

Surgery in LBP

Orthopaedic perspectives

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Disclosure

- This presentation is aiming for academic benefits of GPs and juniors
- No commercial bias nor taking benefits from sponsor company

Learning outcome

- To know the surgical conditions of LBP problems
- To learn when and how to decide surgery
- To learn how patients getting benefits from surgery
- To understand surgical related complications
- To take care of surgical ethics in decision making and after care with patient counseling

Low Back Pain

- **Causes more disability worldwide than any other condition**



NICE Guidelines Nov 2016



Acute back pain

Acute neck pain

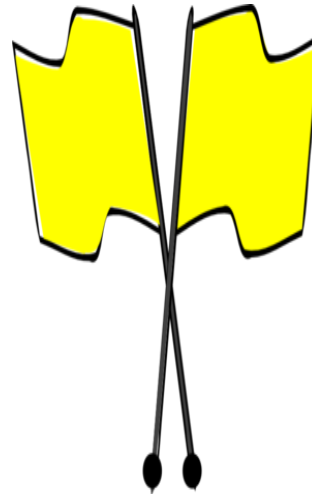
- 25% of the population at any one time
- *10 – 40% can become persistent and disabling*
- *8 - 15% may be able to find a patho anatomical cause*
- *10 – 15% may have a neurological sign*
- *1 – 2% may be serious*

Danger Signs in LBP

- Biomedical model
 - Red flags



- Bio-psycho-social model
 - Yellow flags



- Socio-psycho-biological model

Red Flags from history— may need surgery



- Fracture, infection or tumour, neurological deficit
- Major trauma
- Minor trauma in elderly or osteoporosis
- Age
 - <10 > 50
- History of Ca
- Systemic illness
 - Fever, wt. loss, TB
- IVDU
- Immunosuppression
- Progressive sensory loss
- Bladder or bowel dysfunction

Red flags from examination

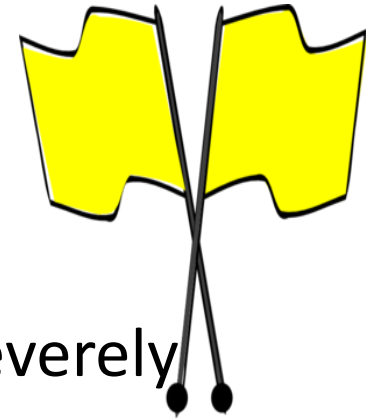
- **Neuro deficit**
 - Legs or perineum (saddle anaesthesia)
 - Arms (progressive weakness in fine movement)
- **Abdomen - AAA --severe pain**
- **Progressive deformities with lack of loading balance --- unable to sit , stand , walk , line down on bed (Disability in ADL)**

Table 2. Red Flags for Serious Etiologies of Acute Low Back Pain

Possible etiology	History findings	Physical examination findings
Cancer	Strong: Cancer metastatic to bone Unexplained weight loss Weak: Cancer, pain increased or unrelieved by rest	Weak: Vertebral tenderness, limited spine range of motion
Cauda equina syndrome	Strong: Bladder or bowel incontinence, urinary retention, progressive motor or sensory loss	Strong: Major motor weakness or sensory deficit, loss of anal sphincter tone, saddle anesthesia Weak: Limited spine range of motion
Fracture	Strong: Significant trauma related to age* Intermediate: Prolonged use of steroids Weak: Age older than 70 years, history of osteoporosis	Weak: Vertebral tenderness, limited spine range of motion
Infection	Strong: Severe pain and lumbar spine surgery within the past year Intermediate: Intravenous drug use, immunosuppression, severe pain and distant lumbar spine surgery Weak: Pain increased or unrelieved by rest	Strong: Fever, urinary tract infection, wound in spine region Weak: Vertebral tenderness, limited spine range of motion

Yellow Flags

Bio psycho social model



- The belief that pain is harmful or severely disabling
- Fear-avoidance behaviour (avoiding activity because of fear of pain)
- Low mood and social withdrawal
- Expectation that passive treatment rather than active participation will help.

Imaging

- **Explain why not**
- **Explain what else**
- High prevalence of Abnormal findings on CT scans/MRIs – *sensitivity & Specificity*
- Disc degeneration 91%
- Disc bulges 56%
- Disc protrusion 32%
- Annular tears 38%

Diagnostic imaging

- Symptom specific level
- Neural specific level
- Plain X ray , Stress film
- Measuring mechanical axis ,alignment ,soft tissue shadow
- CT , MRI , PET , Bone Scan with contrast
- DEXA scanning

treatment and welcome an opportunity to care physicians.

PAIN TREATMENT LADDER*



* Based on the interventional pain management experience of Dr. John Stamatos.

Medtronic Pain Therapies may

Judgment on treatment decision

Interpretation and interrelation of following facts

!--

- Patient 's chronological sequence of symptoms and duration
- Disability grading and patient' expectation
- Consistent physical signs
- Consistent imaging factors
- Patients' physiology and socio psychology
- Technical and facility based care

When to consider surgery ?

- Unstable mechanics --# dislocations
- Loading and activity related pain—poor ADL
- Progressive neurological symptoms consistent with clinical and radiological findings
- Progressive deformity in growing spine
- Potential problem with spinal balance due to deformity
- Destruction with loss of structure column
- Malignancy which need stability and pain control

Fundamental principles in surgery

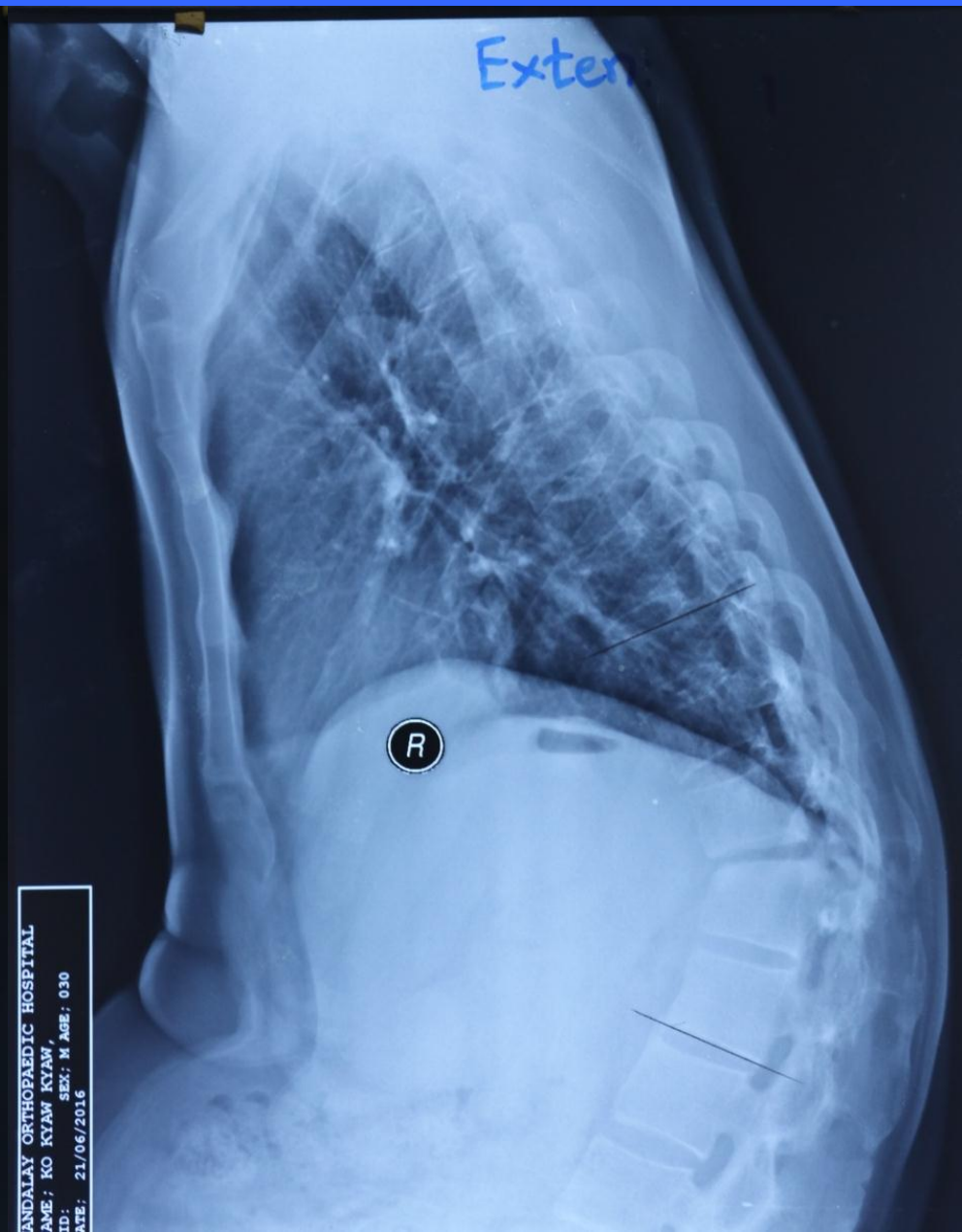
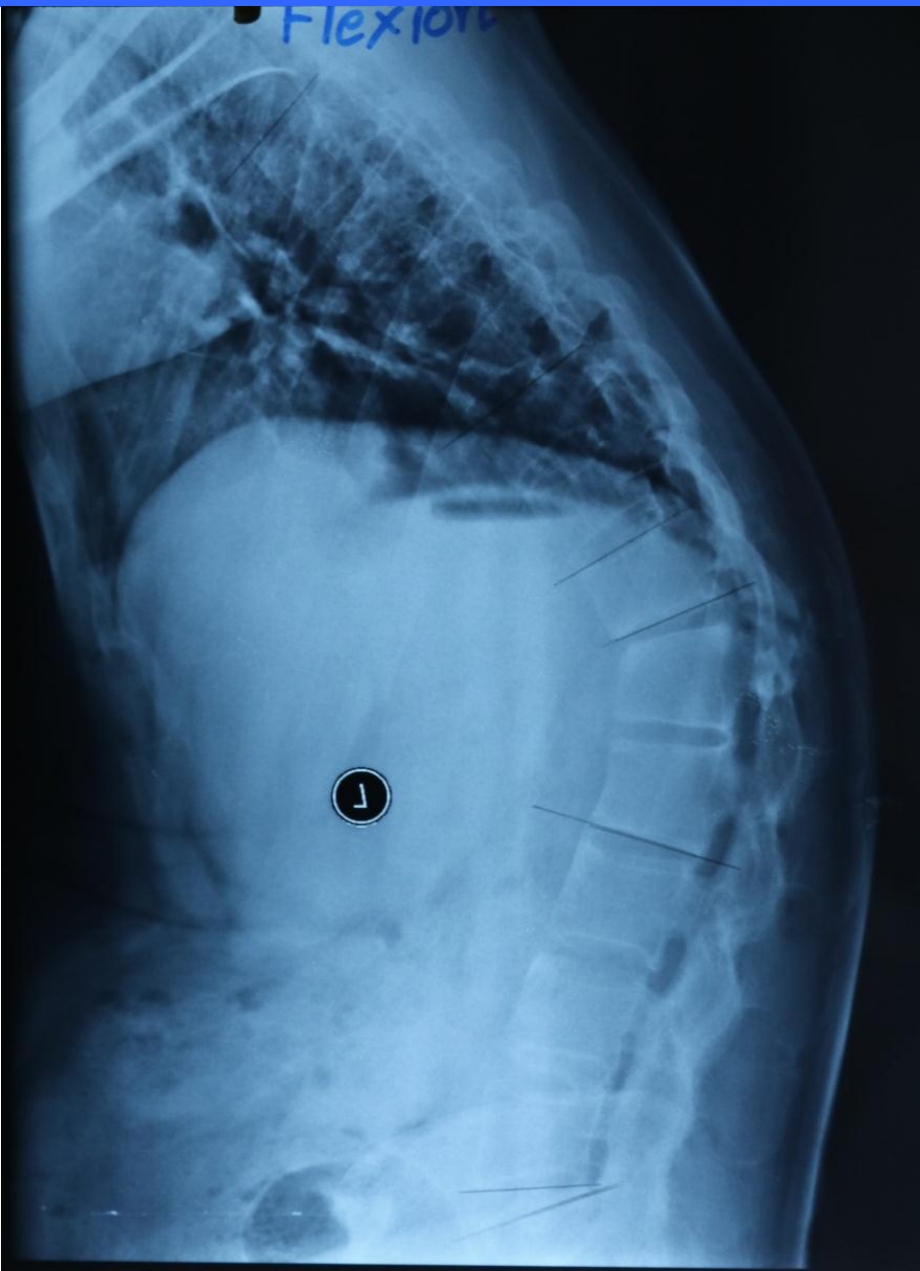
- Preserve back muscle integrity
- Preserve motion segment –non fusion technology
- Restore physiological balance—contour alignment correction
- Preserve neuro-biology (neuro safety)
- Reduce post surgical pain –MISS /computer assisted surgery
- ***Patient safety—the most respectful***

