformity Patients Over Age 65

Surgical Considerations and Treatment Options in Patients With Poor Bone Quality

Christopher J. DeWald, MD, and Thomas Stanley, MD

SPINE Volume 28, Number 6, pp 542-547
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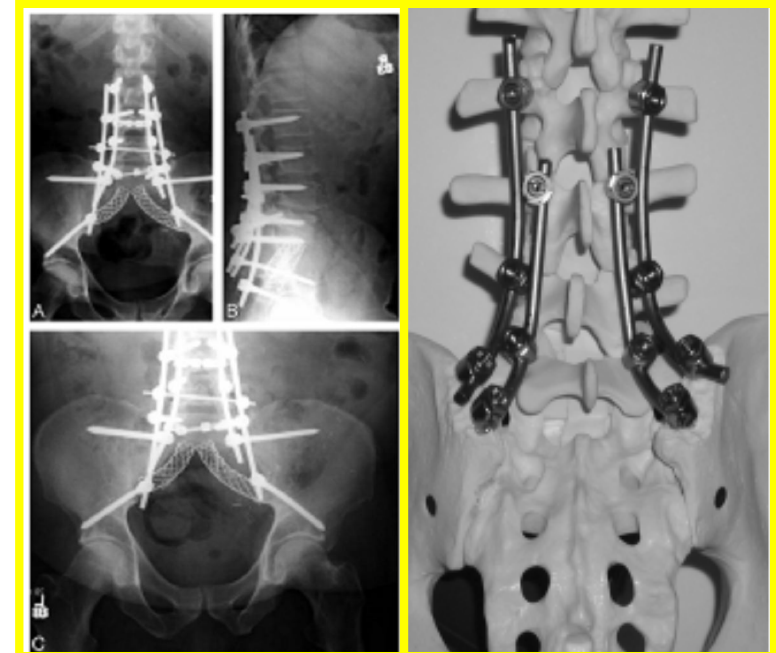
■ The Pylon Concept of Pelvic Anchorage for Spinal Instrumentation in the Human Cadaver

Richard M. Schwend, MD,* Romuald Sluyters, MD,† and Jan Najdzionek, MD, PhD†

SPINE Volume 31, Number 12, pp 1395-1401
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A Novel “Four-Rod Technique” for Lumbo-Pelvic Reconstruction: Theory and Technical Considerations

Francis H. Shen, MD,* Mark Harper, MD,* William C. Foster, MD,*† Ian Marks, PA-C,* and Vincent Arlet, MD*



Complete sacropelvic fixation

- Bicortical S1 fixation
- Iliac fixation
- Circumferential fusion (360°)

SPINE Volume 31, Number 19 Suppl, pp S144-S151
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Instrumentation-Related Complications of Multilevel Fusions for Adult Spinal Deformity Patients Over Age 65 Surgical Considerations and Treatment Options in Patients With Poor Bone Quality

Christopher J. DeWald, MD, and Thomas Stanley, MD

SPINE Volume 31, Number 3, pp 303-308
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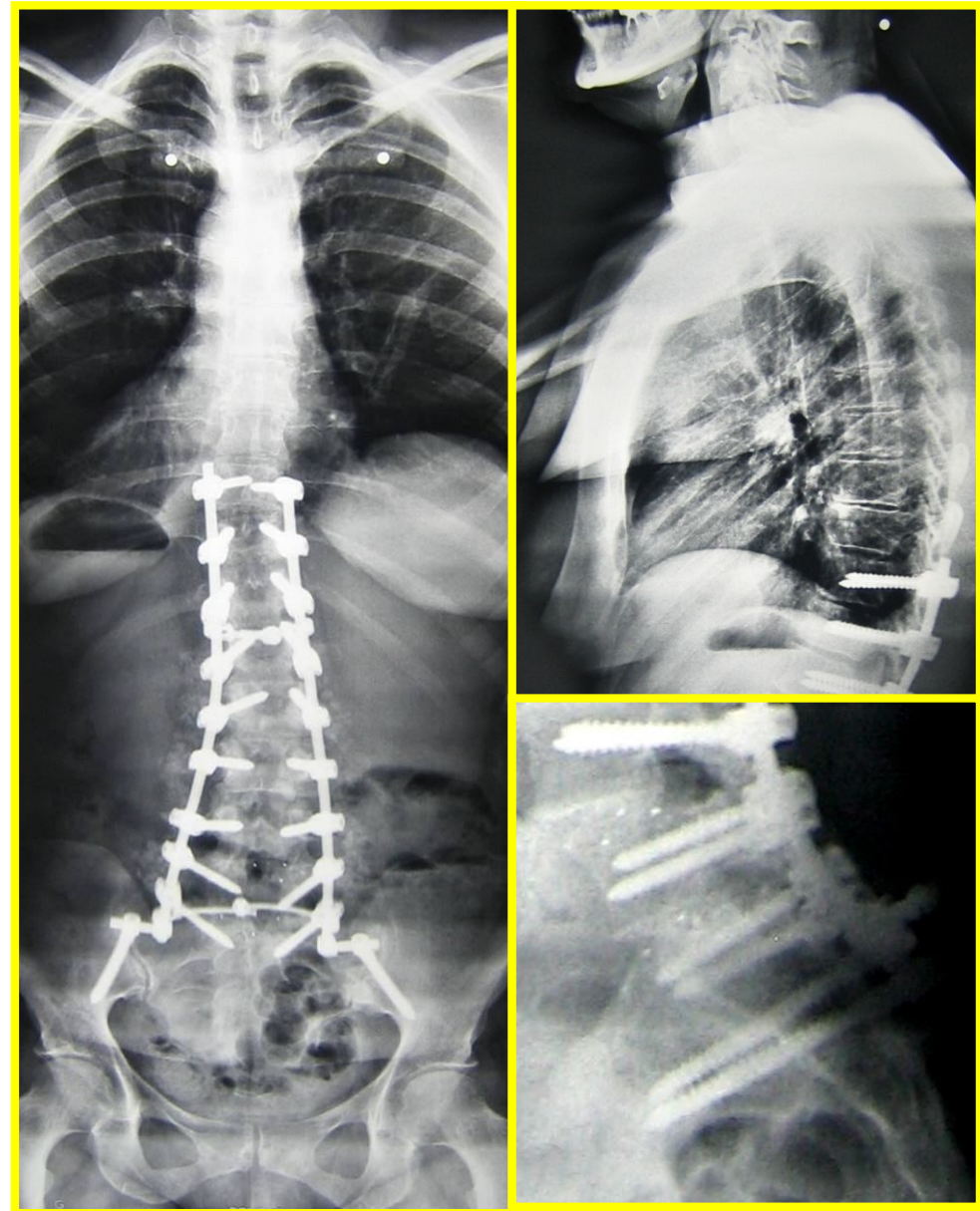
Minimum 5-Year Analysis of L5-S1 Fusion Using Sacropelvic Fixation (Bilateral S1 and Iliac Screws) for Spinal Deformity

