

Ankylosing spondylitis: Thoracolumbar and cervical osteotomies



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Conflict of interest

I have no consultancy or commercial relationship to any commercial (implant) company

- in any way related to this lecture,
- nor to any of the implants shown in the slides,
- nor to my visit to Brasil.

The travelcosts were paid by Congresso de Cirurgia.

I receive no speakers fee.

Presentation outline

- Introduction
 - Ankylosing spondylitis
- Thoracolumbar osteotomies
- Cervical osteotomies
 - Our preferred technique
 - Case example
- Conclusions / recommendations

Introduction

- Chronic
- Inflammatory
- Ankylosis of spine, SI joints and hips
 - Hip contracture
 - Thoraco-lumbar kyphosis
 - Cervical kyphosis
- Male > female
- HLA-B27
- (auto) - immune disturbance
 - Good response to anti-TNF α drugs



- Often biologically old
 - Comorbidity
 - Colitis
 - Restrictive pulm. disease
 - Diaphragmatic respiration
 - Reduced immune response
 - Frequent alcohol en nicotine use?
 - Osteoporosis
-
- infections
- spinal fixation
- Serious social implications
 - Surgical aftercare

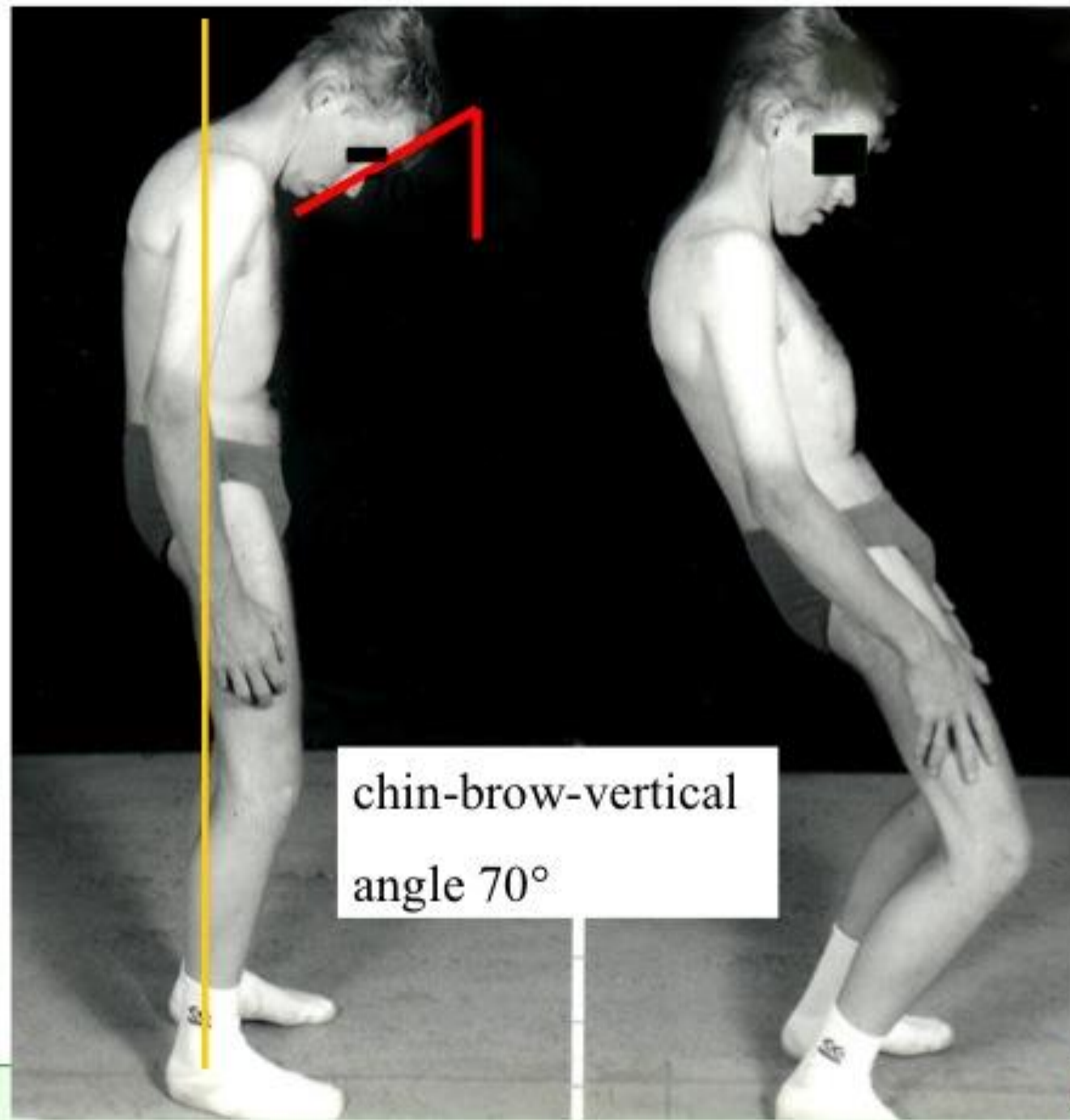
Spinal osteotomies



**After lumbar
osteotomy**



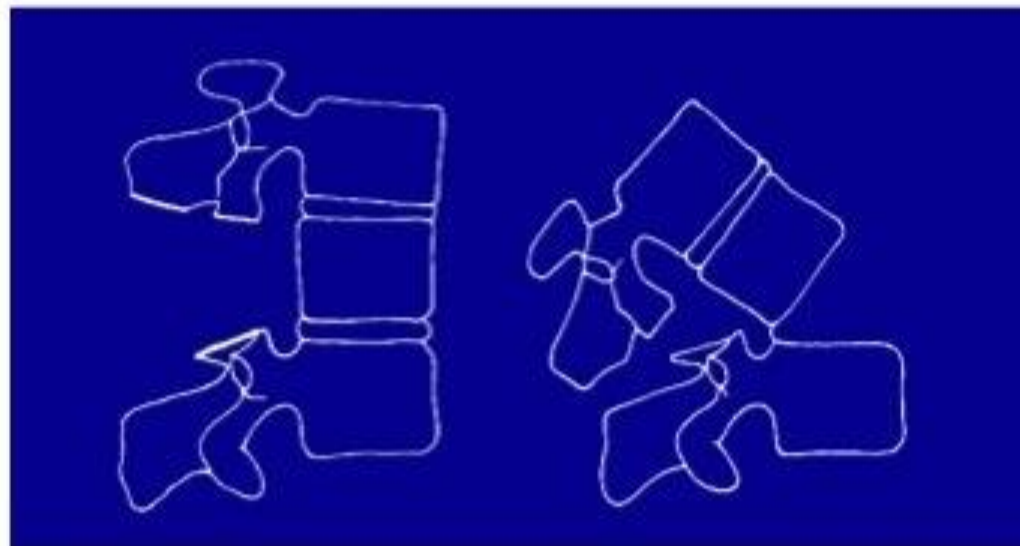
**After cervical
osteotomy**



chin-brow-vertical
angle 70°

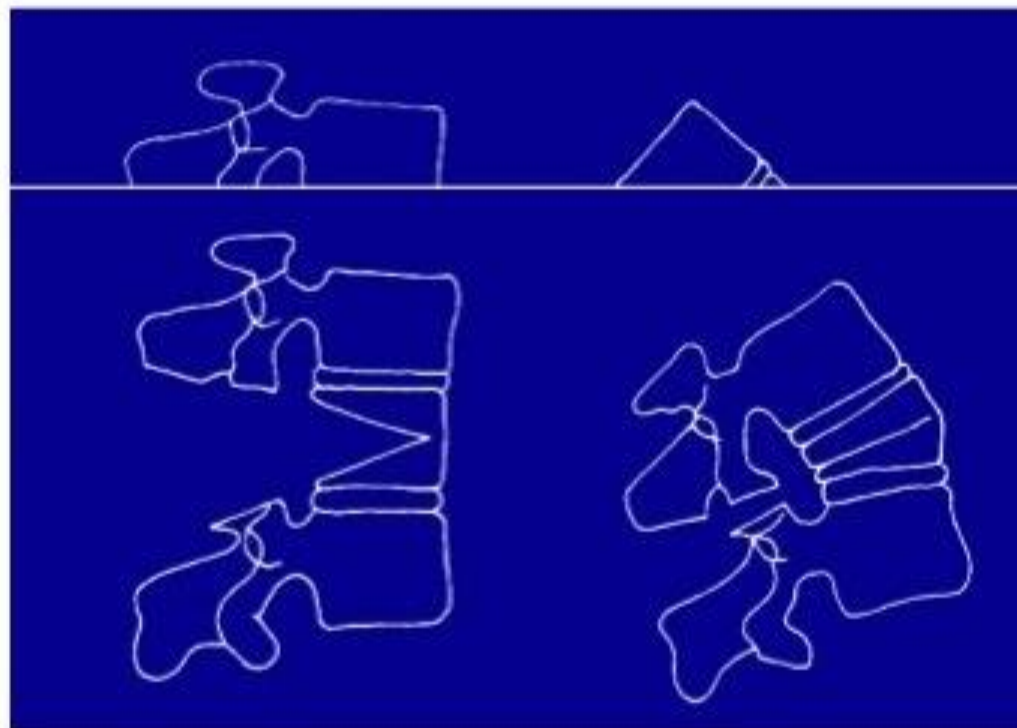
Lumbar osteotomies

- open wedge



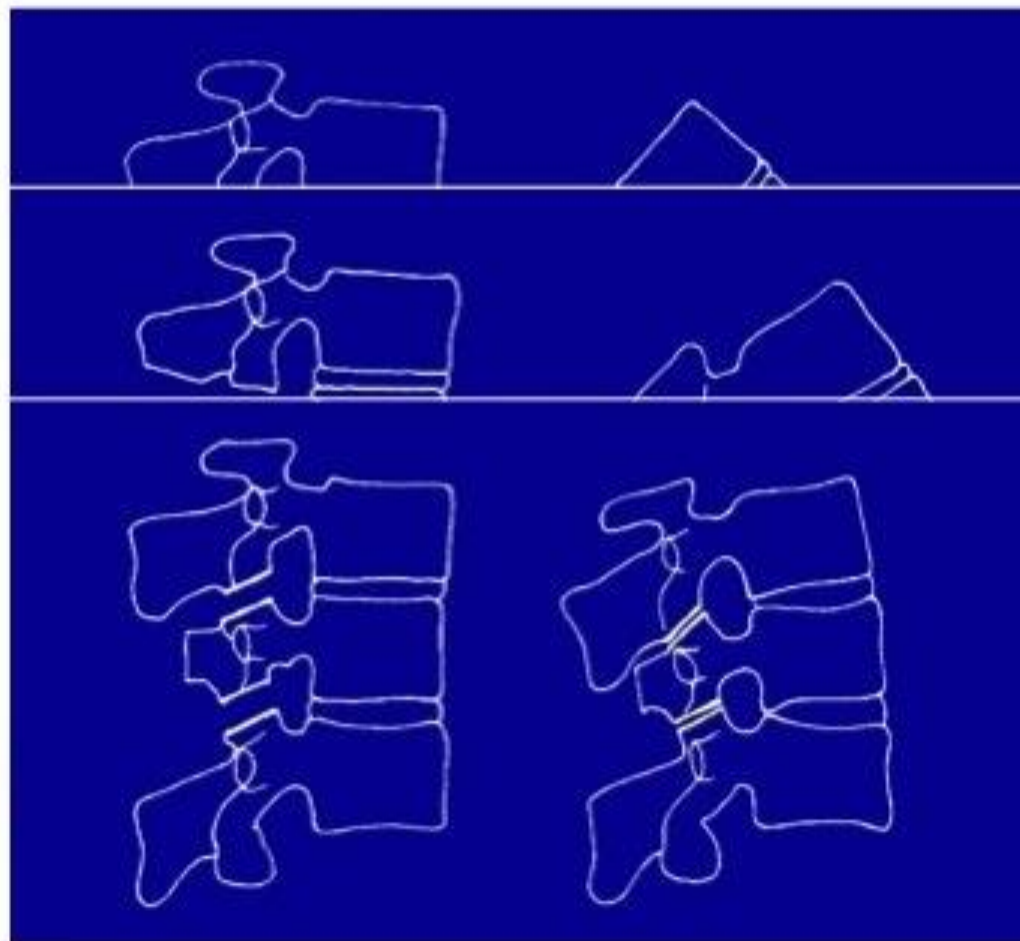
Lumbar osteotomies

- ~~open wedge~~
- Closing wedge (PSO)

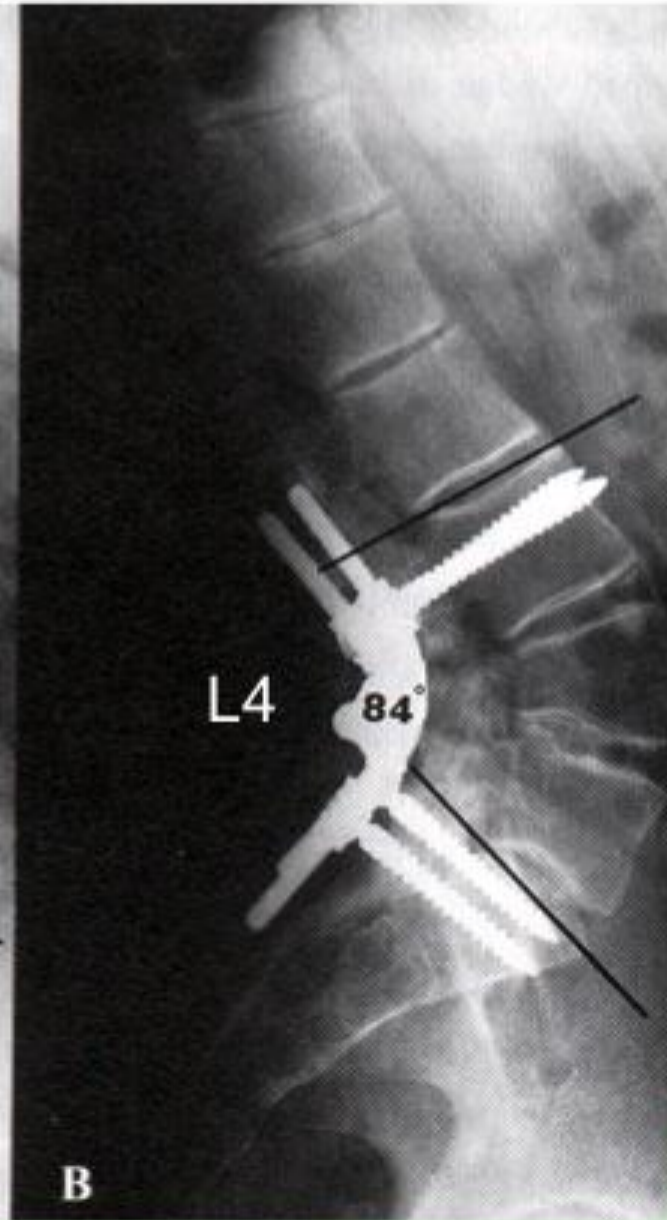
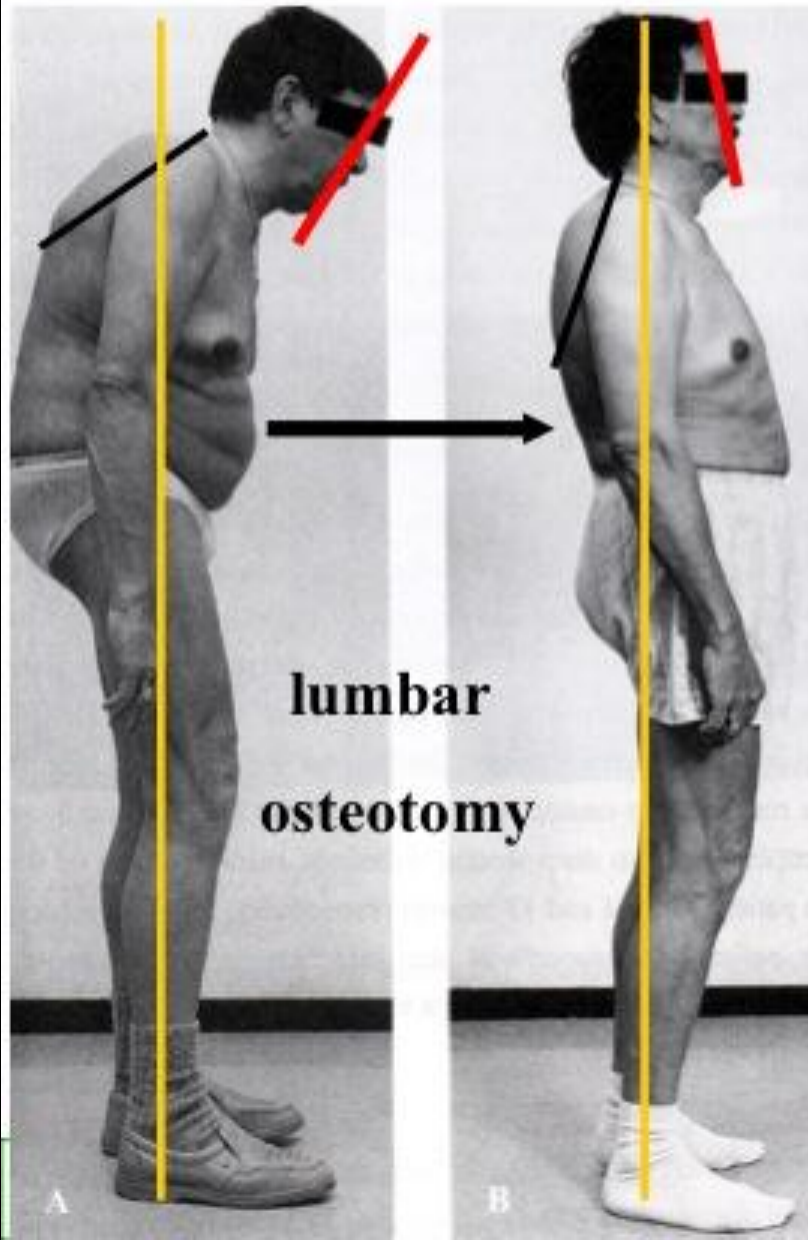