Common questions in surgery

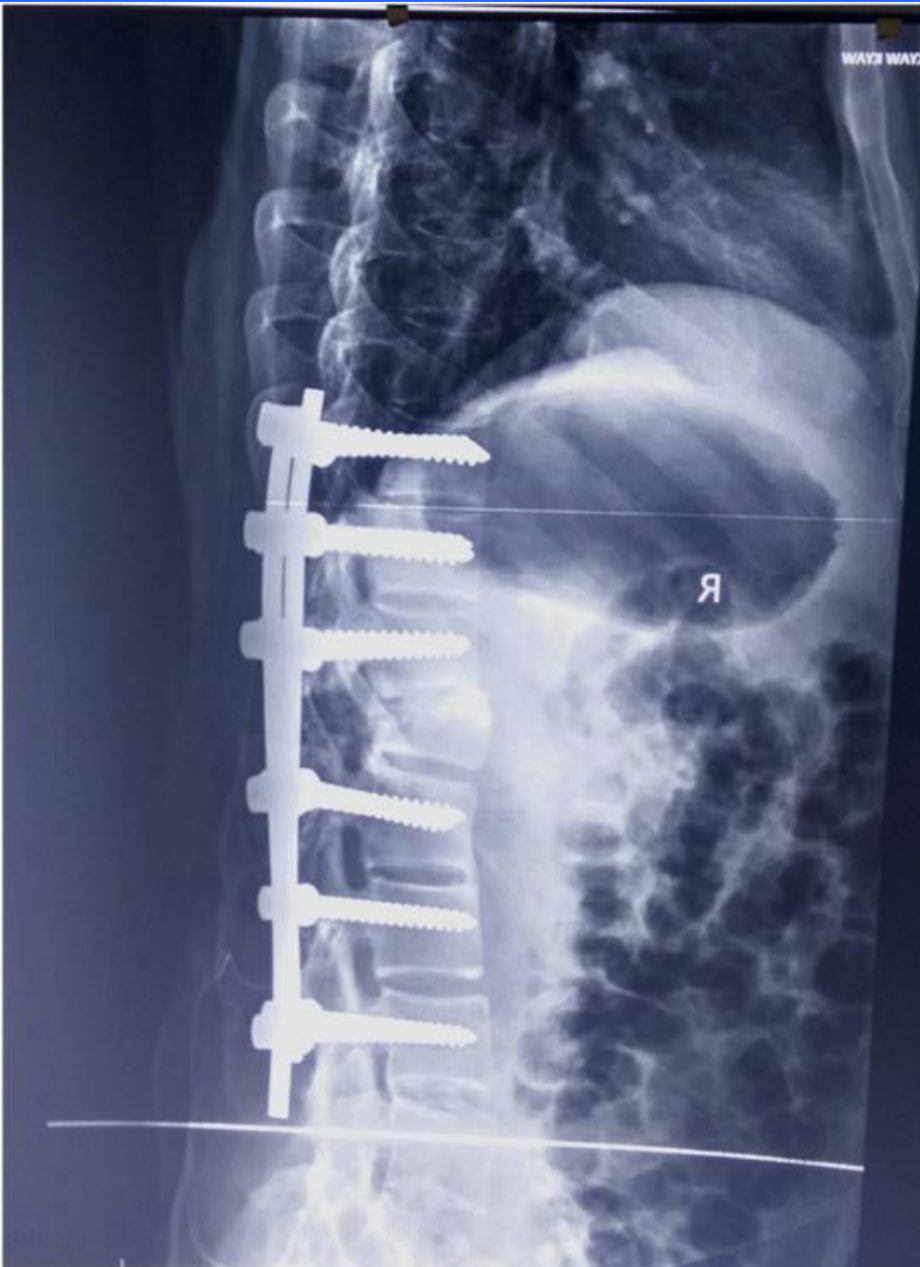
- Adequate treatment before surgery ?
- Is there any urgency ?
- Is there any high potential recovery ?
- Is this feasible and safe ?
- Is this one step or stage surgery ?
- What is most realistic expectation ?
- Can this be meet with expectation?

Types of surgery

- Anterior or Posterior or combined
- With or without decompression
- With or without instrumentation
- Fusion or not
- Level of fusion
- Open or MIS



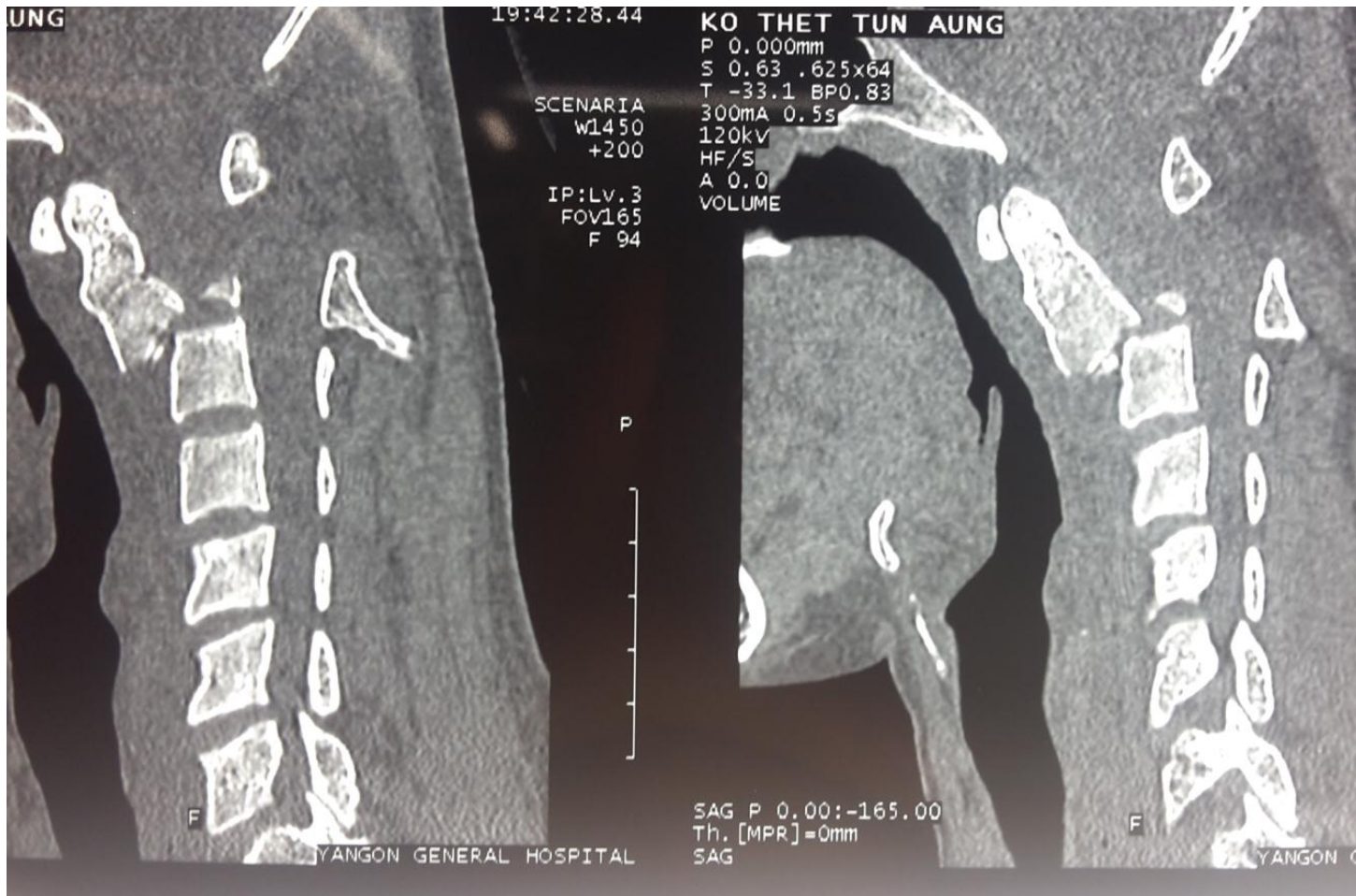
MANDALAY ORTHOPAEDIC HOSPITAL
NAME: KO KYAW KYAW,
ID: SEX: M AGE: 030
DATE: 21/06/2016



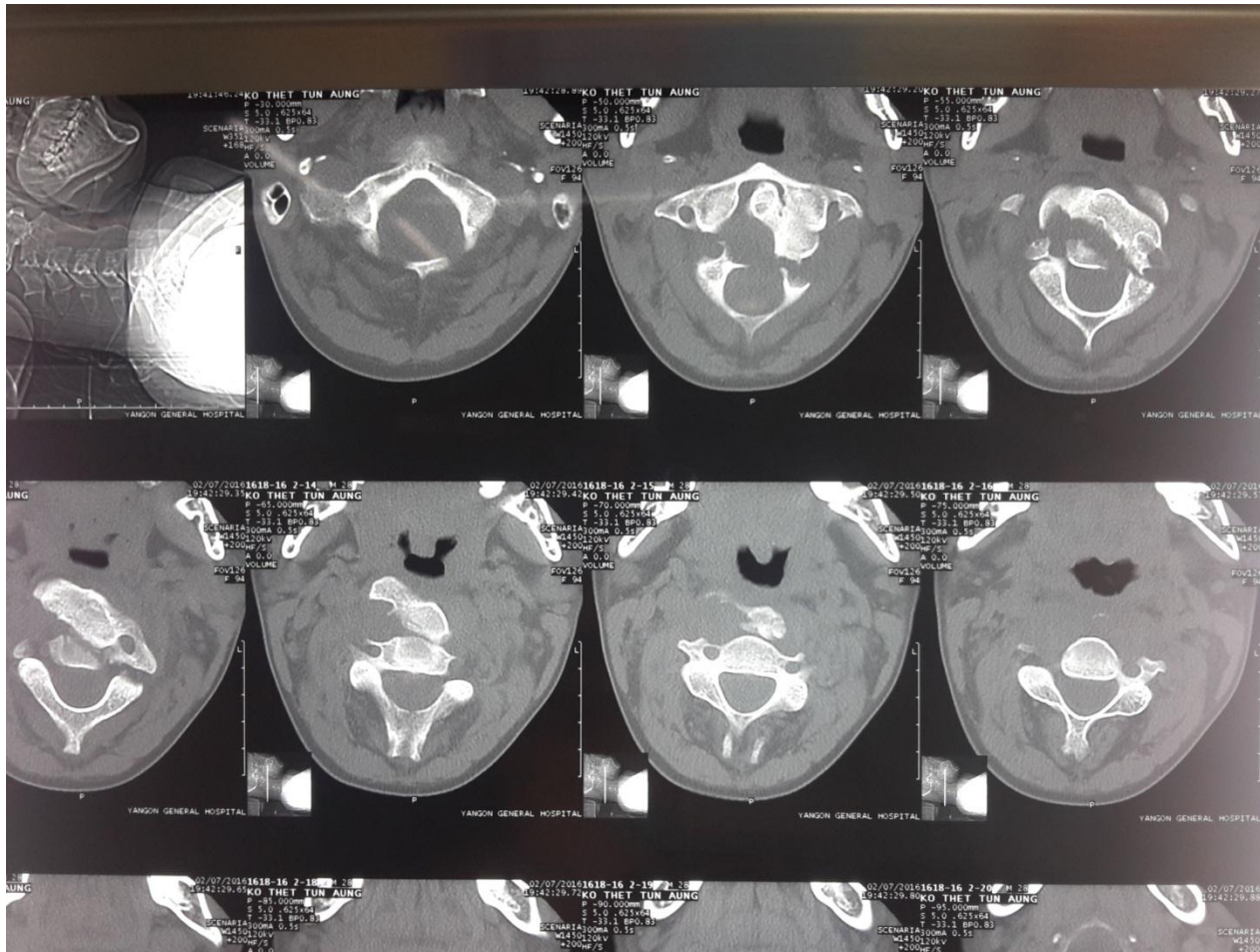
28yrs M fall from motorcycle



HANGMAN FRACTURE type?



Diagnosis?