Kuniyoshi Tsuchiya, MD, Keith H. Bridwell, MD, Timothy R. Kuklo, MD,
Lawrence G. Lenke, MD, and Christine Baldus, RN

SPINE Volume 26, Number 18, pp 1950-1955
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S1 Screw Bending Moment With Posterior Spinal Instrumentation Across the Lumbosacral Junction After Unilateral Iliac Crest Harvest

Gary M. Alegre, MD, Munish C. Gupta, MD, Brian K. Bay, PhD, Tait S. Smith, PhD, and Justin E. Laubach, BS



Indications

Adult Scoliosis

- **First hand adult scoliosis**

Keith H. Bridwell, et al SPINE Volume 28, Number 20S, pp S234-S242 2003

- Spondylolisthesis at L5-S1
- Stenosis at L5-S1 (foraminal)
- Severe degenerative disc disease at L5S1
- Prior laminectomy at L5-S1
- Oblique take-off at L5-S1

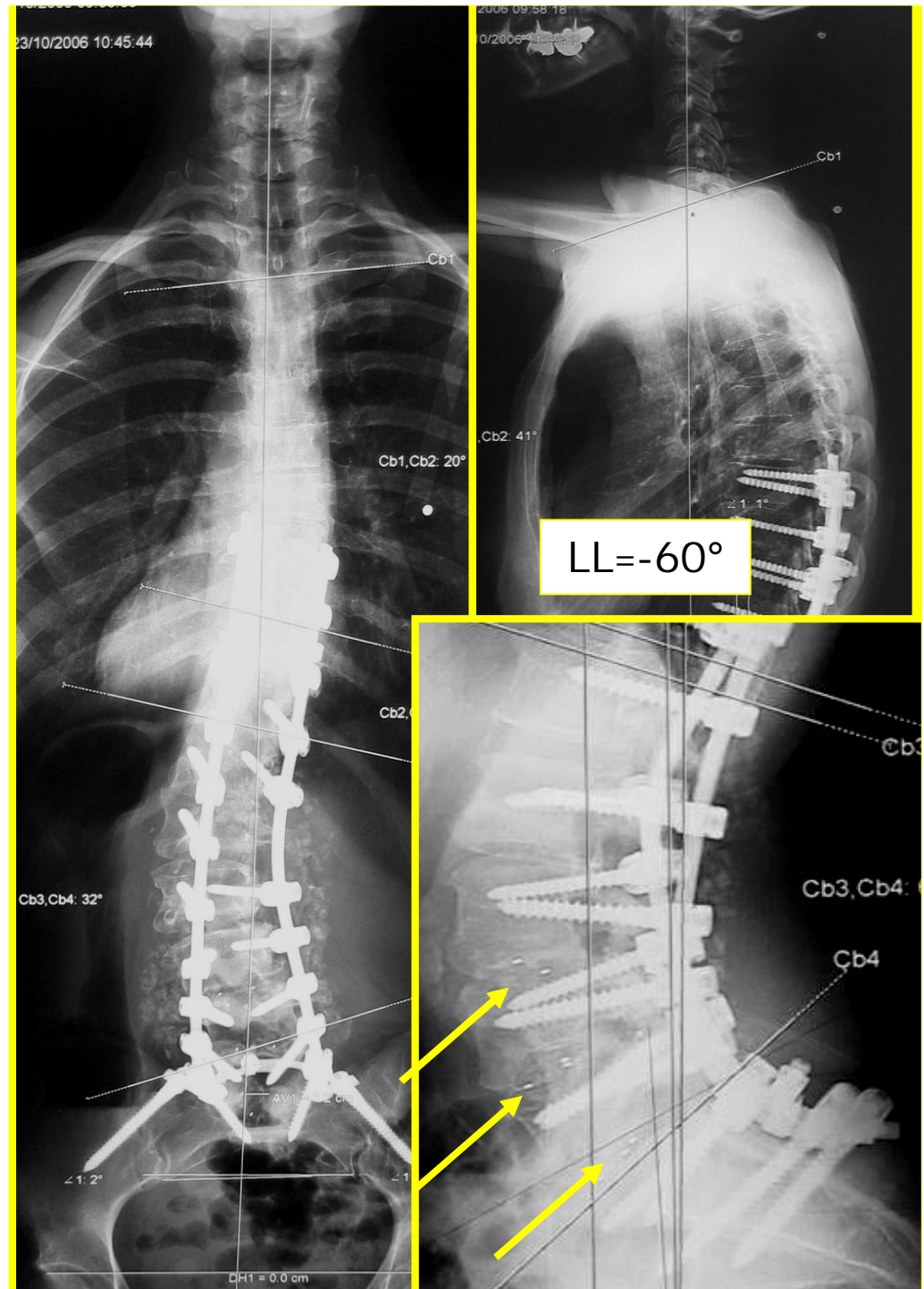
First hand

57 year old woman

L5 Left sciatica with a
foraminal L5S1 stenosis
and L3L4 laterolisthesis

Radiological lumbar curve
progression

Correction and fusion
Posterior approach 360°
multilevel fusion (L3 to
S1)