Lumbar osteotomies

- ~~open wedge~~
- Closing wedge (PSO)
- Poly-segmental



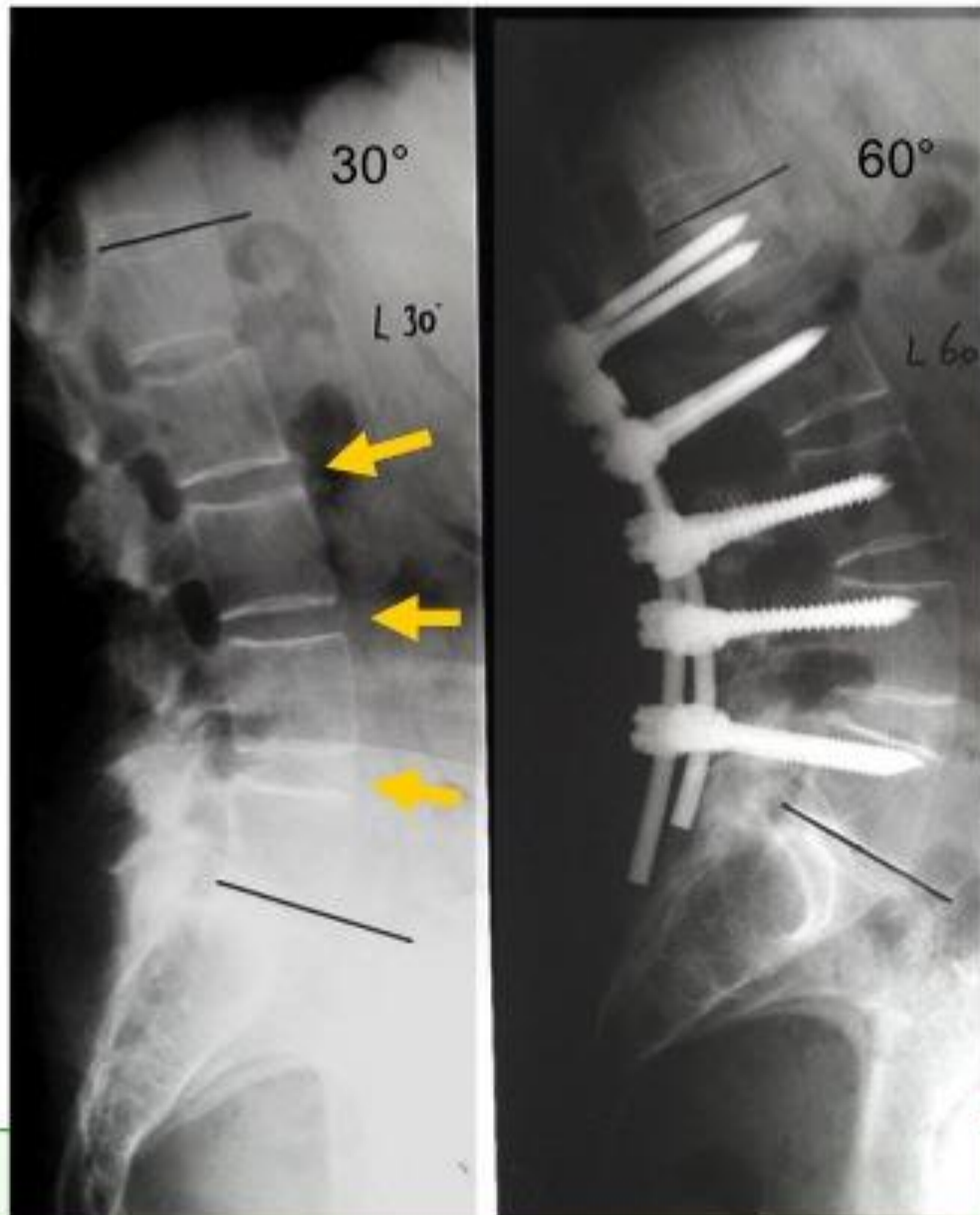
Closing wedge: 2000



Closing wedge: 2007



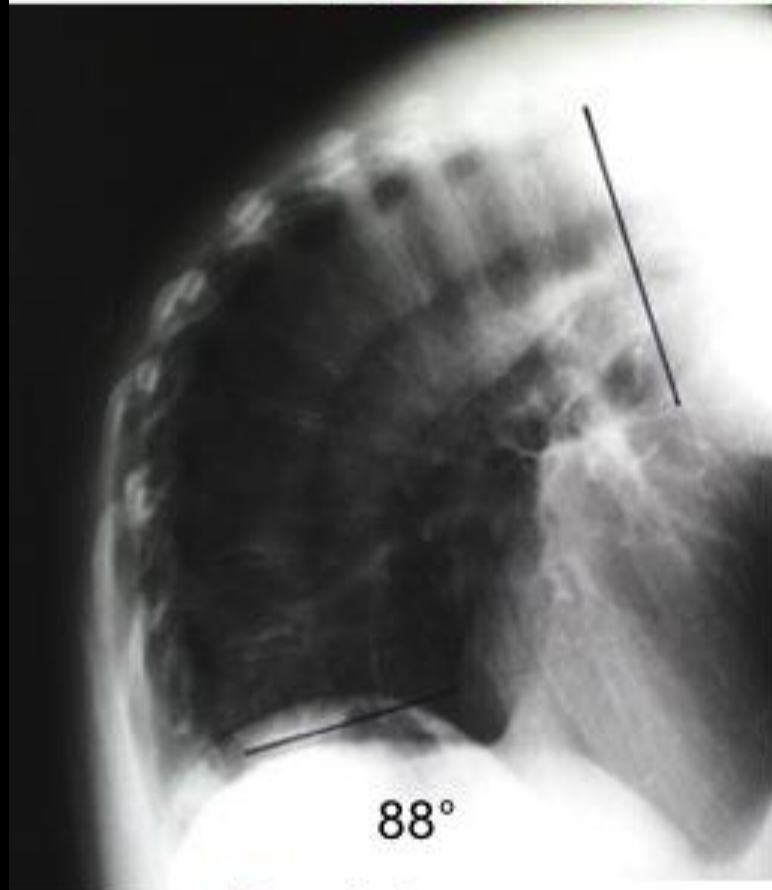
Poly-segmental osteotomy



- Open discs!
- Often female
- Early stage AS
- Correction:
5-7° per disc

Zielke,
van Royen
Eur Spine J. 1998

Thoracic osteotomies (rare)



- Anterior release (bony!)



- Posterior polysegmental osteotomy and instrumentation



Problems:

- Ribcage
- Pulmonary reserves
- Spinal cord (not cauda equina)

Complication surgery !!

SPINE Volume 30, Number 1, pp 101-107
©2004, Lippincott Williams & Wilkins, Inc.