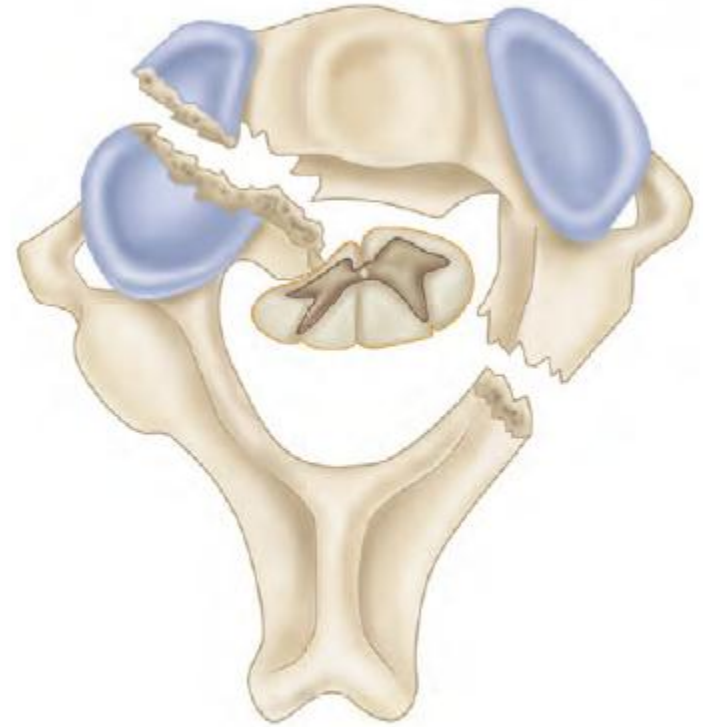
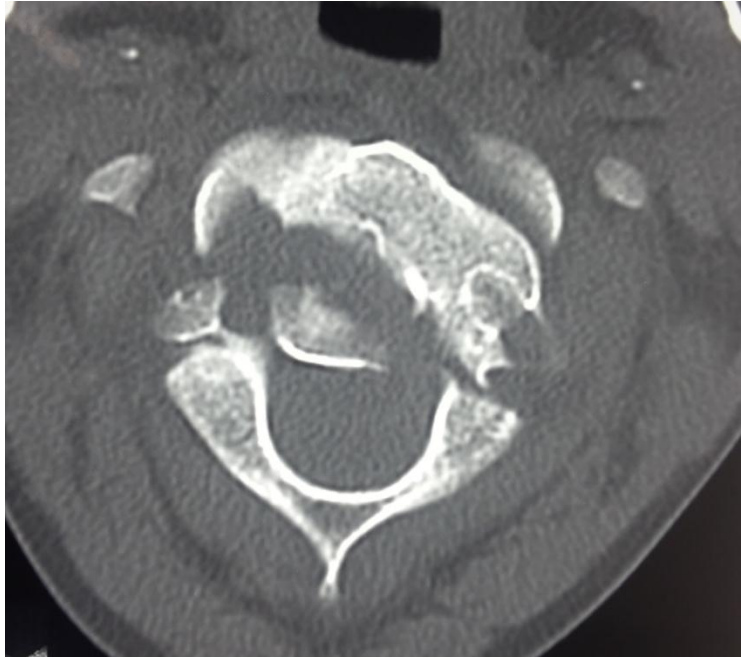
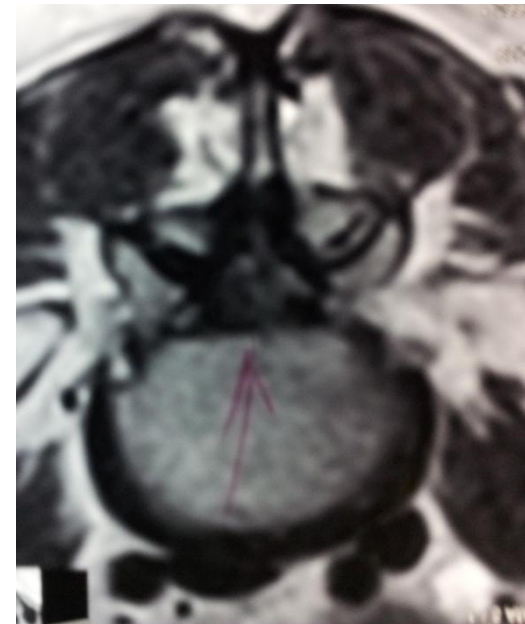
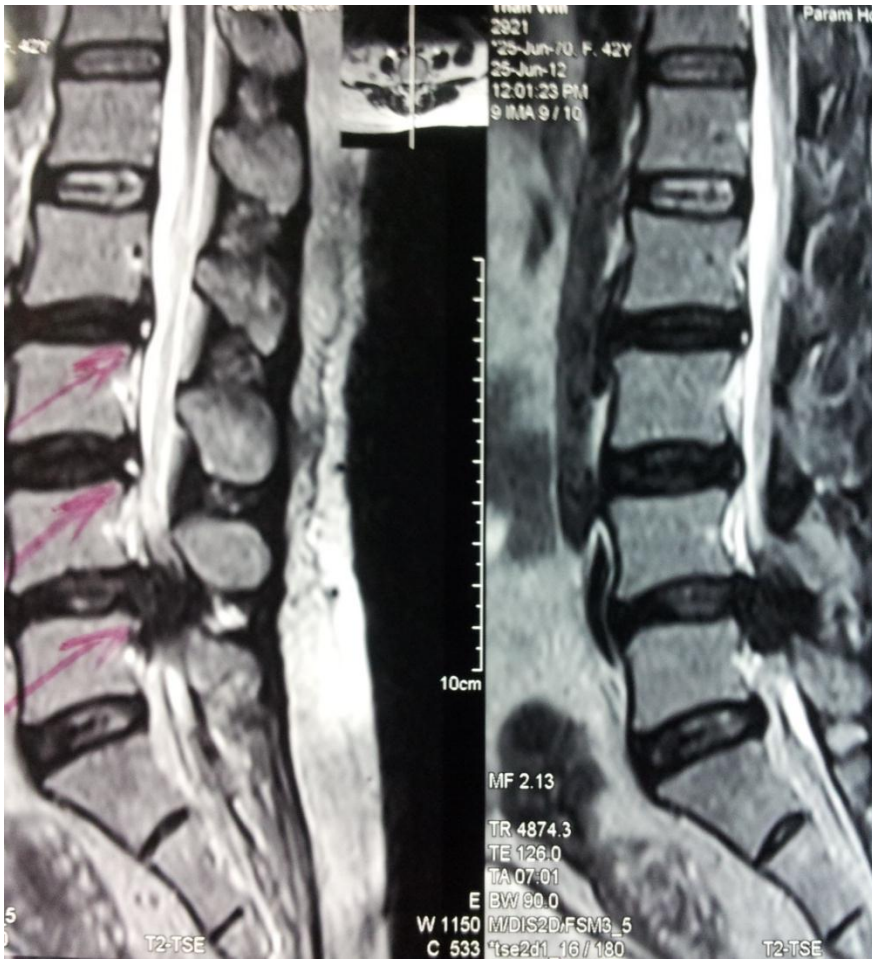


FIGURE 38-23 Atypical hangman fracture with cord impingement described by Starr and Eismont.

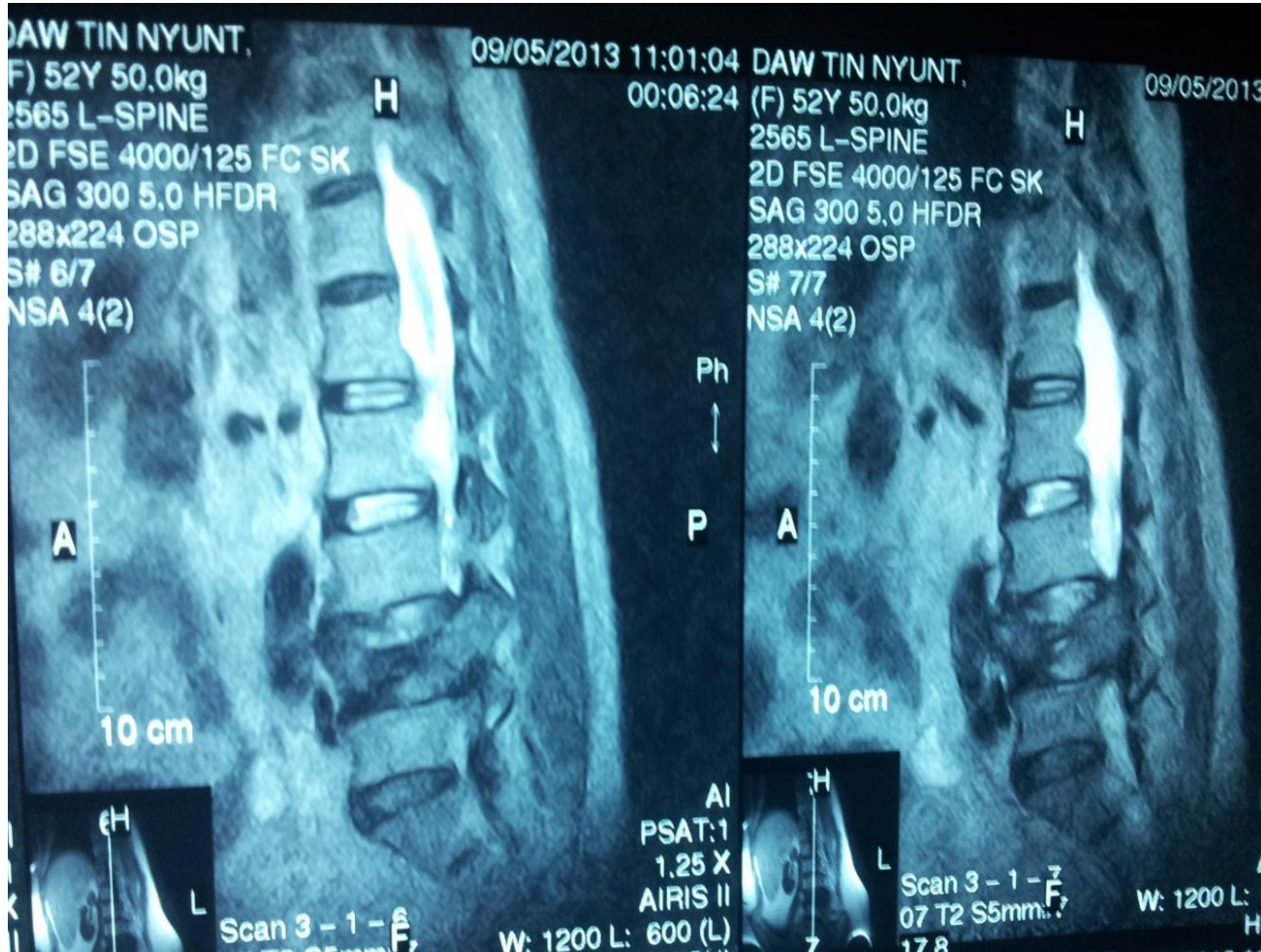




ACES



Metastasis to L4



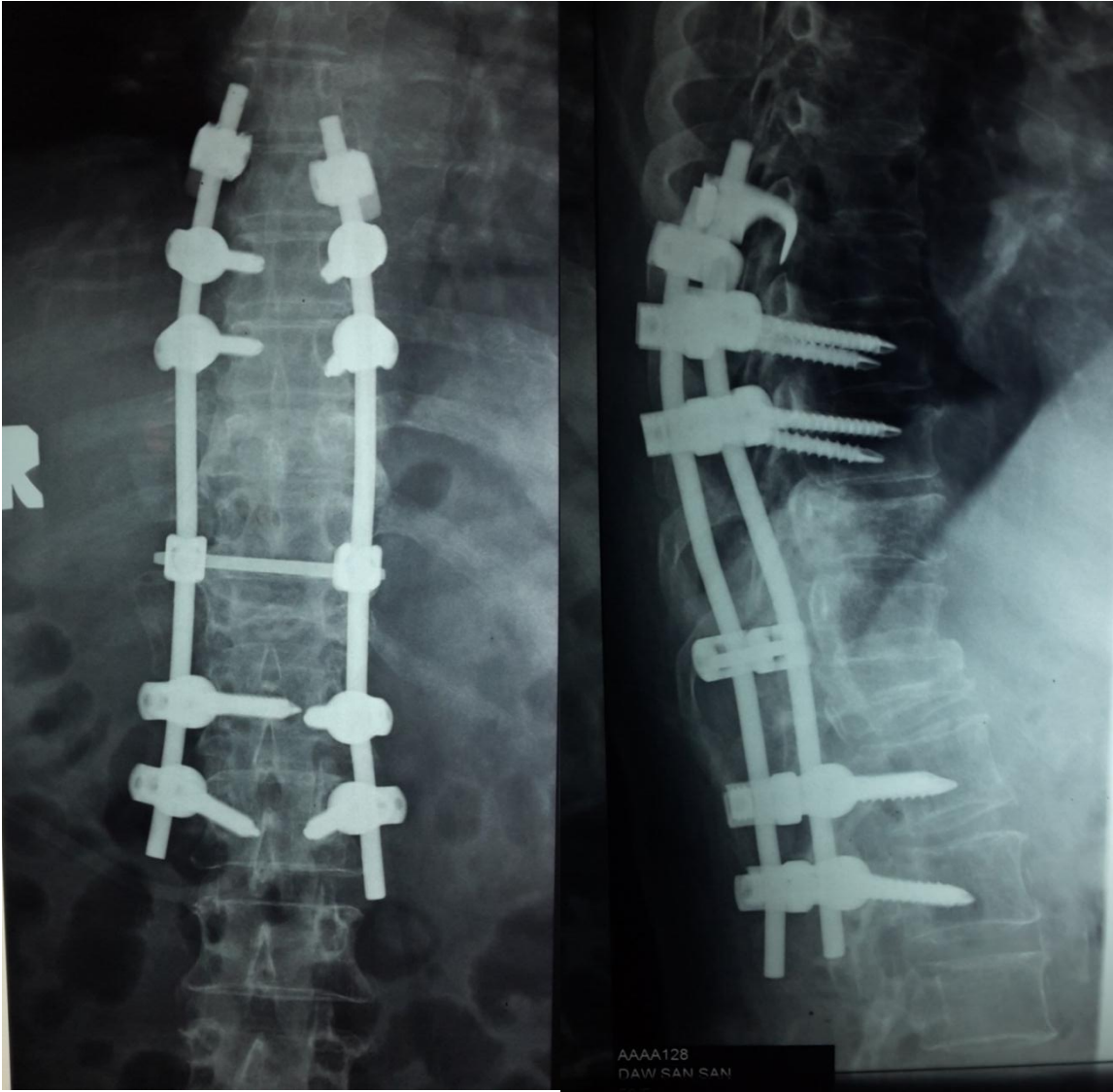
Initial on level progress to adjacent
CVF within 3 months



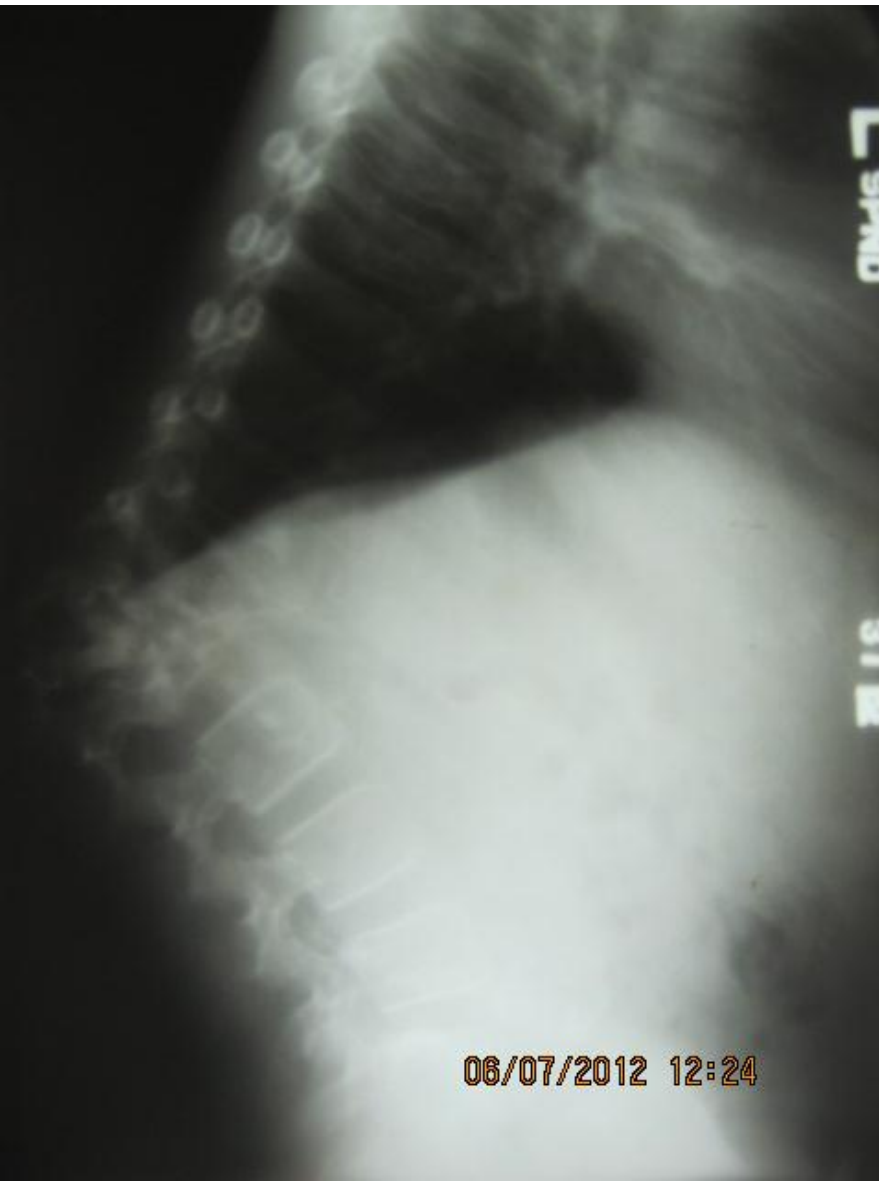
Progressive kyphosis cause neural compromise