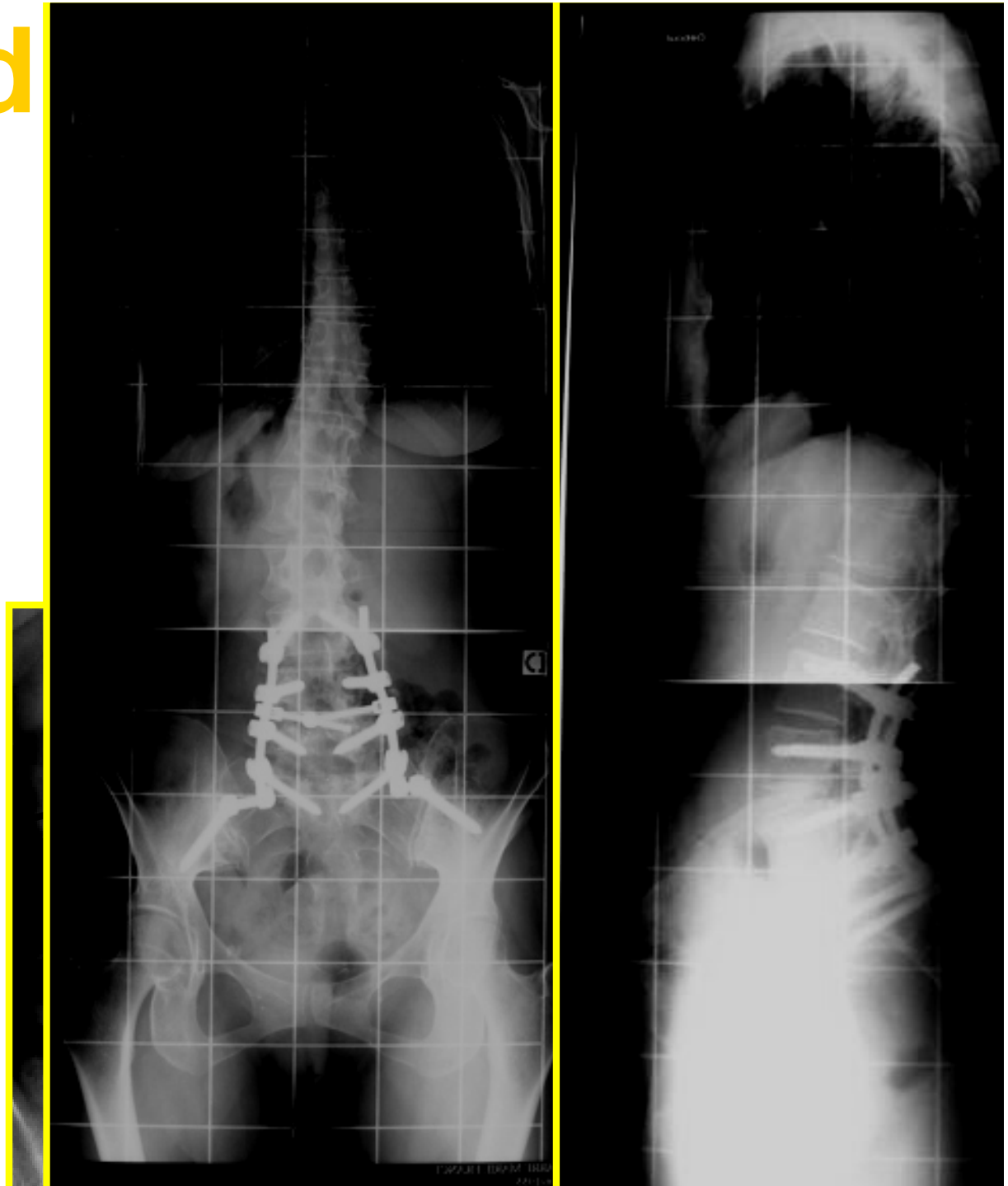
First hand

51 year old woman

Left L5 sciatica

Correction of L5
oblique take off and
L3L4 laterolisthesis

Good correction for
non instrumented
lumbar scoliosis



Redo adult scoliosis

65 year old man

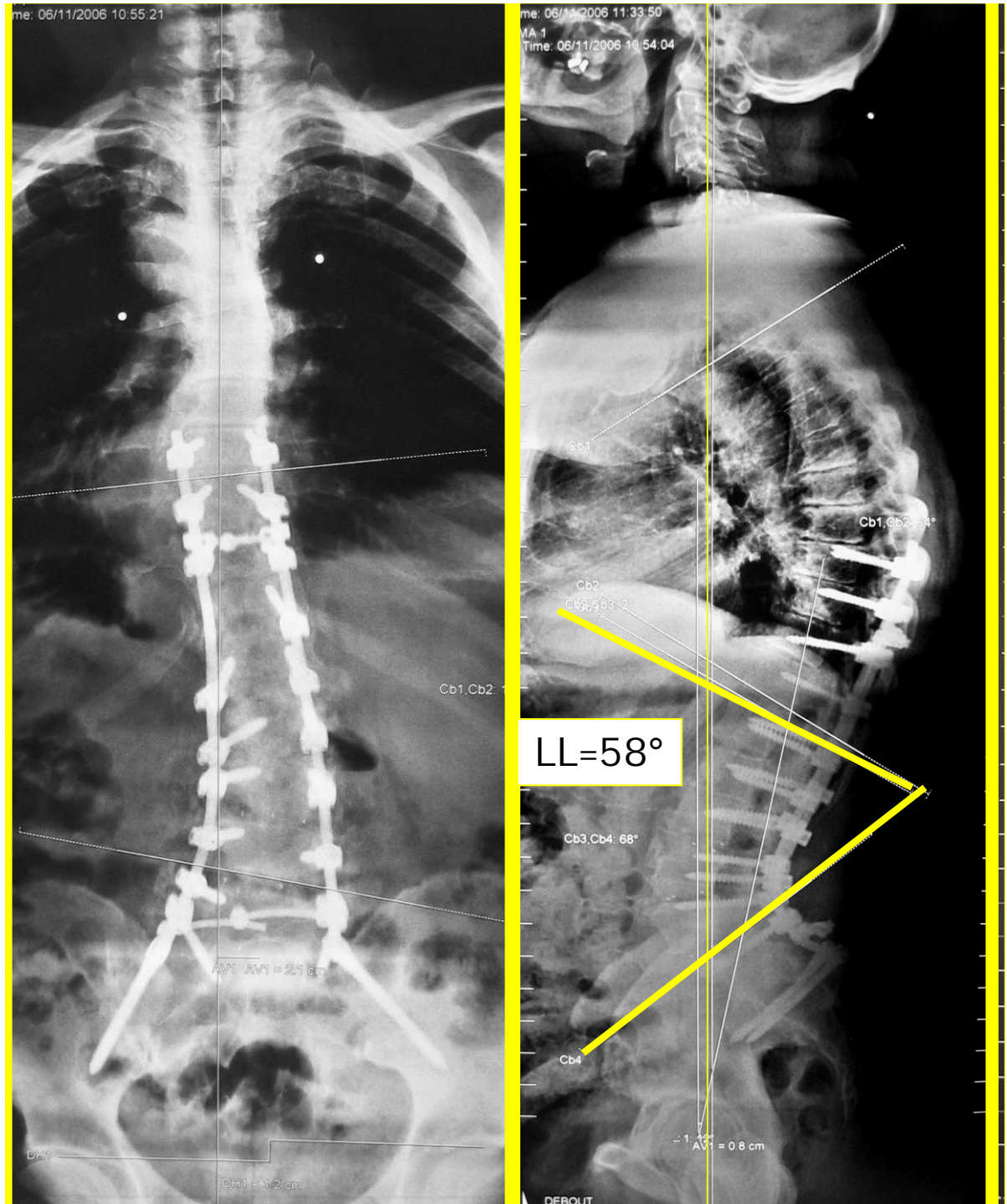
1 year after surgery

Distal disc degeneration (L5S1 SPL)

Pseudarthrosis (L3 to L5)

Sagittal imbalance

3 level SPO with 360° fusion



Redo adult scoliosis

67 year old woman

18 months after surgery

Distal disc degeneration (L5S1)

Pseudarthrosis (L3 to L5)