■ Spinal Osteotomy in Patients With Ankylosing Spondylitis: Complications During First Postoperative Year

Karel F. Willems, MD,* Gerard H. Slot, MD,* Patricia G. Anderson, MA,†
Paul W. Pavlov, MD, PhD,* and Marinus de Kleuver, MD, PhD*

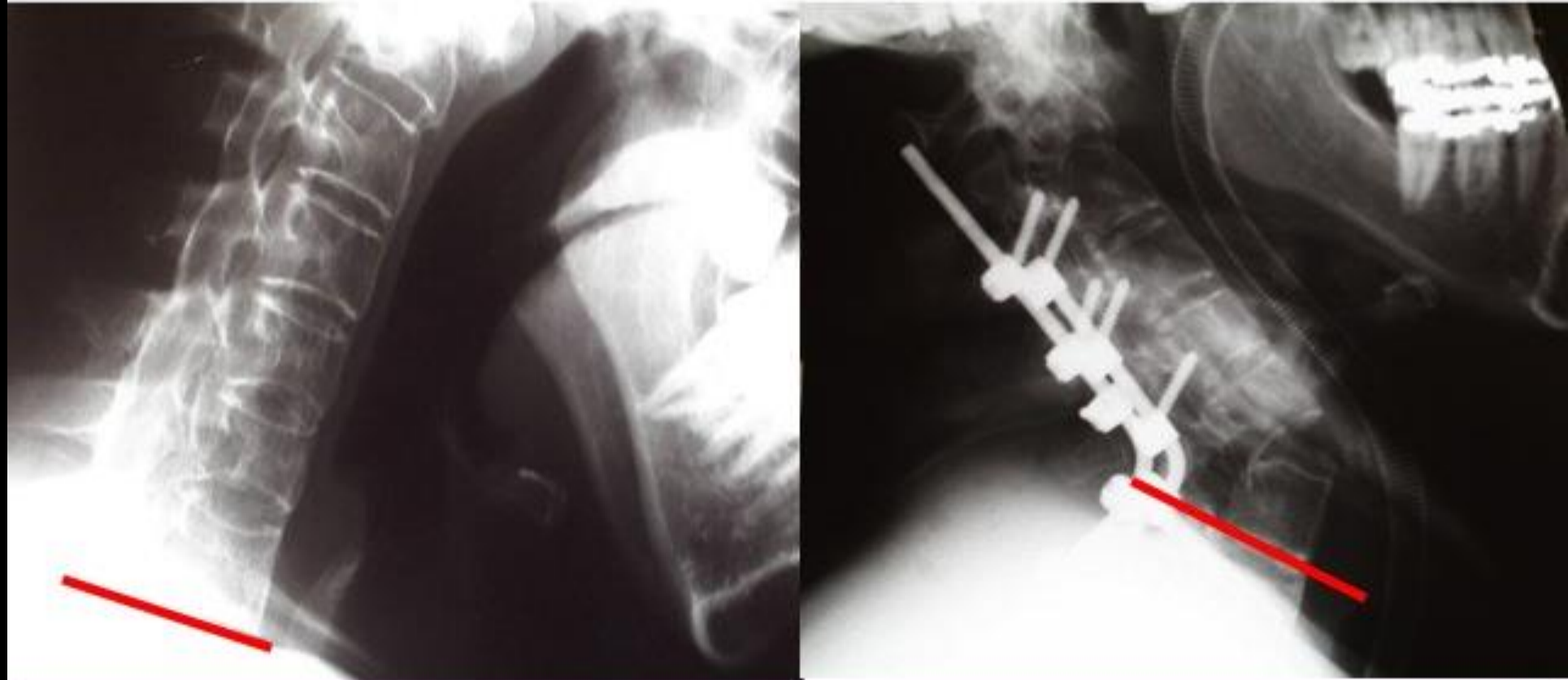
- N = 115 osteotomies
 - 7.8% neurologic deficit
 - 9.6% infections
 - 10.4% major general complications

Cervico-thoracic osteotomies



Danielle D. Langeloo
Henricus L. Jounnee
Paul W. Pavlov
Marinus de Kleuver

Cervical osteotomy in ankylosing spondylitis: evaluation of new developments





McMaster JBJS



Literature: sitting

- **Simmons**

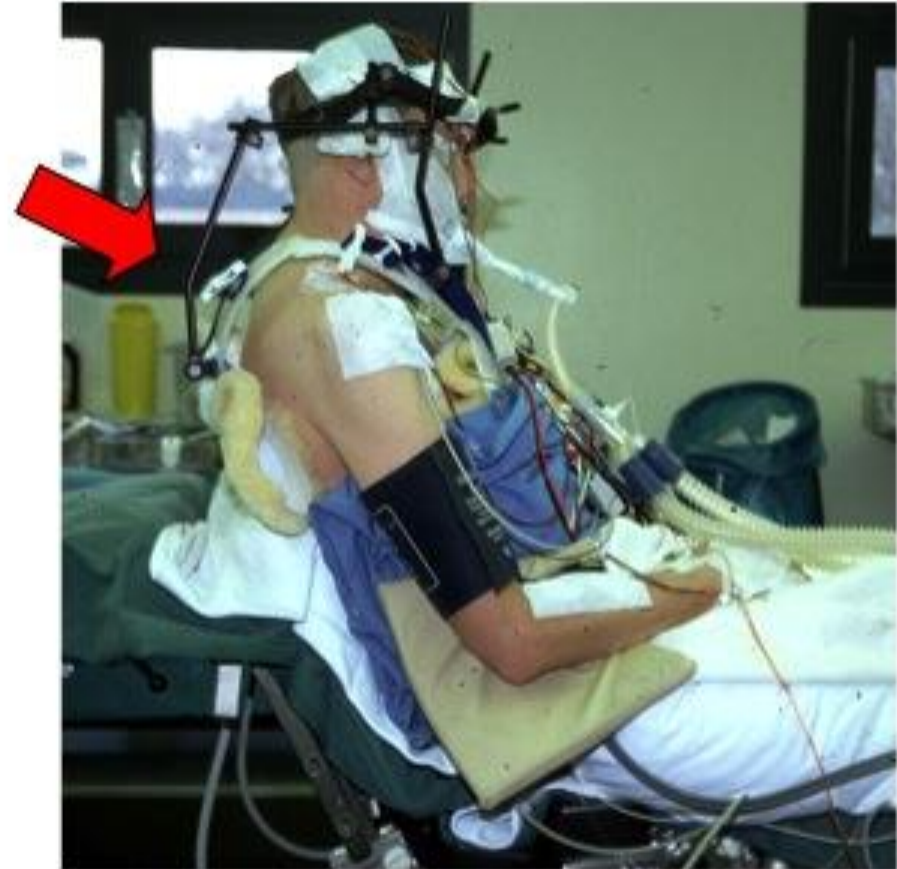
Spine 2006;31:3006-12

- N=131
- Sitting position with HALO
- Local anaesthesia
- No internal fixation

- **Belanger**

JBJS A 2005;87(8):1732-8

- N= 26
- Sitting position with HALO
- Local anaesthesia
- Majority with limited wiring techniques

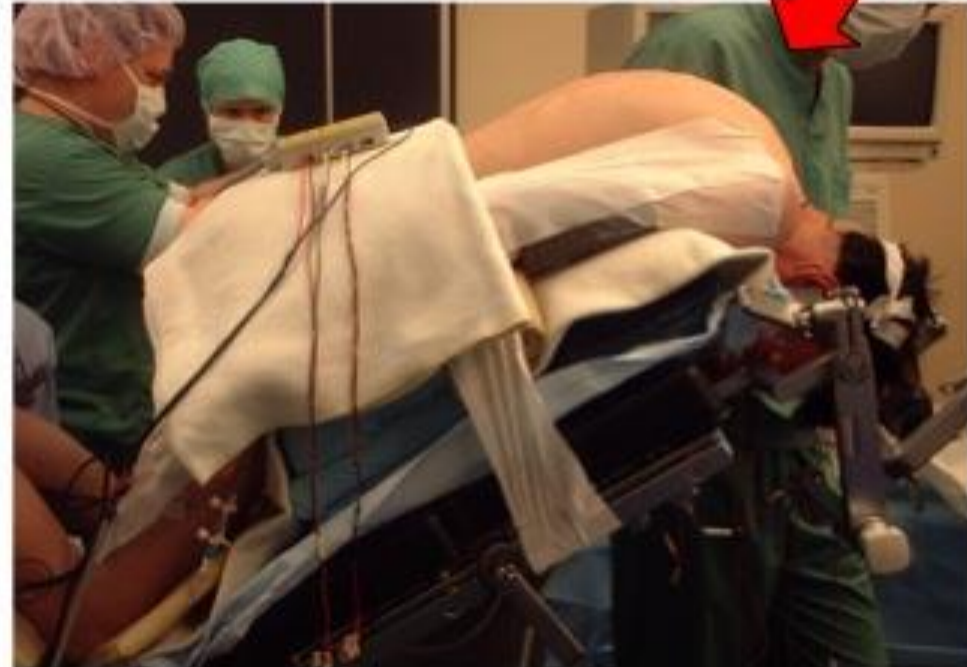


Literature: prone

McMaster

JBJS 1997;79-B:197-203

- N=15,
- Prone position,
- General anaesthesia & SSEP neuromonitoring
- Some with internal fixation