Long posterior fixation







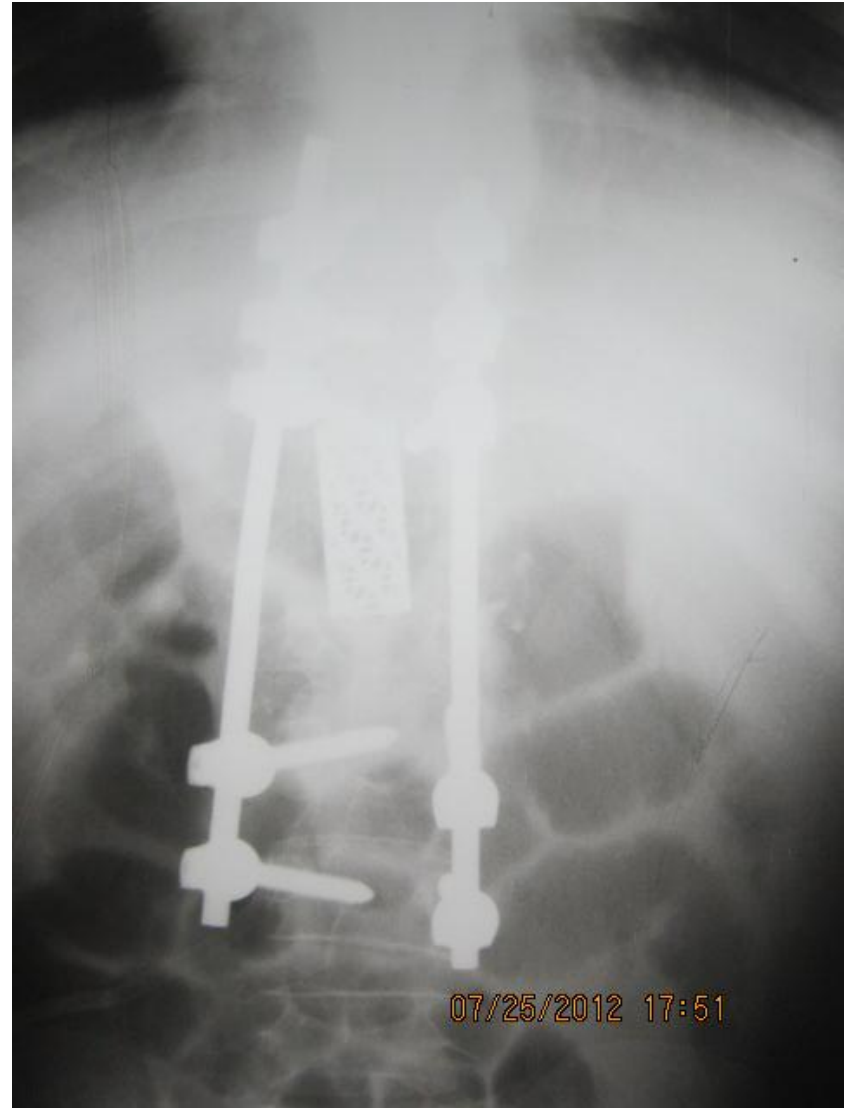
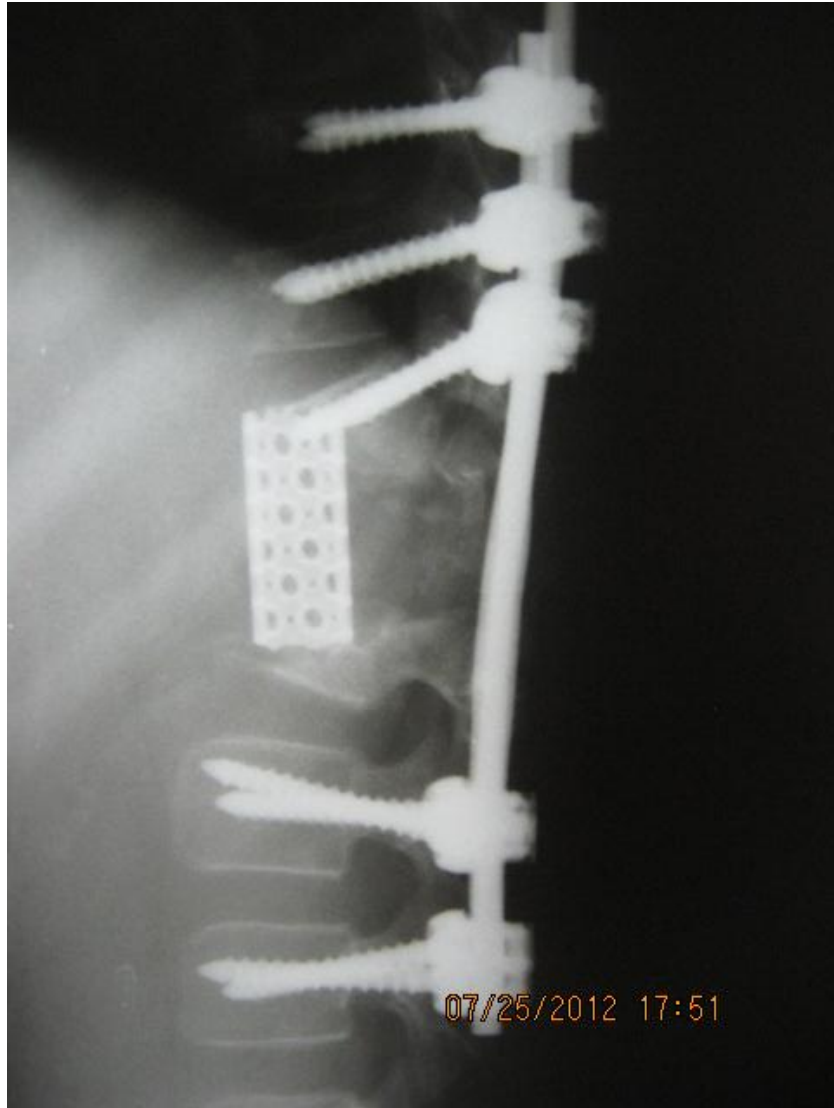
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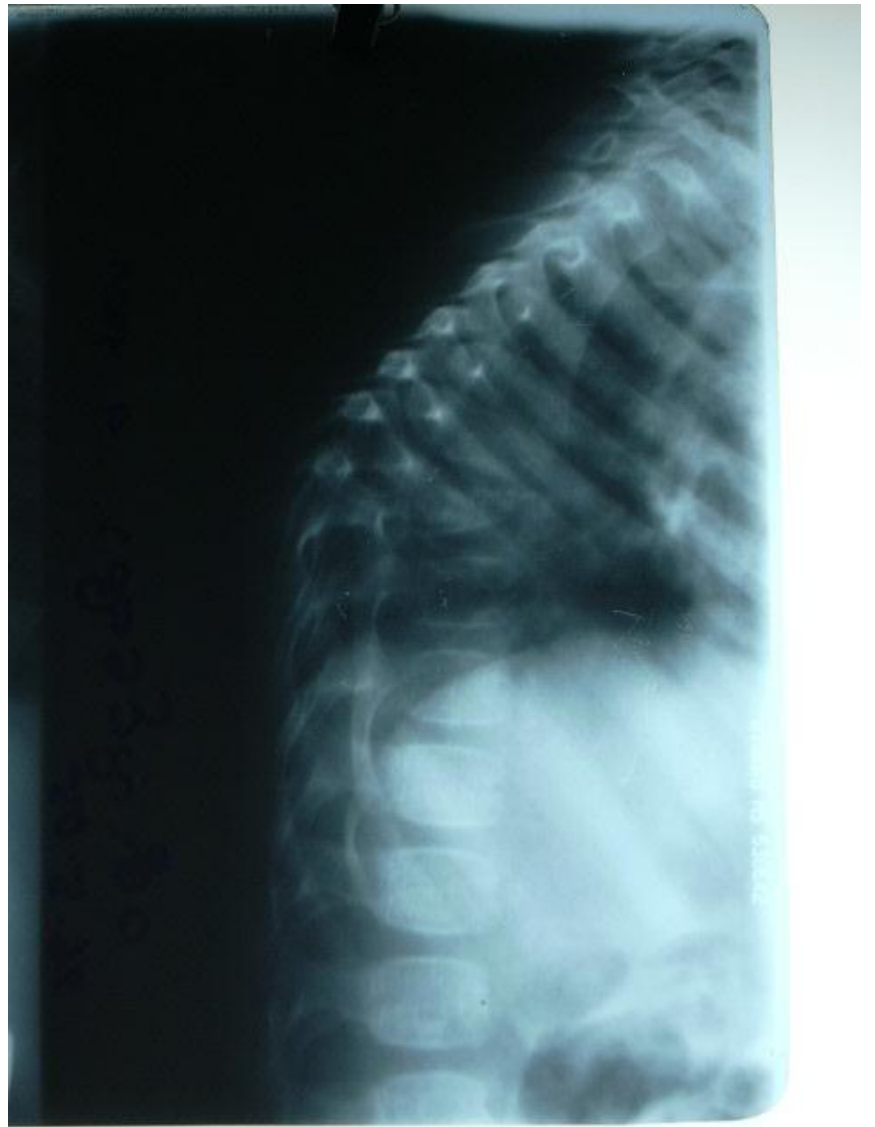


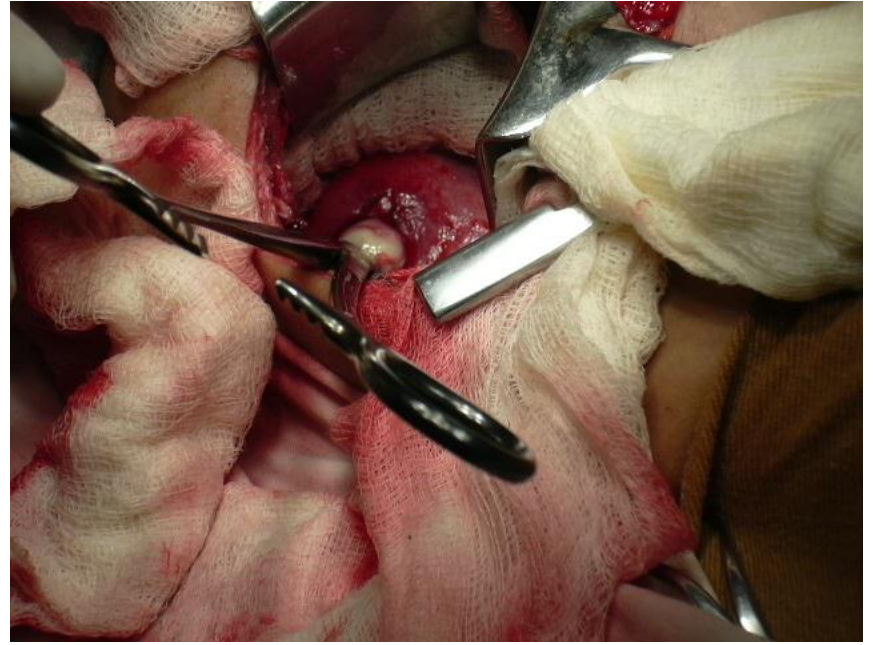
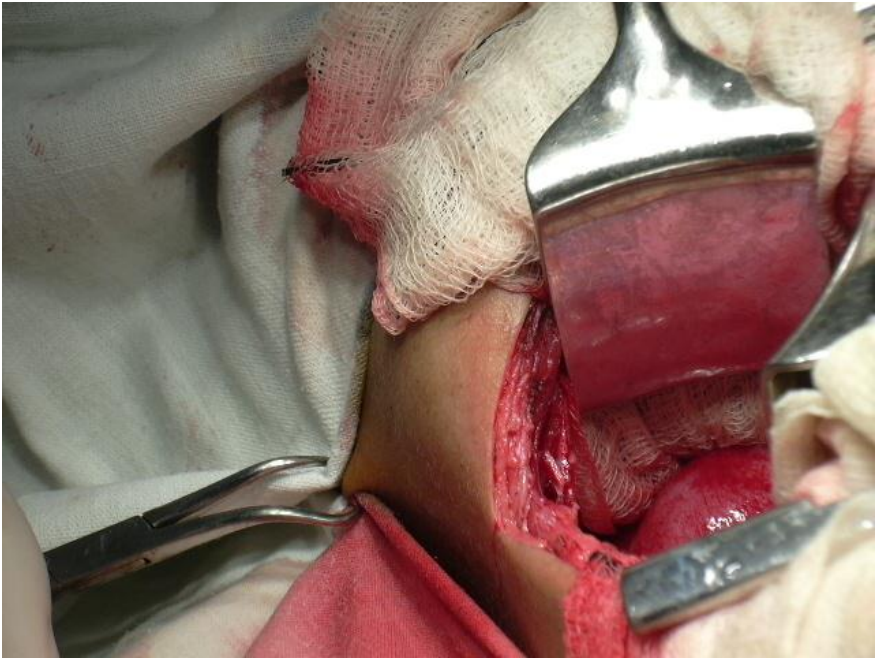
Post op X ray