Sagittal imbalance

2 level SPO with 360° fusion



Sagittal Imbalance

TPO

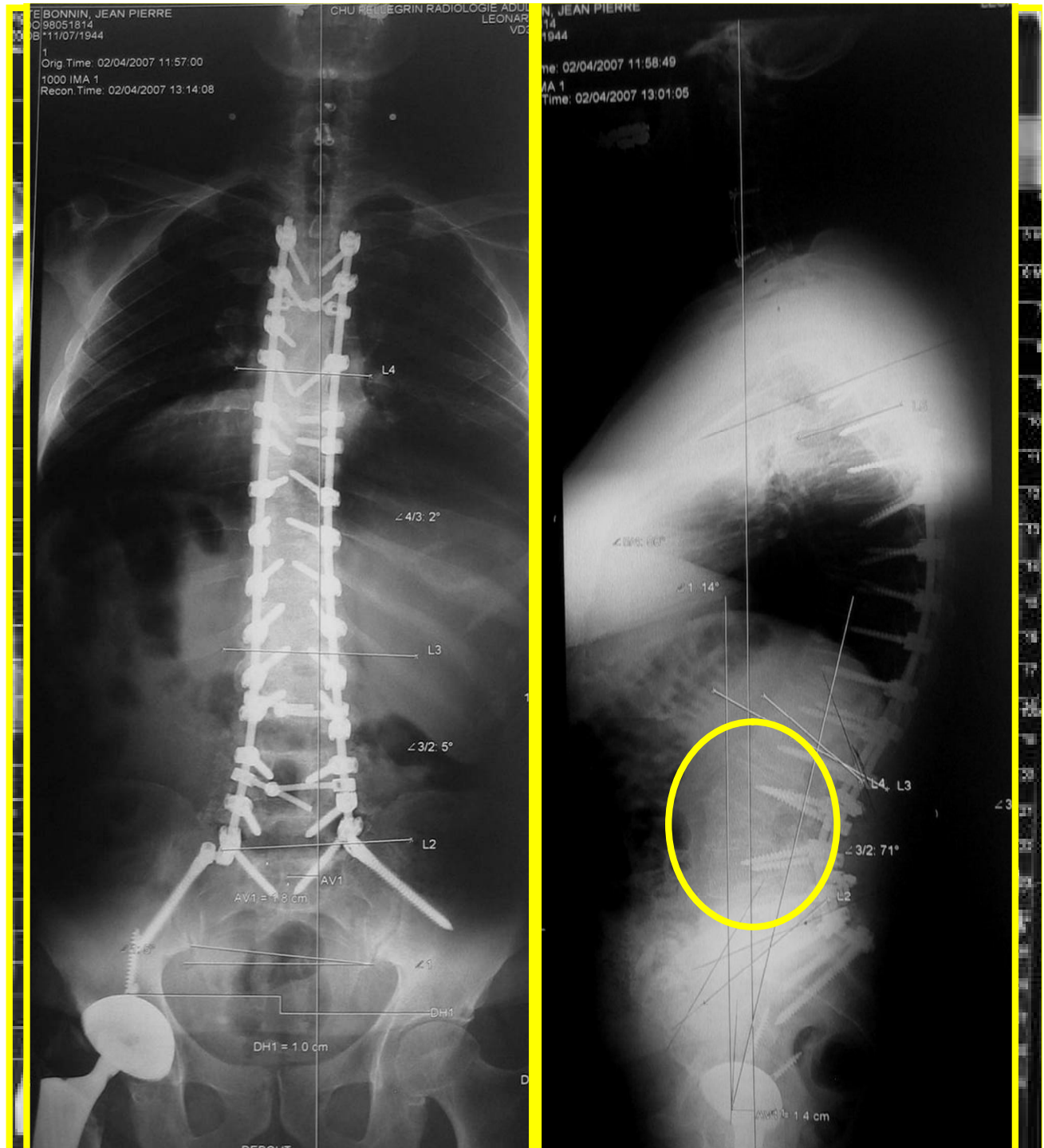
68 year old man

Positive Sagittal imbalance after multiple lumbar spine surgery

L5S1

Pseudarthrosis

L3 TPO



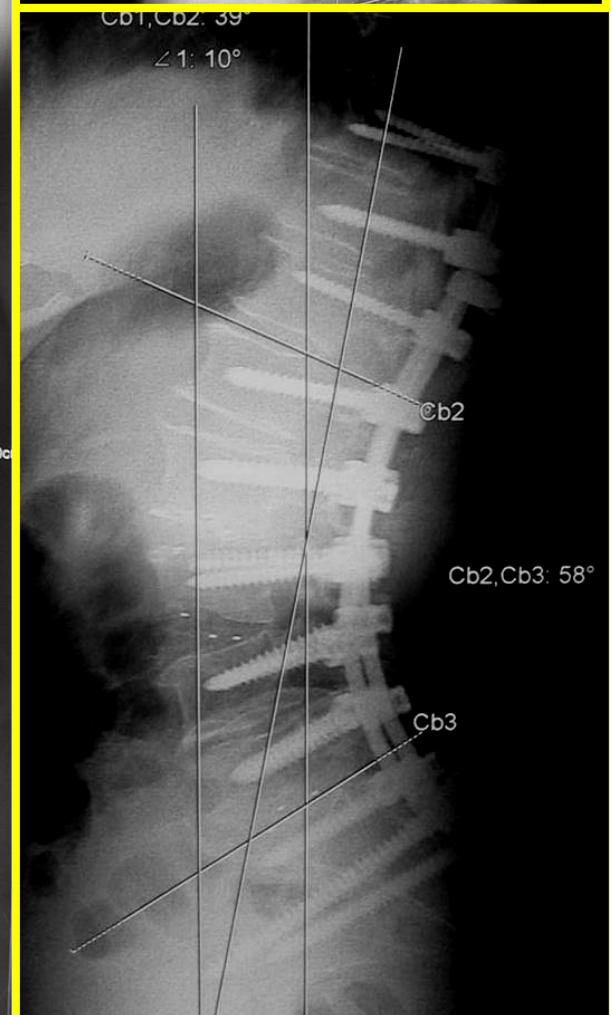
SPO

54 year old woman

Degenerative lumbar kyphosis

Anterior Sagittal imbalance

4 SPO

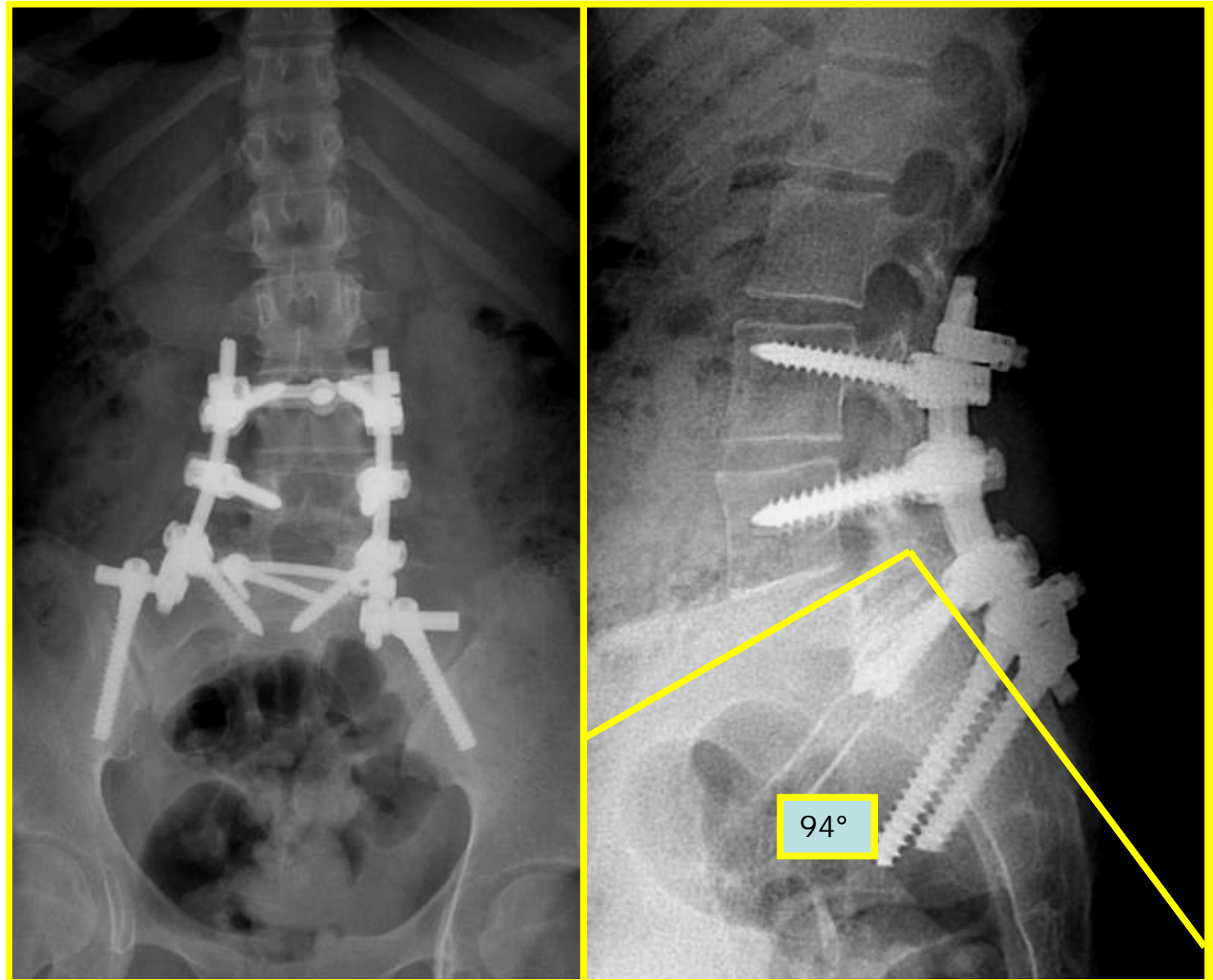


High grade spondylolisthesis

13 year old girl

First surgery for isthmic SPL