Literature: sitting

- **Simmons**

Spine 2006;31:3006-12

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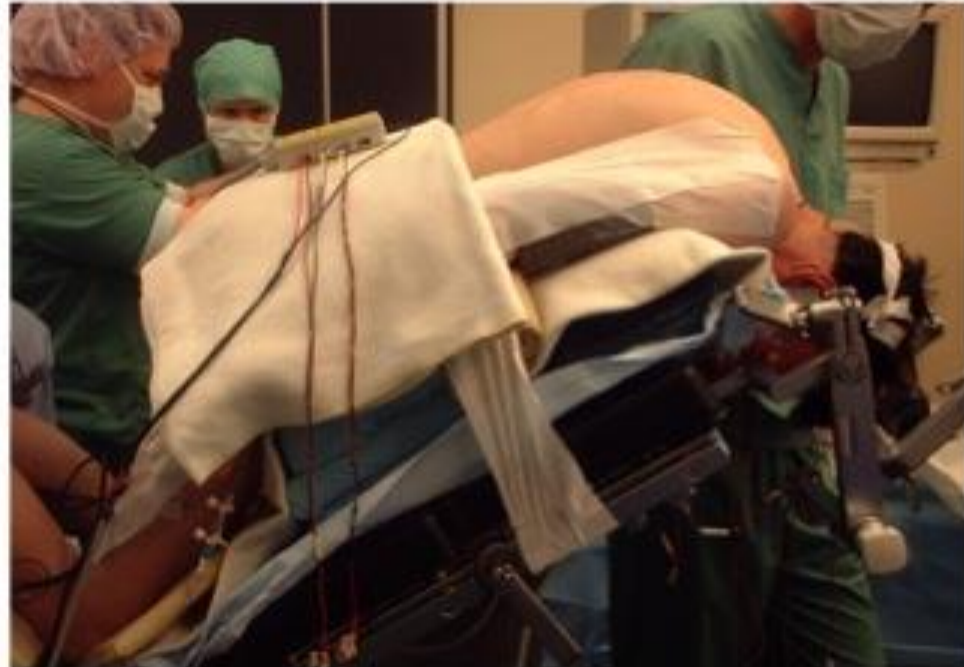


Literature: prone

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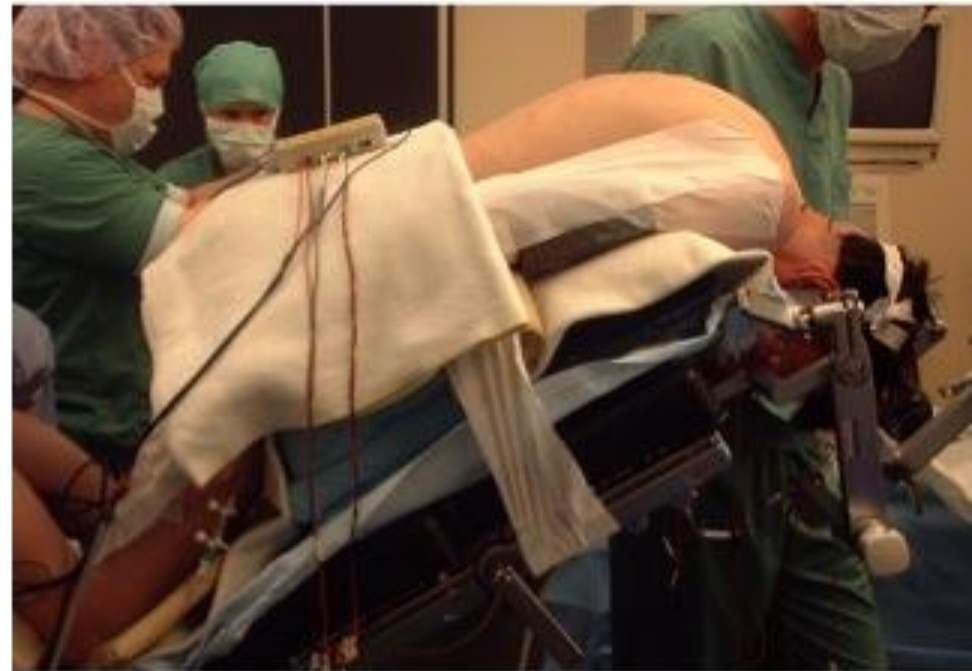
- N=15,
- Prone position,
- General anaesthesia & SSEP neuromonitoring
- Some with internal fixation