Pott's spine







Cervical spine TB C5-6





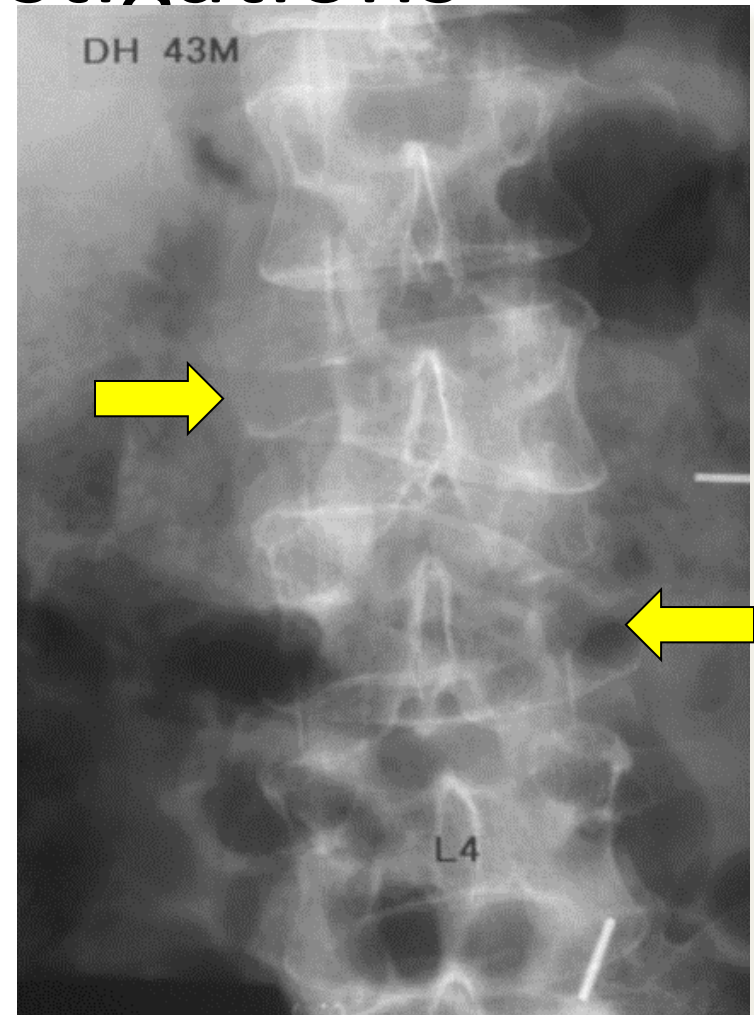




Radiological investigations

Plain x-rays

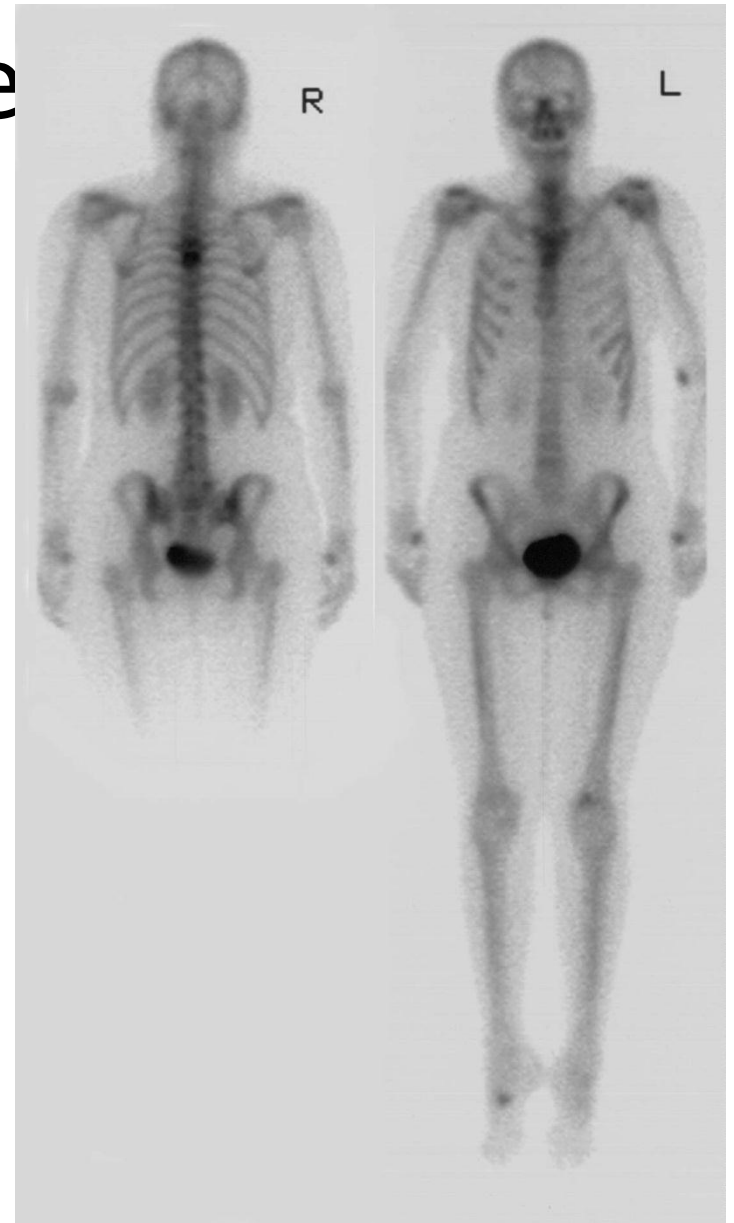
- Require 30–70% vertebral body destruction before evident on plain radiographs



Radiological inve

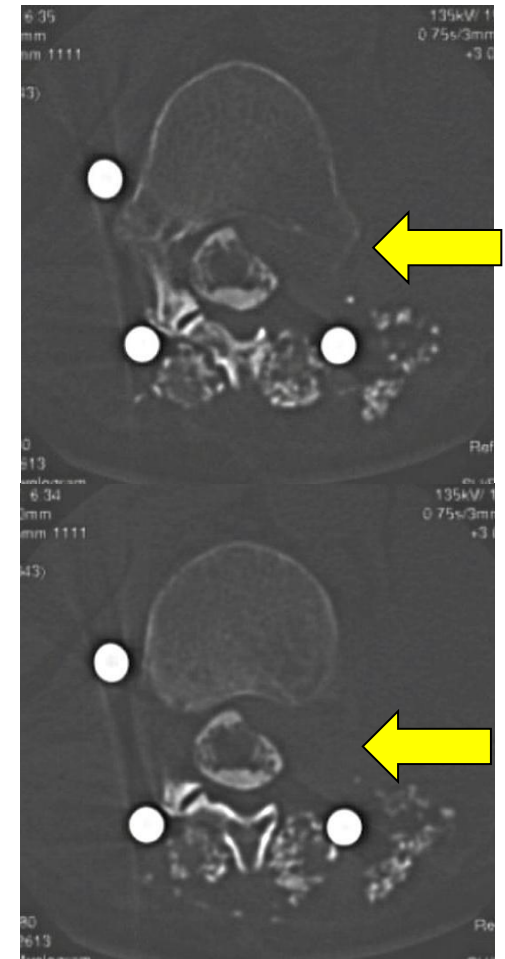
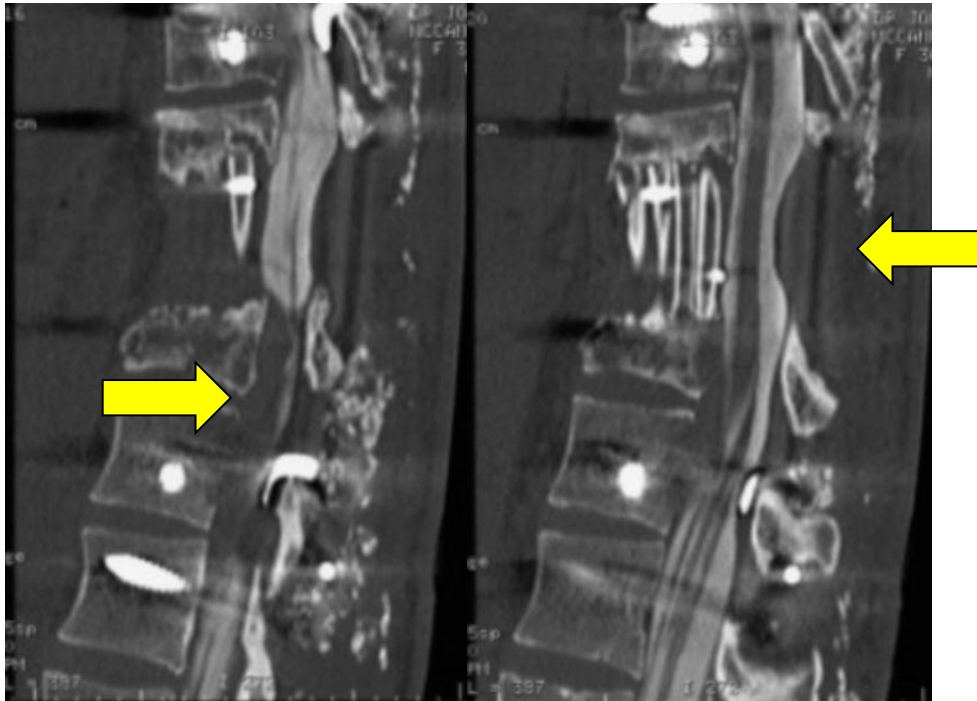
Bone scan

- Sensitive but nonspecific
- False negatives with rapidly growing (lung, kidney) or lytic tumors (myeloma, breast)



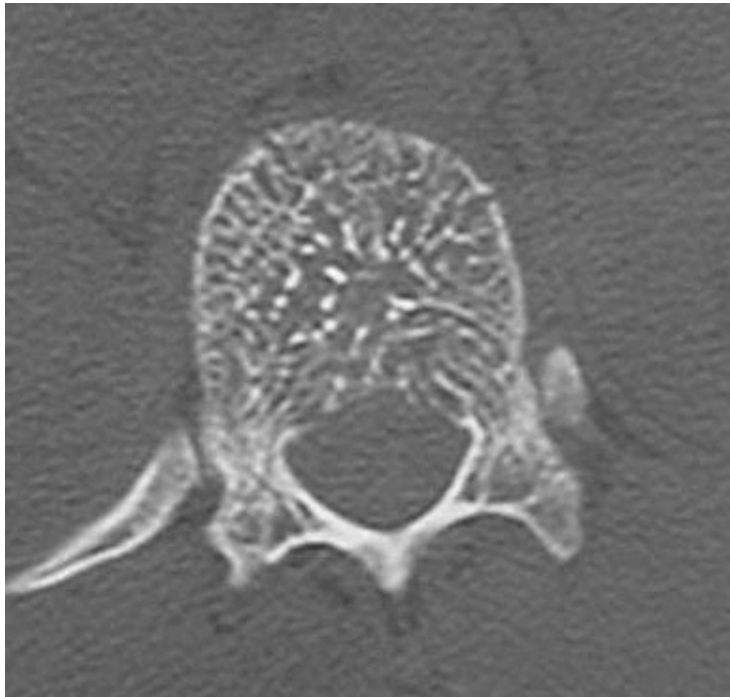
Radiological investigations

- Myelogram largely superseded and replaced by MRI
- May be useful in the presence of instrumentation



Radiological investigations

CT best for identifying bony involvement/definition



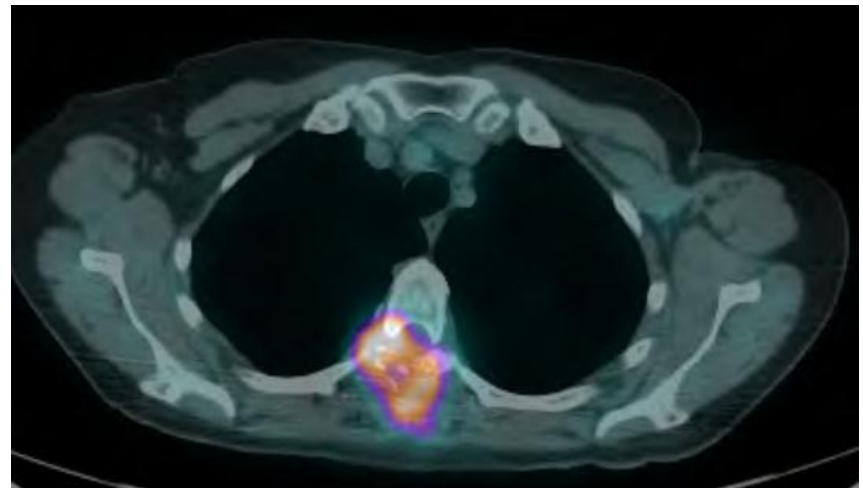
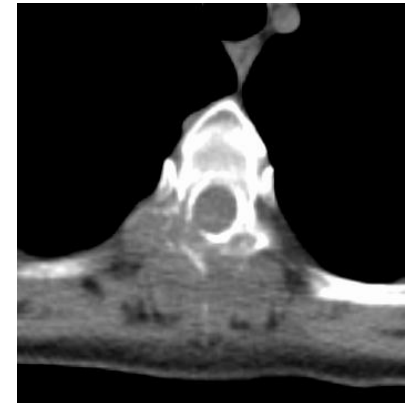
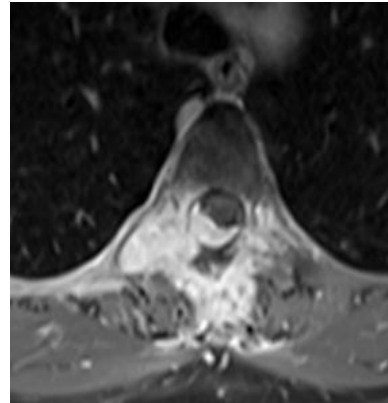
Vertebral haemangioma