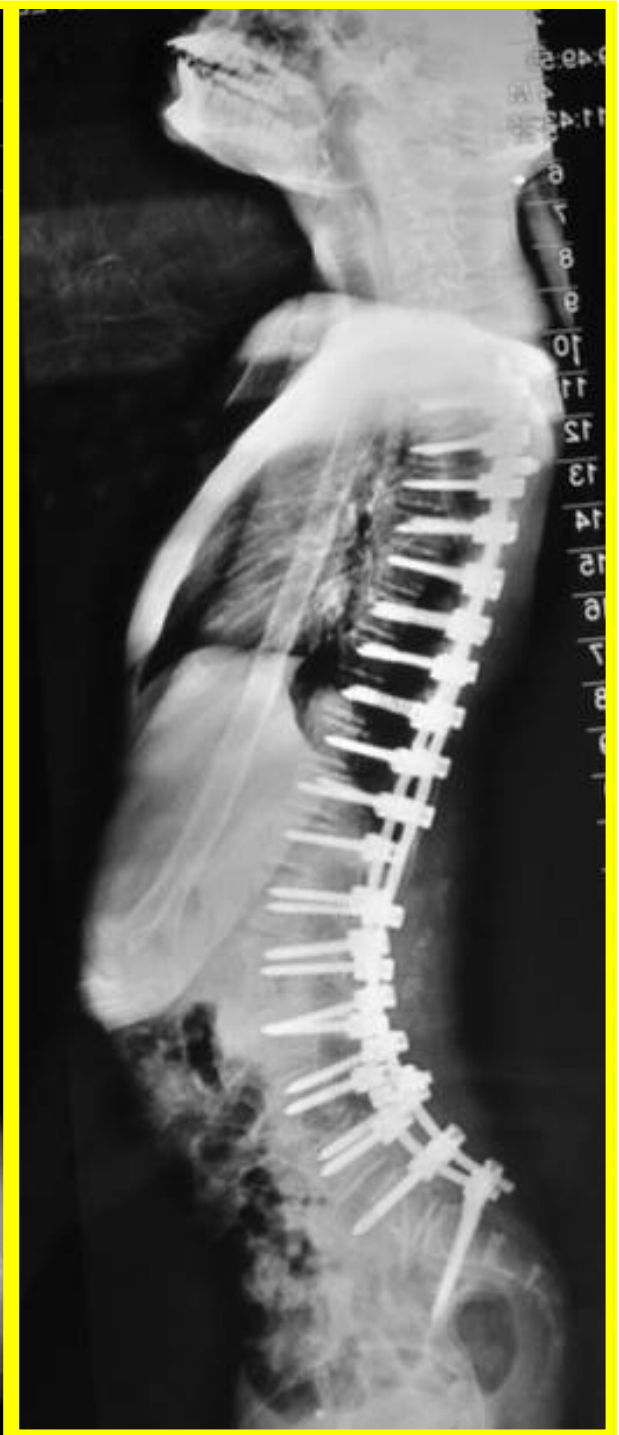
L5 on S1
Ptosis 3 years after surgery



Neurological Spinal Column Deformities

Cerebral Palsy

16 year old no walking boy



Post Traumatic Paraplegia

18 year old man



Traumatic

24 year old man

L5 Traumatic
isthmus
fracture

S1 left pedicle
fracture

L3 A22 fracture

L2L4 fixation
without fusion

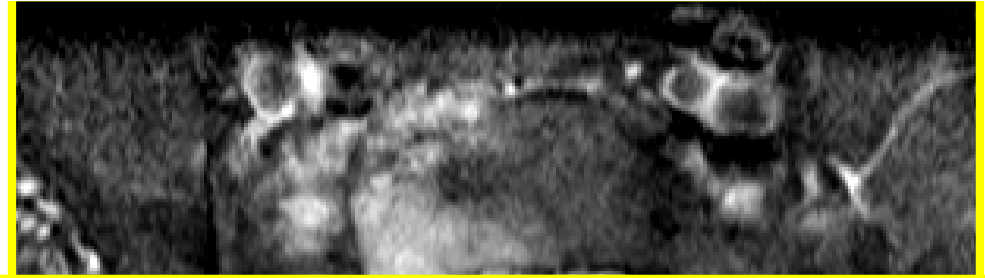
L5S1 360°fusion



Tumor

72 year old
woman

S1
metastasis
of thyroid
carcinoma