Our current method of choice I

Prone positioning

- Mayfield clamp
- no Halo cast/
vest



Our current method of choice II

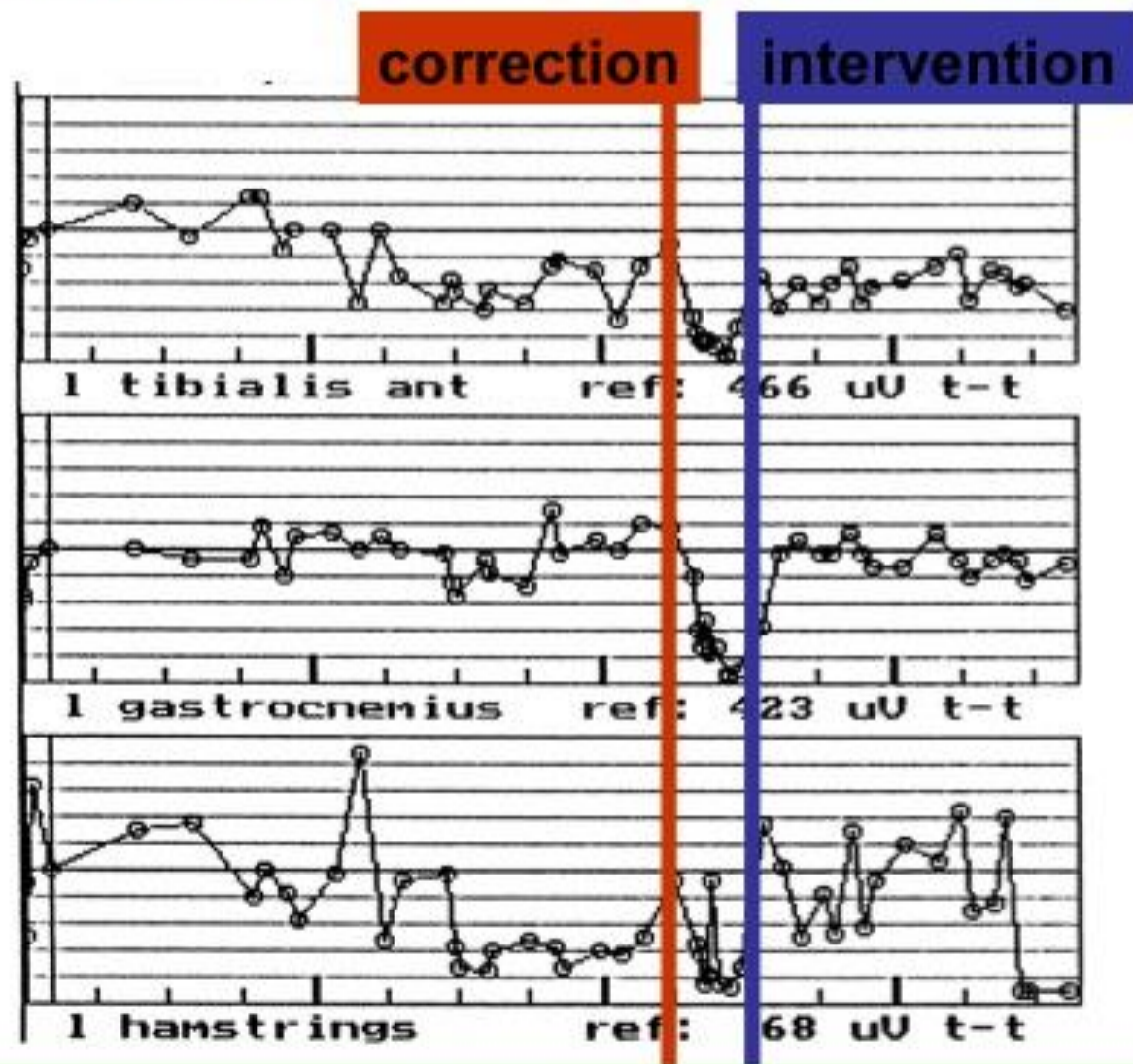
Internal fixation



Th pedicle screws
(laminotomy) to T4 - T6

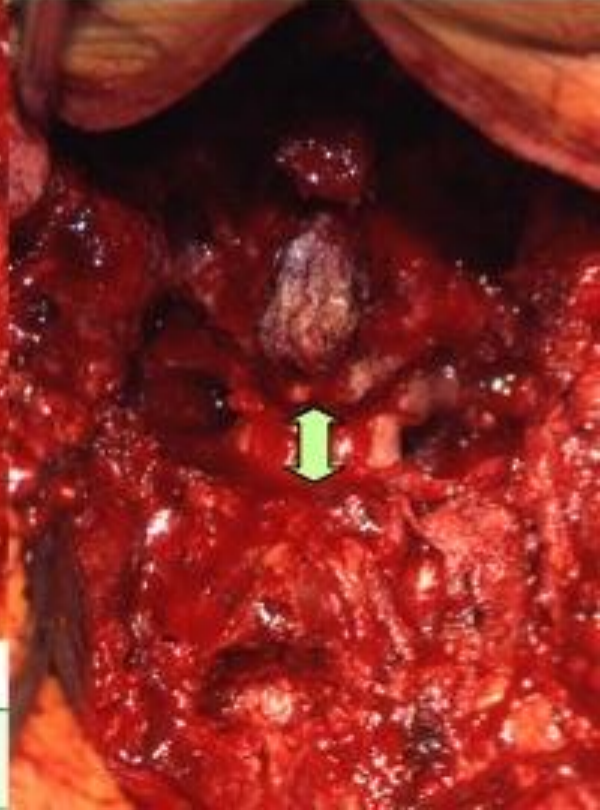
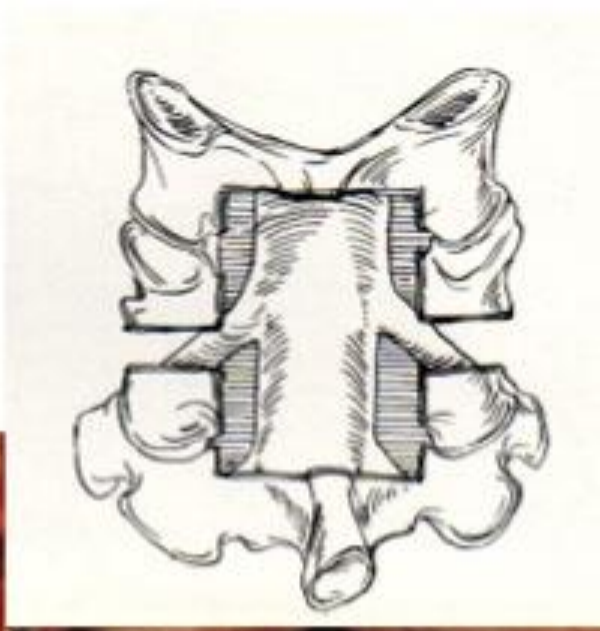
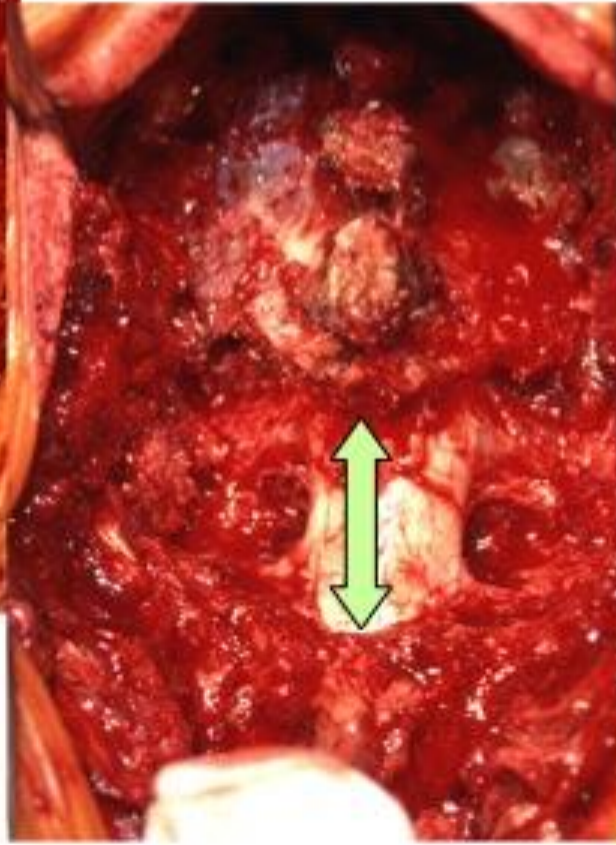
Our current method of choice III

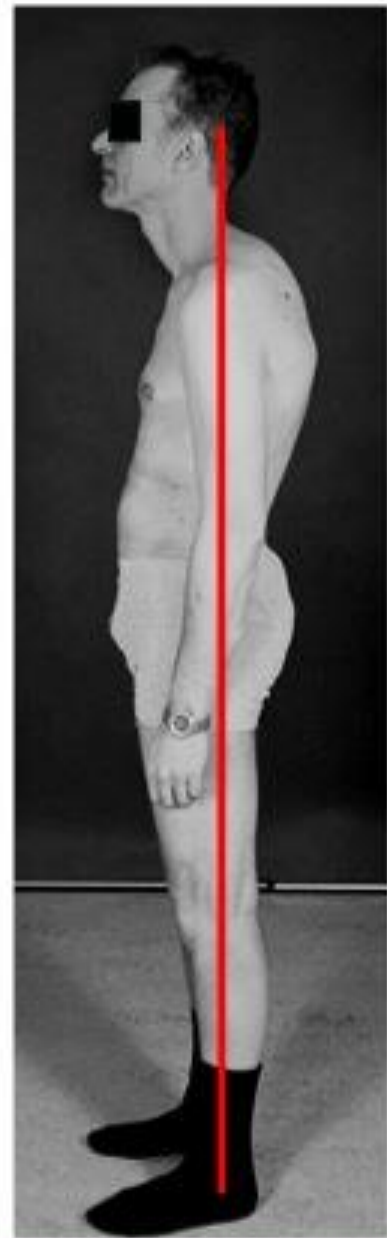
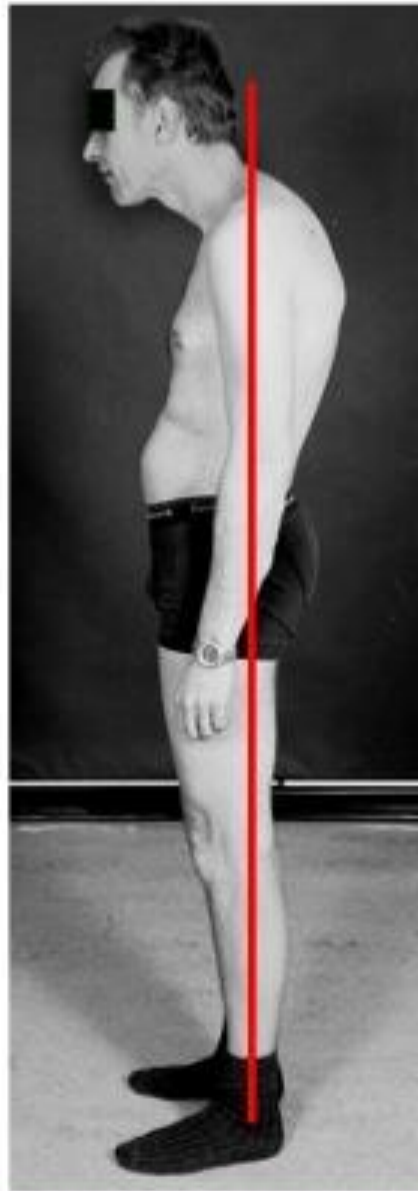
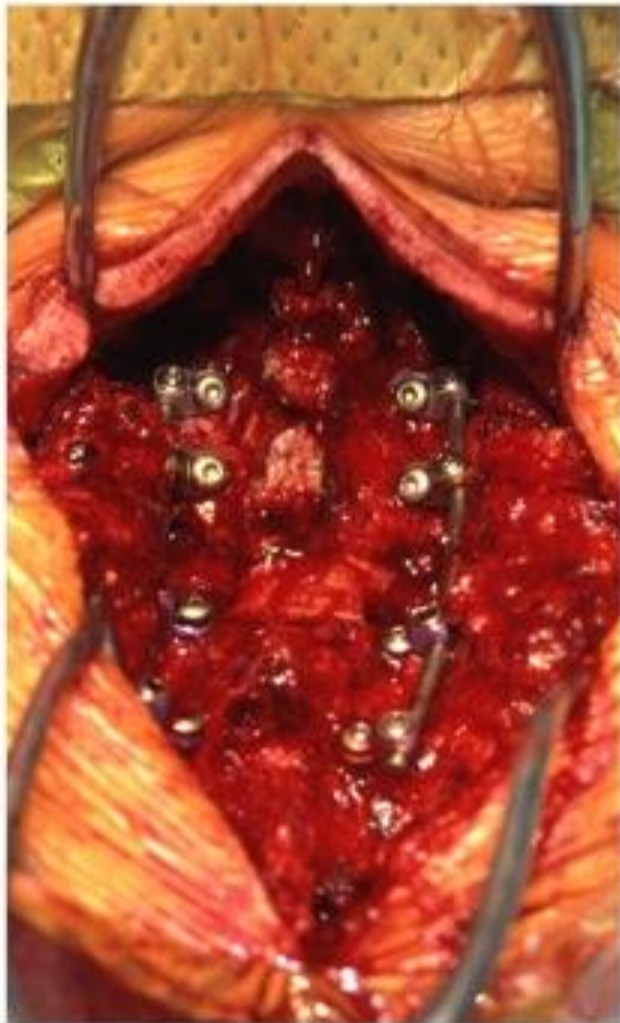
Spinal
Cord
Monitoring