Haemangiopericytoma of L1

Radiological investigations

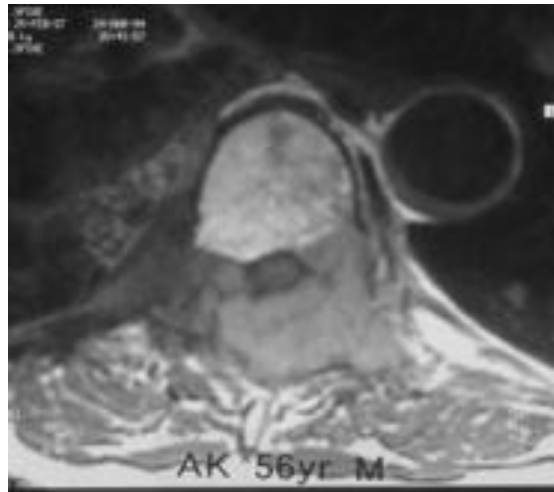
PET CT useful for staging and evaluation of recurrence



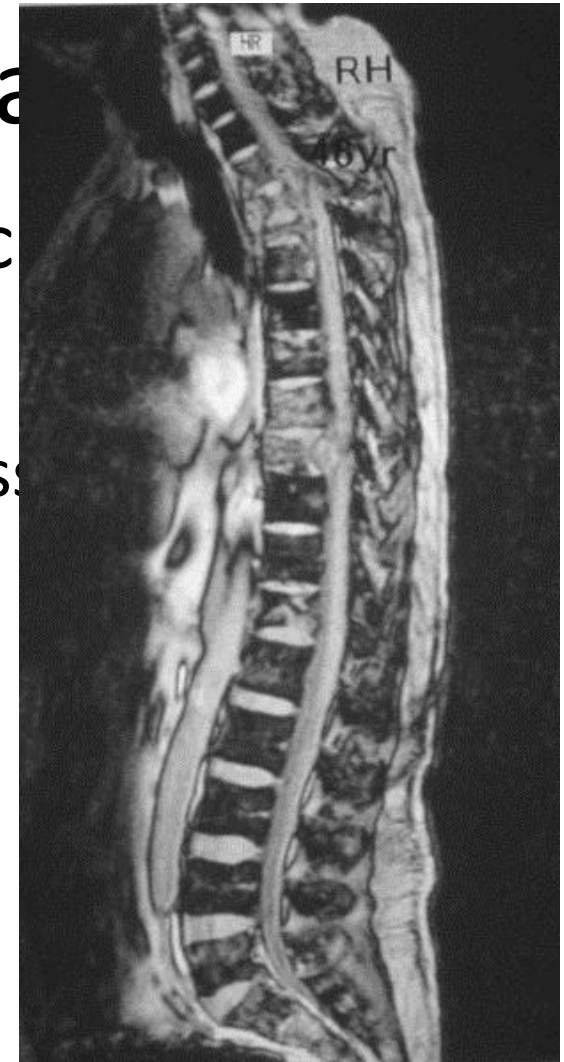
Radiological investigation

MRI the most sensitive and specific investigation

- Displays extent of bony and soft-tissue involvement



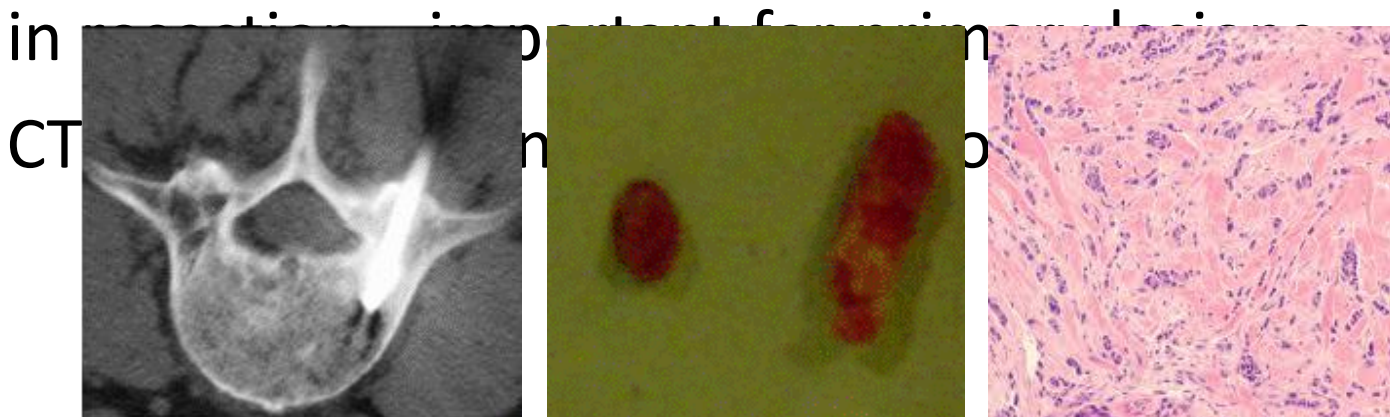
Renal cell carcinoma



Multiple secondary breast deposits

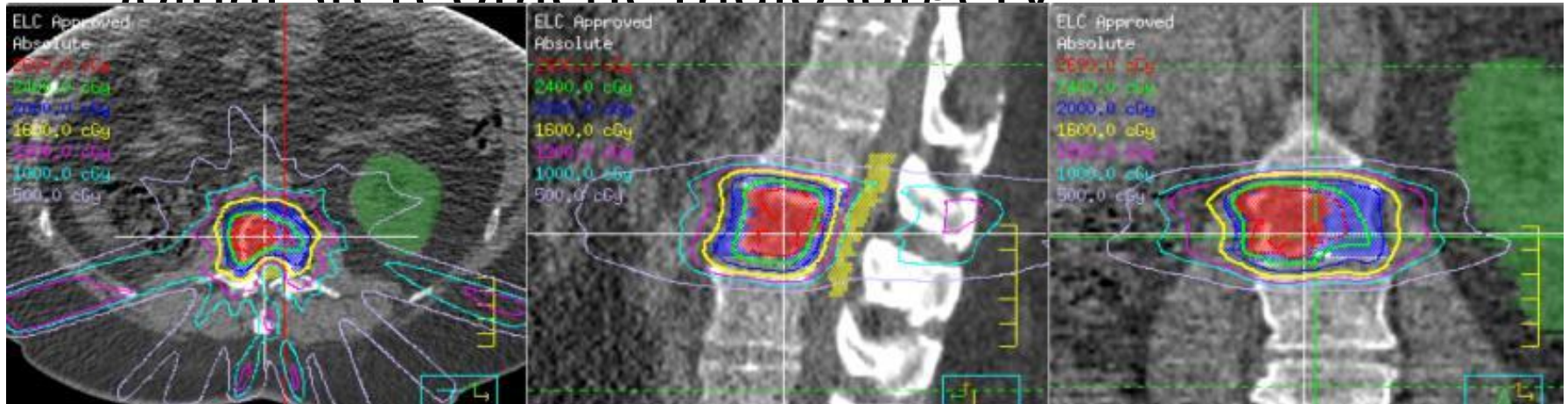
Biopsy

- Percutaneous needle biopsy
 - Diagnostic yield influenced by sample size
 - 2 mm or greater diameter – 90%
 - < 2 mm diagnostic yield decreased to ~ 50%
 - Track should follow anatomical planes and be included

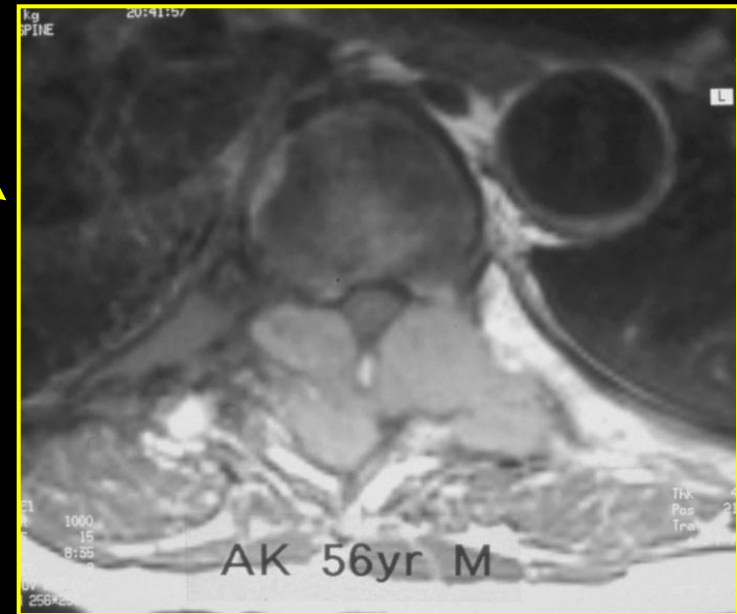
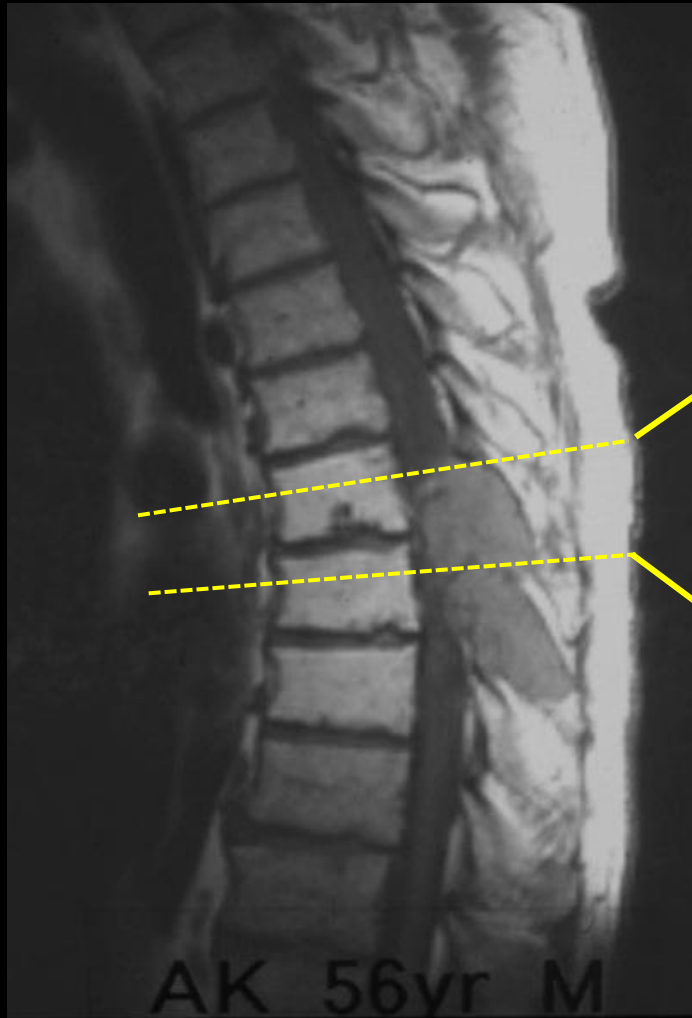


Radiation therapy

- Standard external beam radiotherapy
- Intensity modulated radiotherapy (IMRT)
- Proton beam radiotherapy
- Spinal stereotactic radiosurgery









- Workup identified mass in the right kidney
- No other metastatic lesions identified
- What now?



- Biopsy confirmed renal cell carcinoma
- What treatment would you recommend?



Considerations for surgery

- **Disease factors** :--
 - **Mechanical pain** which is unresponsive to drugs and activity modification –minimal 3 months eg PID , degenerated disc with SC compression
 - **Mal-alignment of the spinal column** –sagittal and or coronal with painful instability and loss of body balance eg listhesis , scoliosis

Consideration for surgery

- **Patient factors** :--
 - Patient 's physiology with risk stratifications
 - Severe intolerable pain
 - Cosmesis—deformity
 - Realistic functional expectation --activity

Consideration for surgery

- **Spinal infection** :--TB or Pyogenic with active lesion and SC / nerve root compression
- **Spinal tumor** :-- Intra or extradural / Intra or extra myelinal with neural deficit
- **Secondary tumor with severe pain** –malignant pain and disability with reduced quality of life
- **Trauma** with unstable fracture and or dislocation with or with out SC and nerve root injury

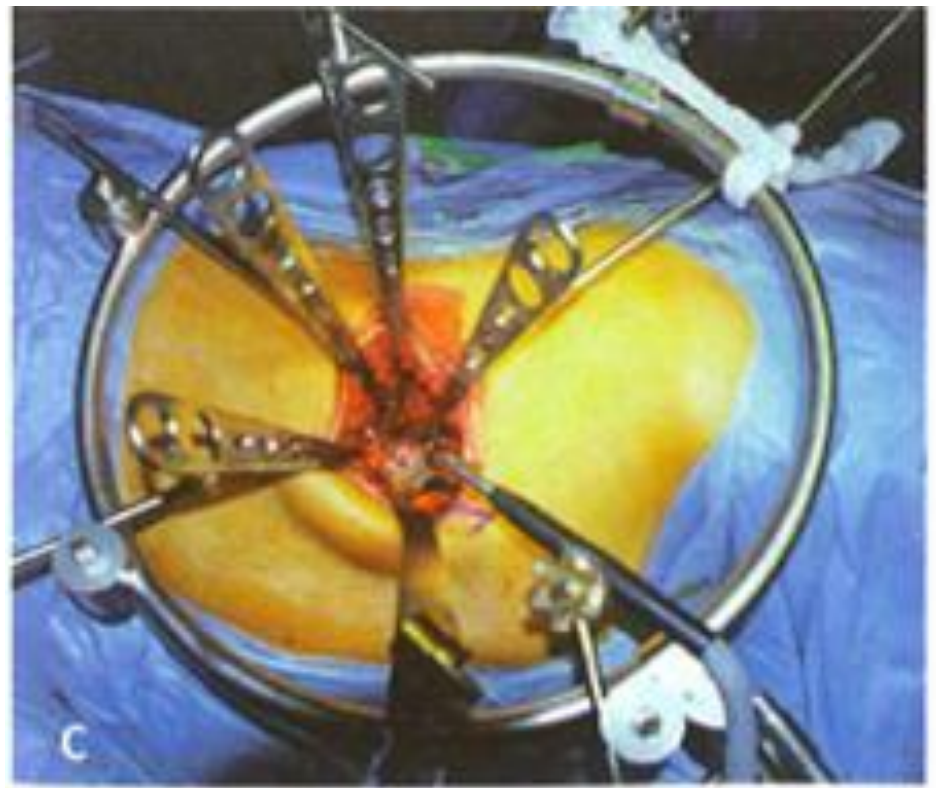
Considerations for surgery

- **System factor** :--
 - Facility based system care
 - Team building capacity --- imaging , anesthesia , rehab , intensive care , oncology , medical specialities , social and palliative care , pain care specialist , infectious disease specialist , psychiatrist etc .
 - surgeon's limitation in experiences
 - New technology eg . MISS