Our Experience

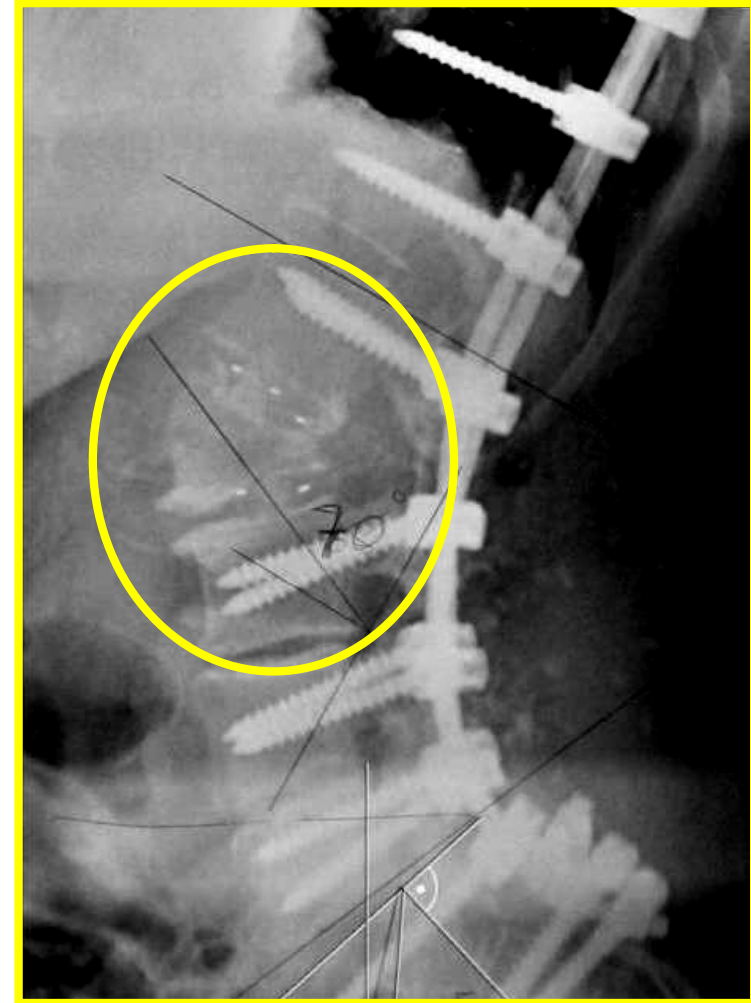
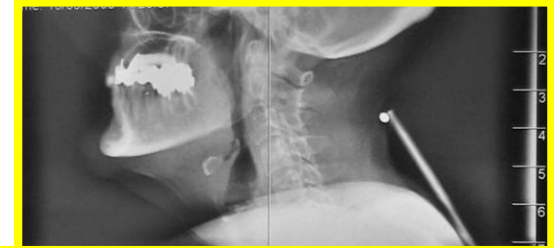
- Since 3 years: Spinal System I liac Fixation
- 46 adult spine deformities fused to sacrum
- Posterior approach only (except one patient)
- TLIF

Other Indications

- 3 SPL grade 5 (spondyloptosis)
- 2 traumatic
- 4 pediatric neuromuscular scoliosis

TLIF indications

- Lumbar or Lumbosacral Pseudarthrosis
- Fusion to Sacrum
- Level of SPO (up to 4 cages)
- Over and Below TPO