time →

Sint Maartenskliniek





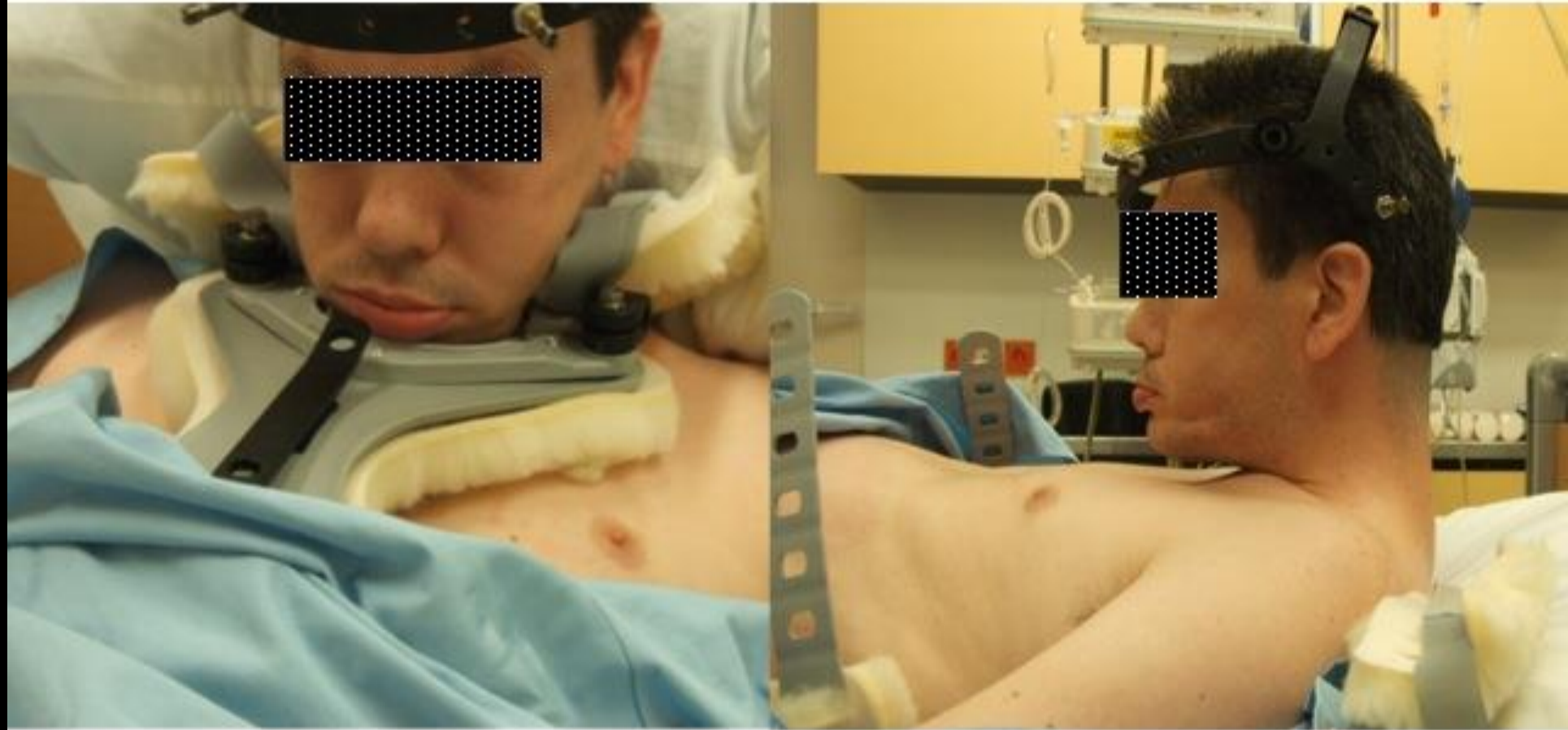
Extreme case

- 28 Y.O. male
- Ankylosing spondylitis
- Socially isolated
- Selfneglect
- I.V. drug abuse
- Methadon 40 mg/ day
- Smoking
- Poor teeth