Accessible technology

Introduce special retractor system

ALIF



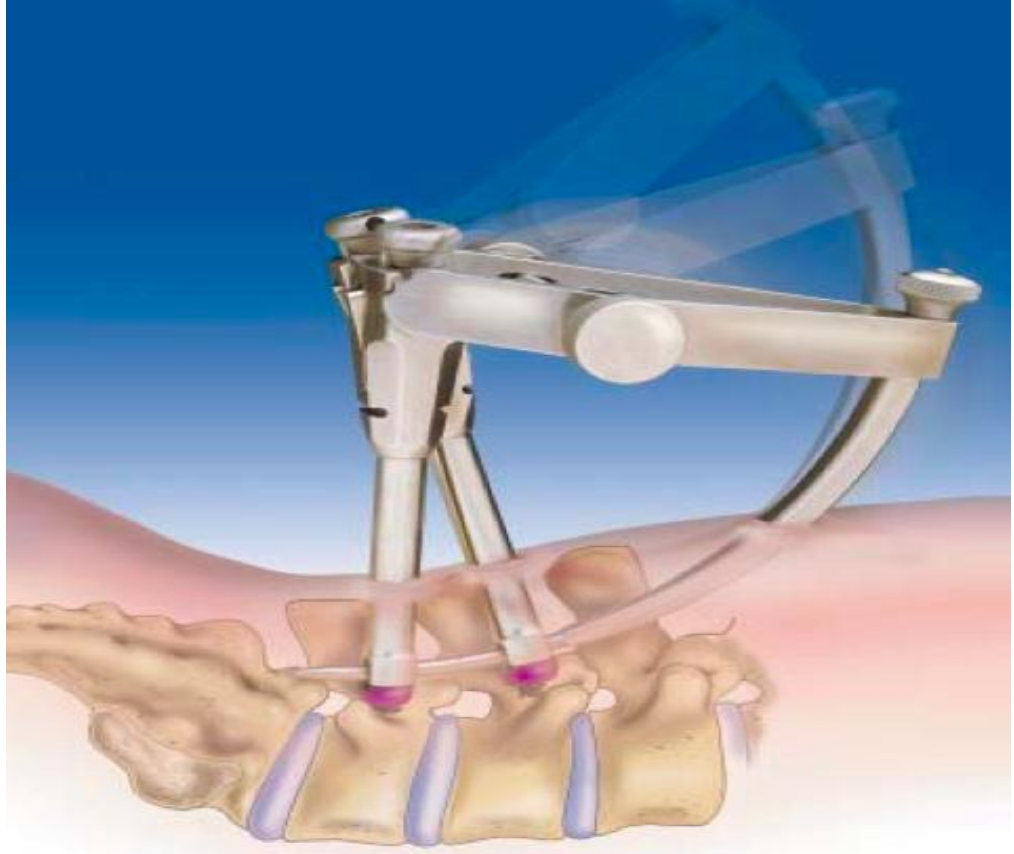
Access technology

- **Applicable Spine Endoscopy**
 - Endoscope (in a model) mounted onto the ring
 - Microscopy



Implant technology

Sextant

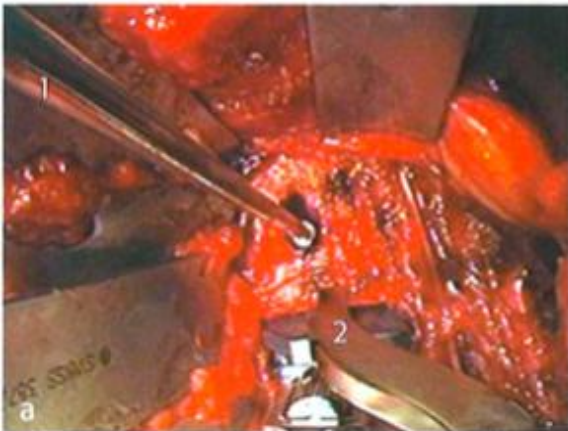


Rod insertion system surgical techniques

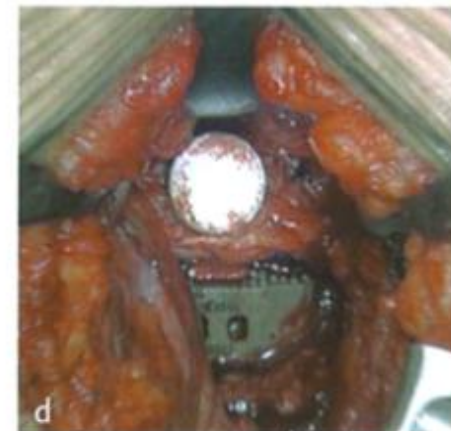
Bone graft technology

- Specialized instrument (harvesting tool)
 - Adjacent vertebra not from iliac crest

Sharp trephine



Fill with Ca phosphate

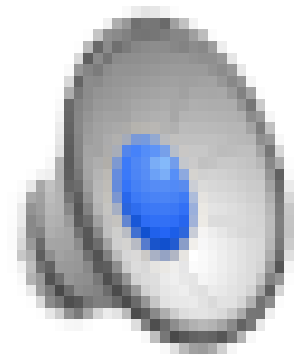


Case example

45 YO, Spondylolisthesis L4L5

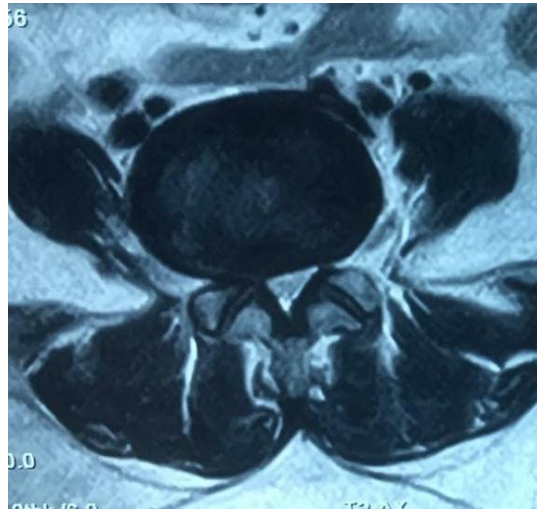


MIS TLIF

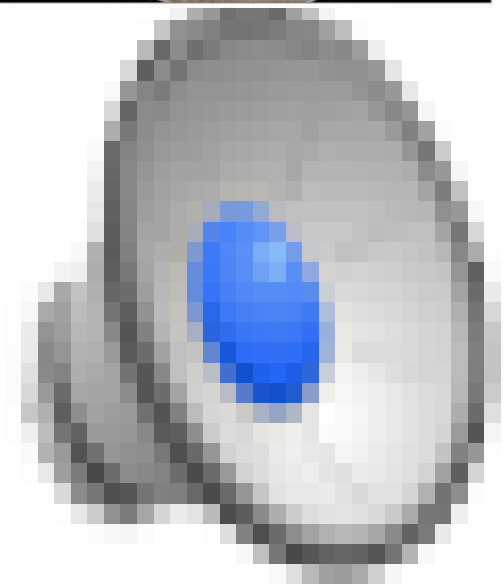
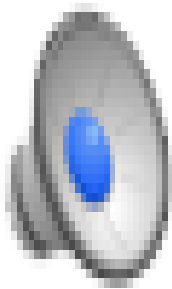
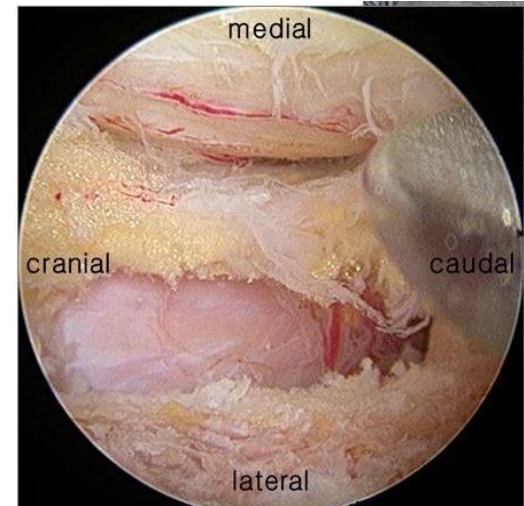
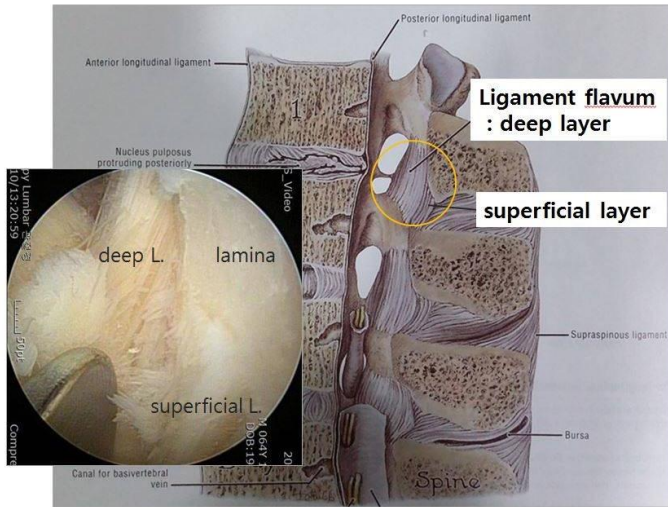


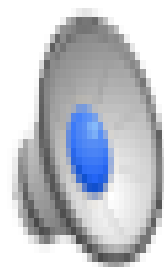
Case example

60 YO, PID with stenosis L4L5, L5S1



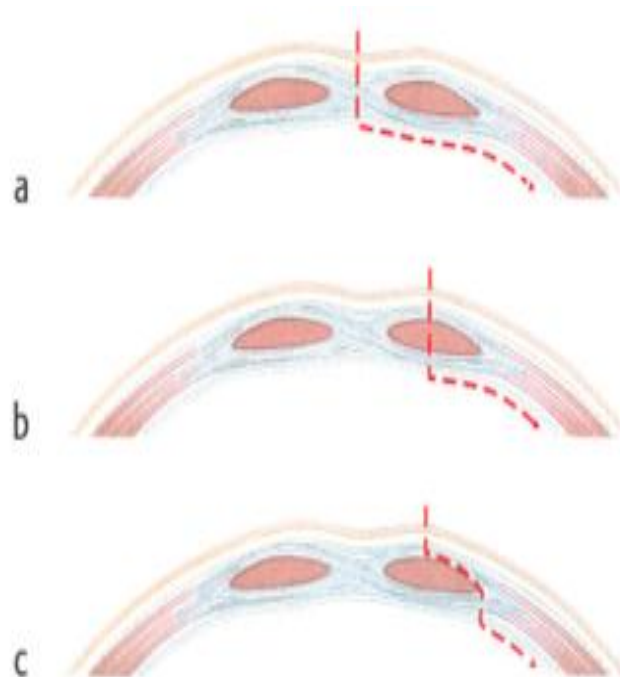
Endoscopic decompression unilateral biportal endoscopy





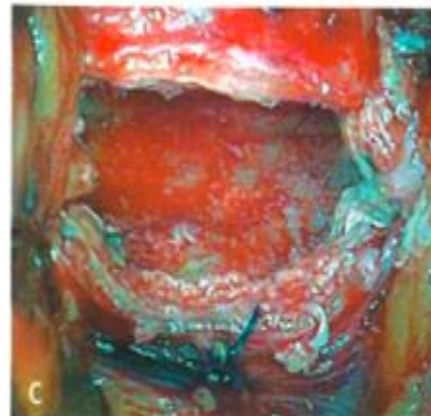
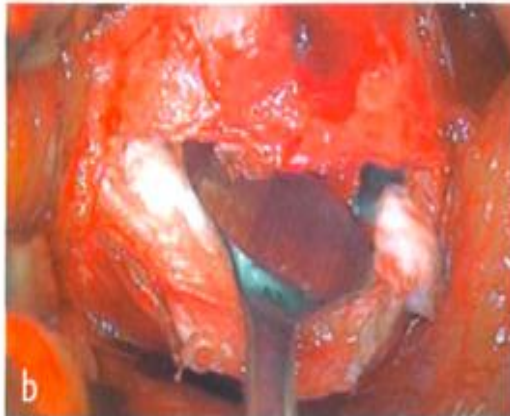
Lumbosacral surgery

- Retroperitoneal mini approach (L1 to S1)