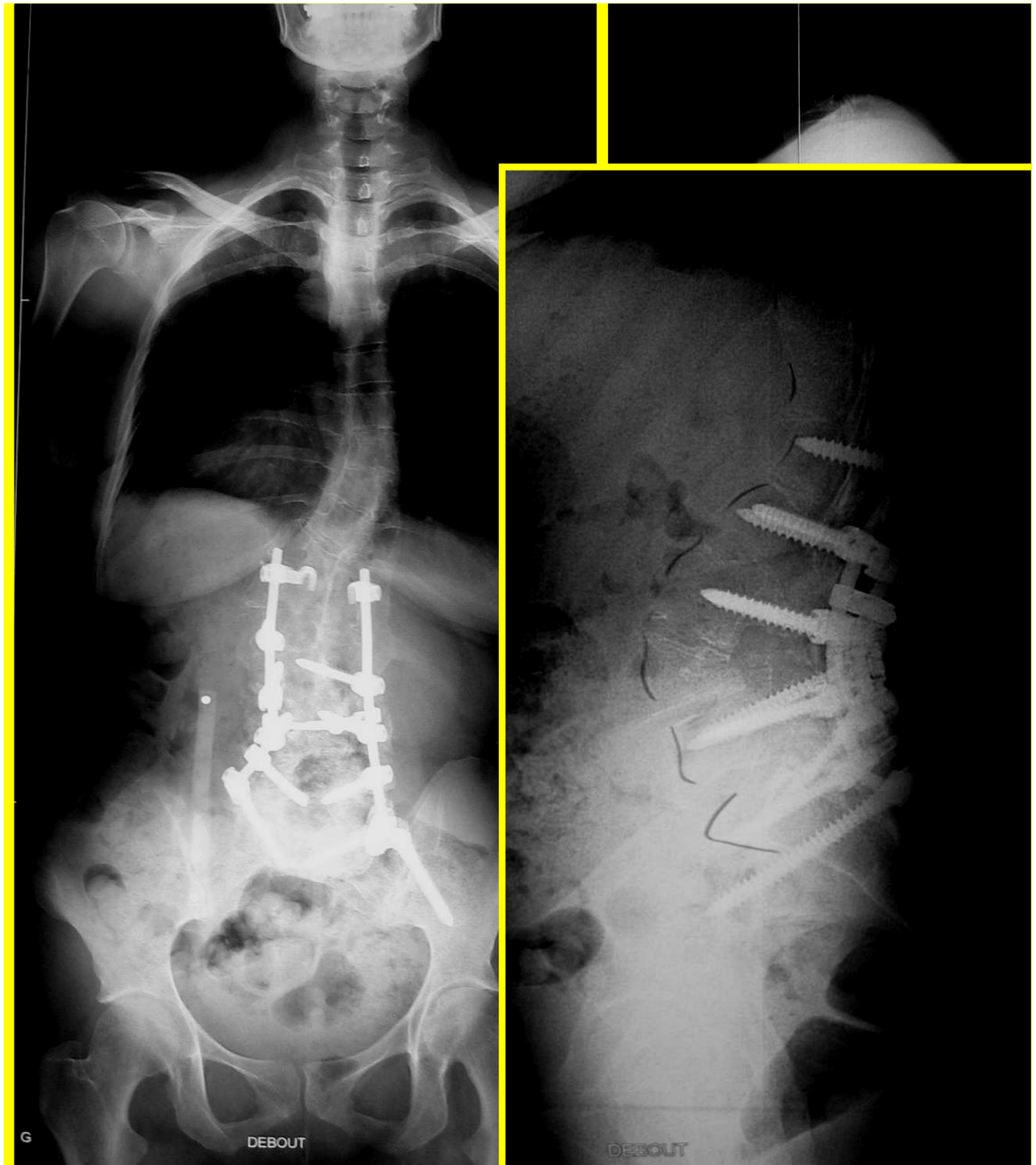
Unilateral

36 year old woman

Flat back after
scoliosis surgery

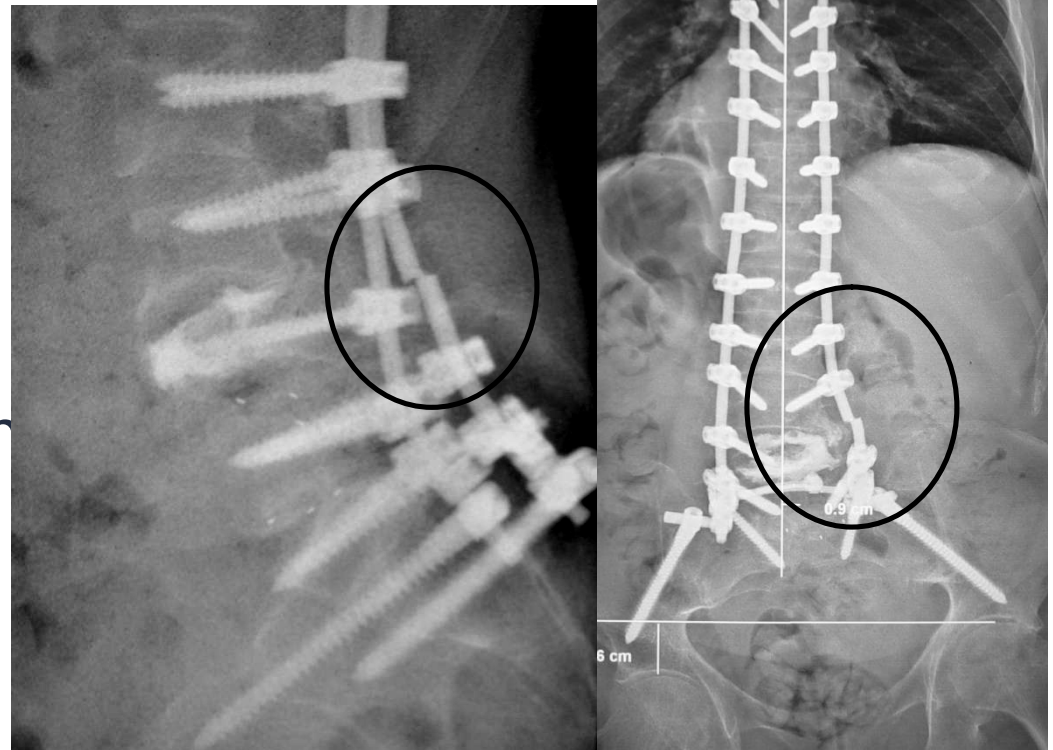
L4 TPO

Technical difficulties
to put left iliac screw



Results

- 1 chronic infection and screws removal
- 2 Pseudarthrosis
- No S1 screws fracture or pull-out
- No iliac screws related complication



Iliac screws removal

- Young patient (SPL)
- Symptomatic patient

Conclusion

Efficacy

Reproducibility
and accuracy

Safety

Sacroiliac joint
problem??