Pre-operative halo



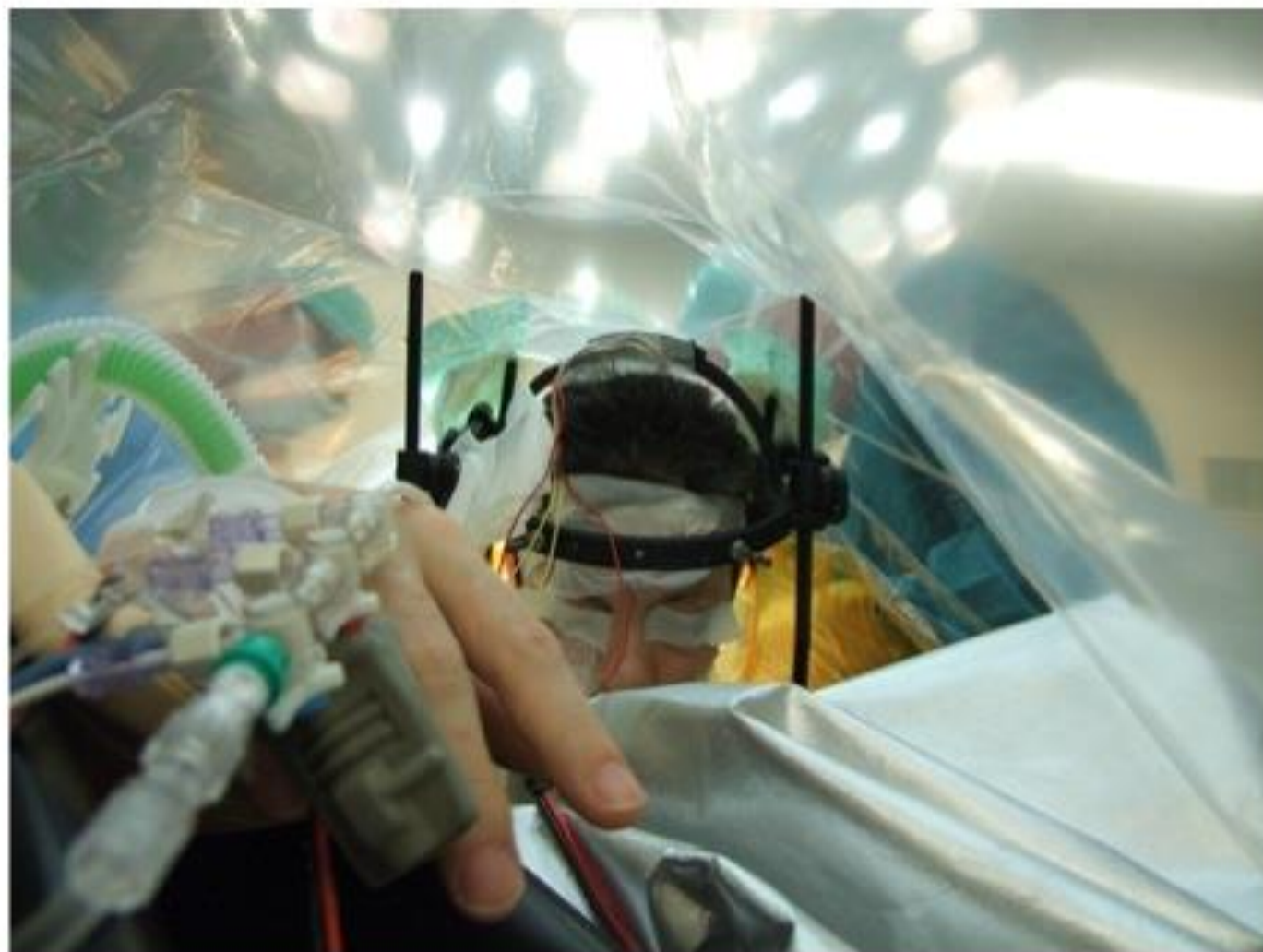
Fiberoptic intubation over guidewire

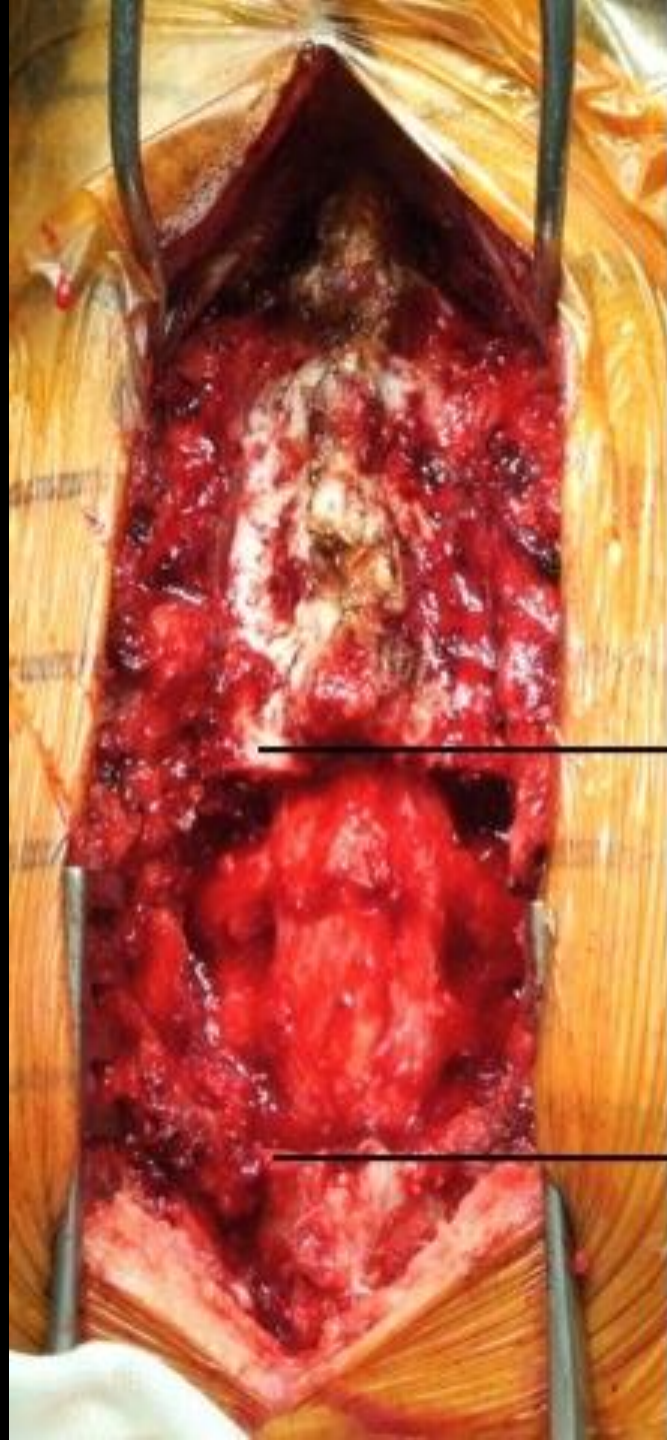


Operate in sitting position



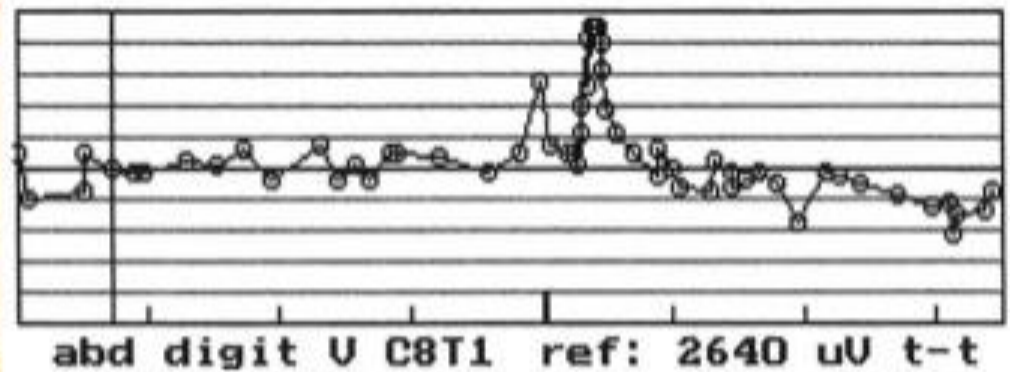
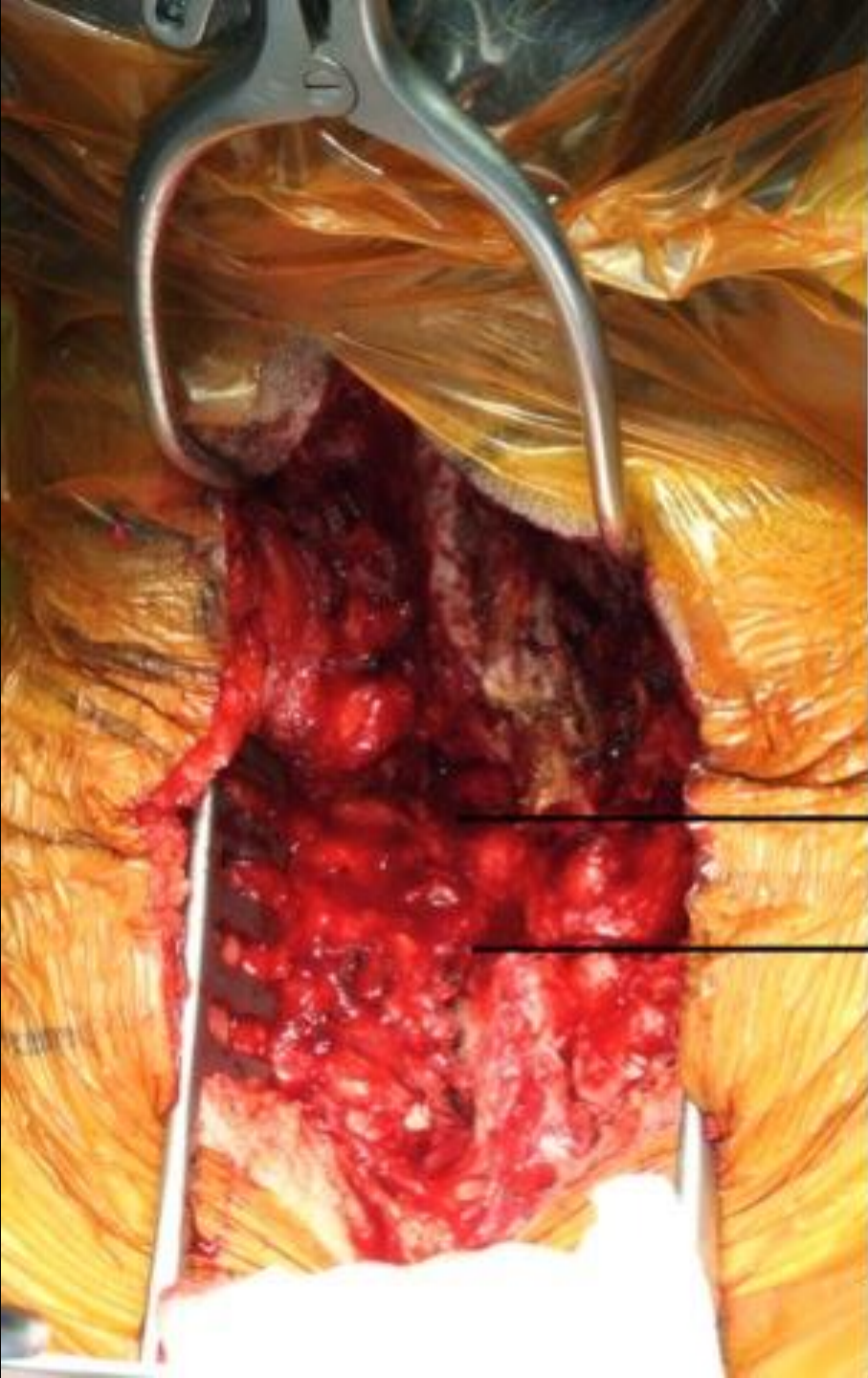
Transparent drapes





- Total laminectomy C7
- Partial laminectomy C6 and Th1
- Open foramina
- Resection of pedicles





Spinal cord
monitoring



Post-op 1



Post-op 2

Pre-op

Post-op 3



Conclusions I

- Inflammatory disease
- Rigid spine
- Progressive kyphosis, sometimes post-trauma
- Corrections through osteotomies
- Very good results possible
 - Lumbar closing wedge osteotomy
 - Lumbar poly-segmental osteotomies
 - Cervical osteotomy

Conclusions II

- Operations are complication prone due to:
 - Comorbidity, osteoporosis, spinal cord
 - Complications can occur late
- Cervical and larger lumbar correction:
 - More difficult
 - More complications

Recommendations I

- Don't delay surgery too long
- Carefull patient selection
- Use experienced team
 - Excellent anaesthesia
 - Operate prone
 - Neuromonitoring
 - Motor evoked potentials
 - Extensive instrumentation
 - Quick mobilisation

Recommendations II

- Cervical osteotomies
 - Operate prone
 - Spinal cord monitoring
 - Extensive instrumentation

- Sitting position **ONLY** in extreme cases