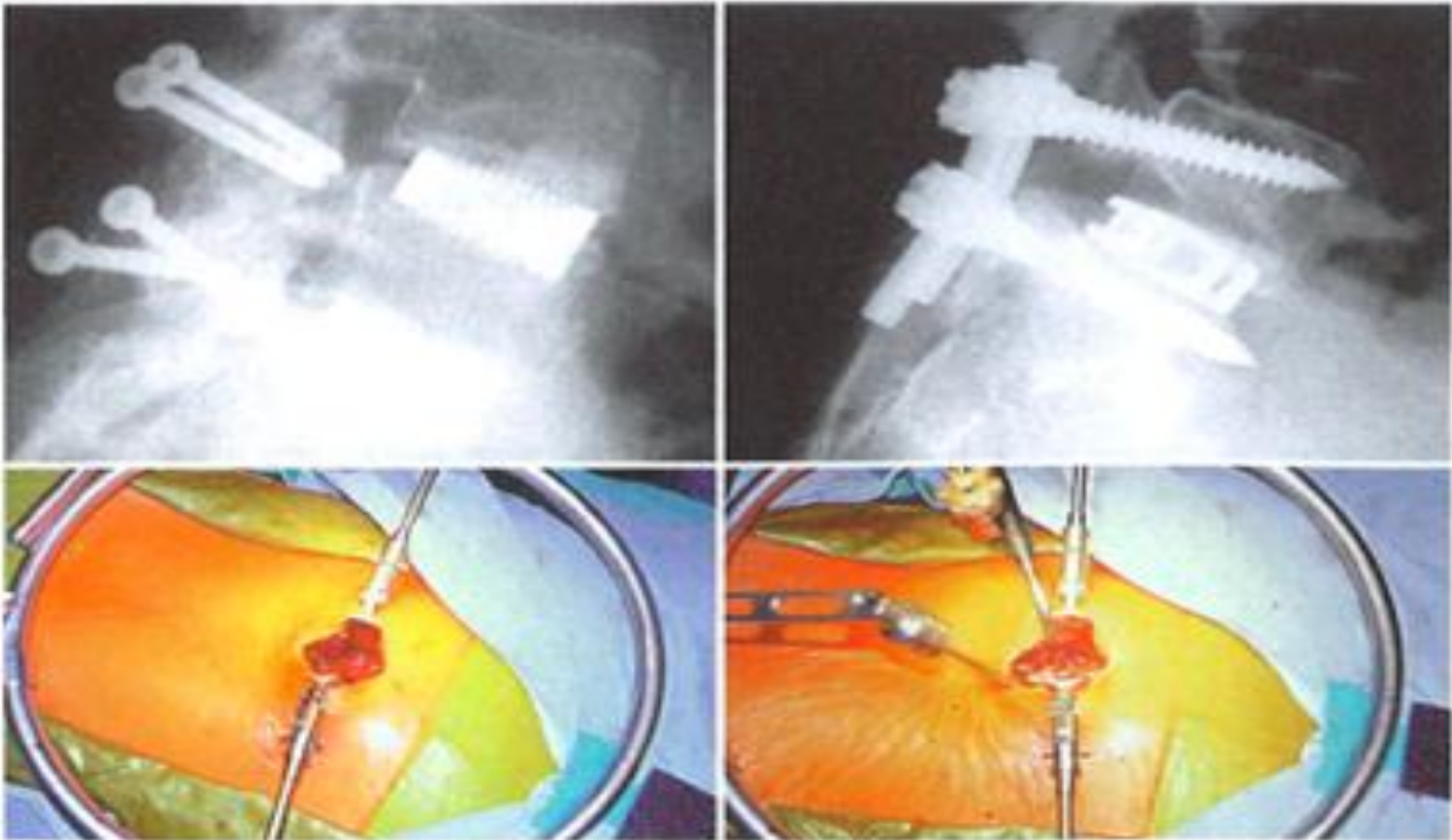
Lumbosacral surgery

- Retroperitoneal mini- approach (L1 to S1)
 - Special Hohman retractors



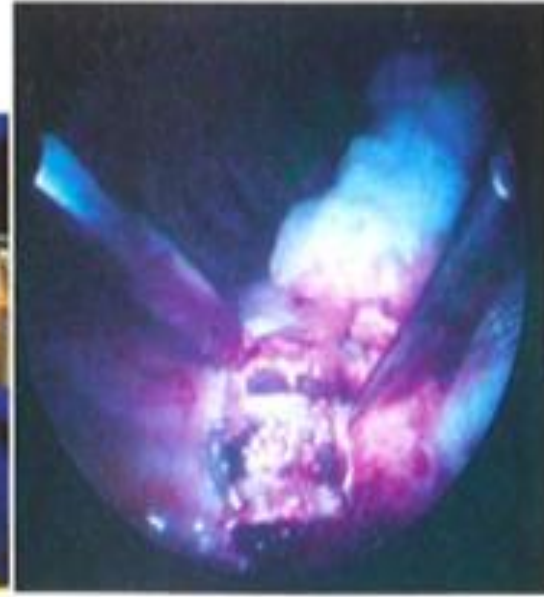
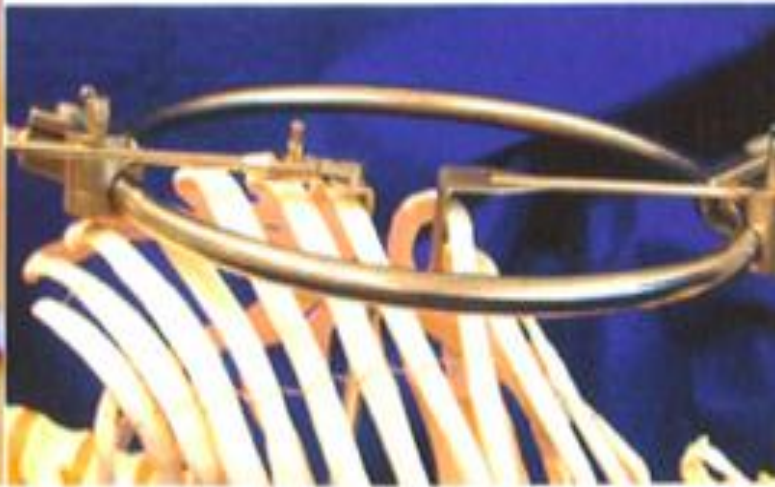
Lumbosacral surgery

- Posterior surgery (PLIF, TLIF/ALIF)



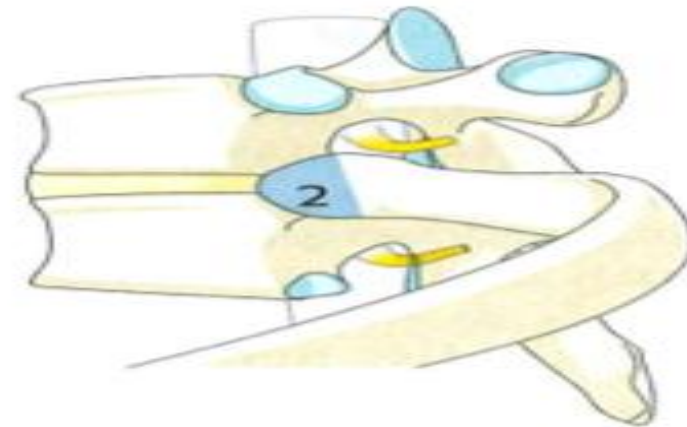
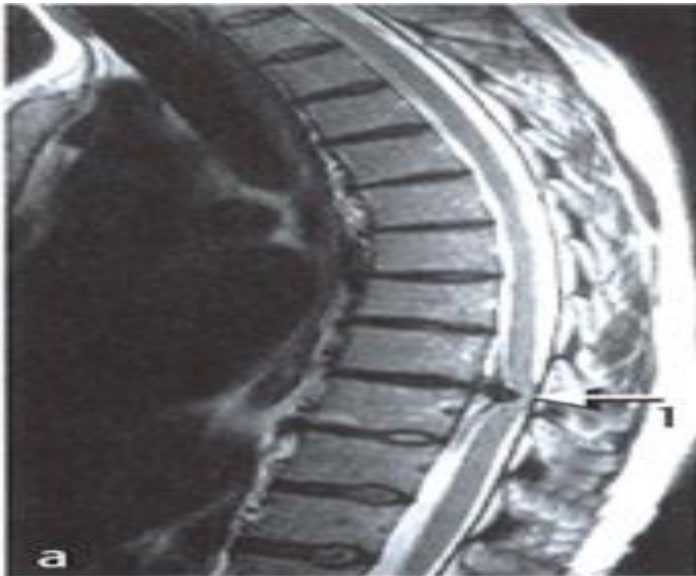
Thoracic surgery

- Mini -thoracotomy with Syn frame and endoscope
 - Special thoracic blades and Hohman retractors



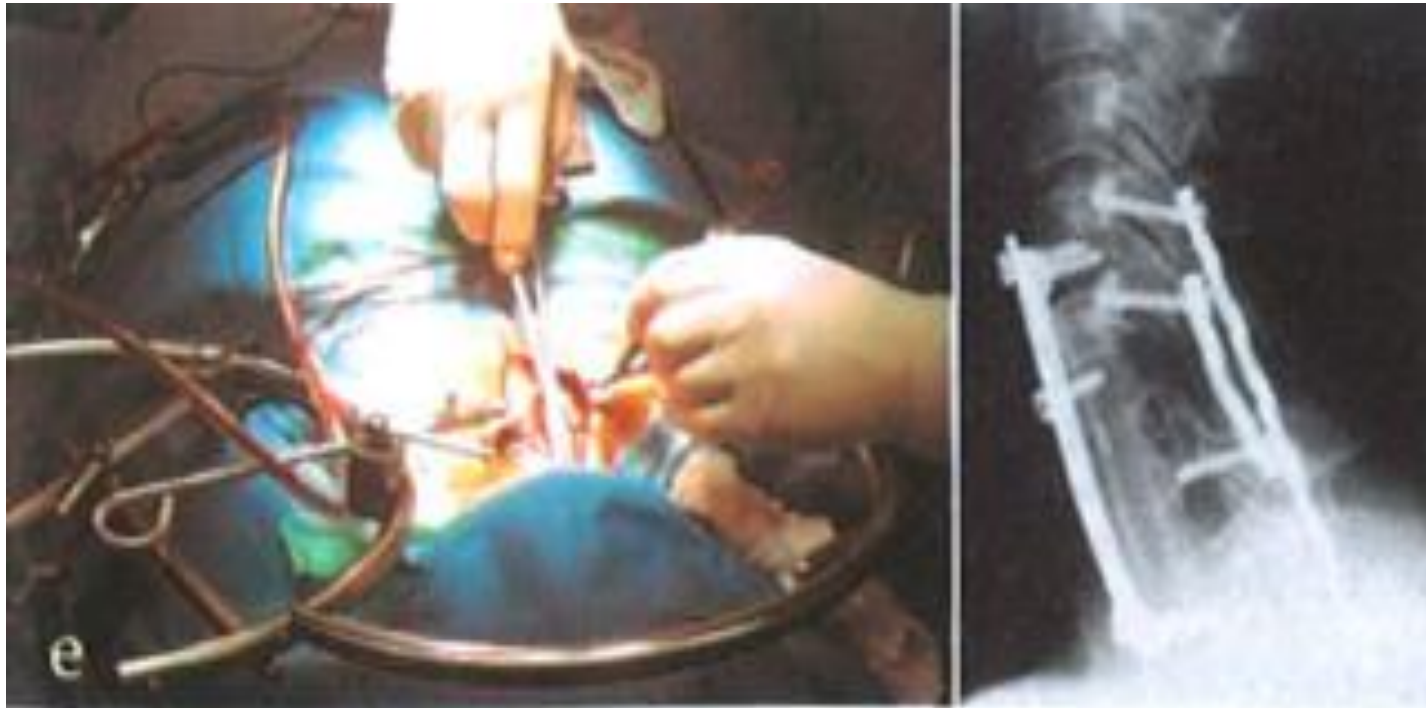
Thoracic surgery

- Anterolateral decompression for thoracic disc herniation



Cervical spine surgery

- Anterior and posterior cervical surgery
 - Syn frame and MISS retractors
 - Tumor surgery



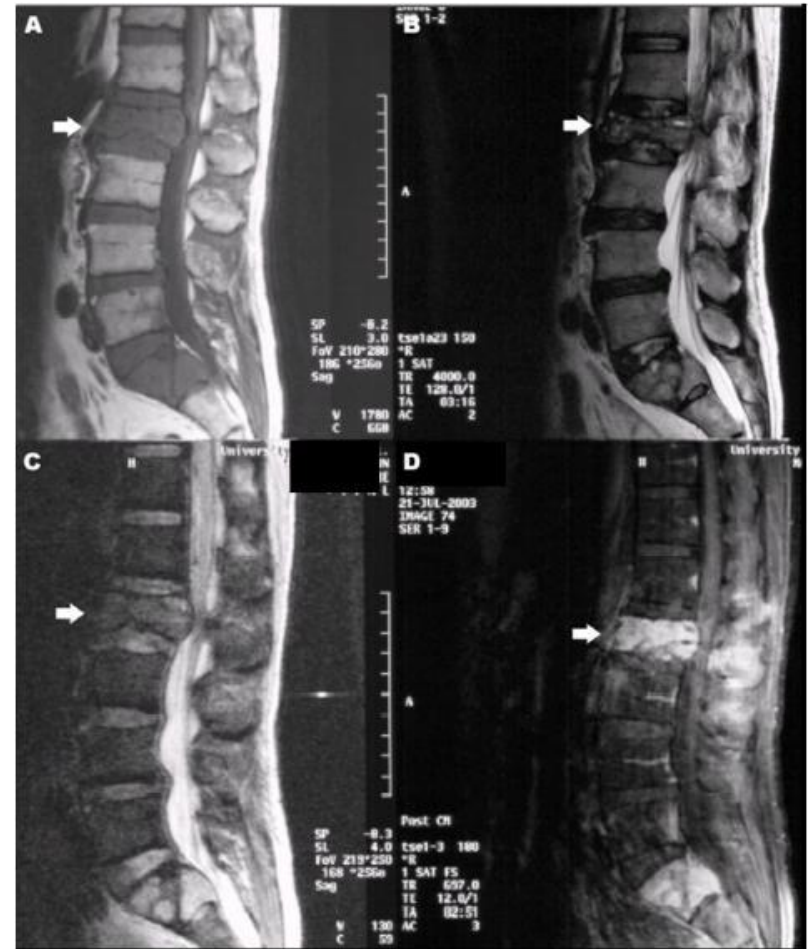
common complications of MIS

- **Durotomy –most common incidence**
- Symptomatic CSF leak
- Inadequate decompression
- New neurologic deficit
- Instrument malfunction
- Wound infection

Radiographic evaluation of age of fracture

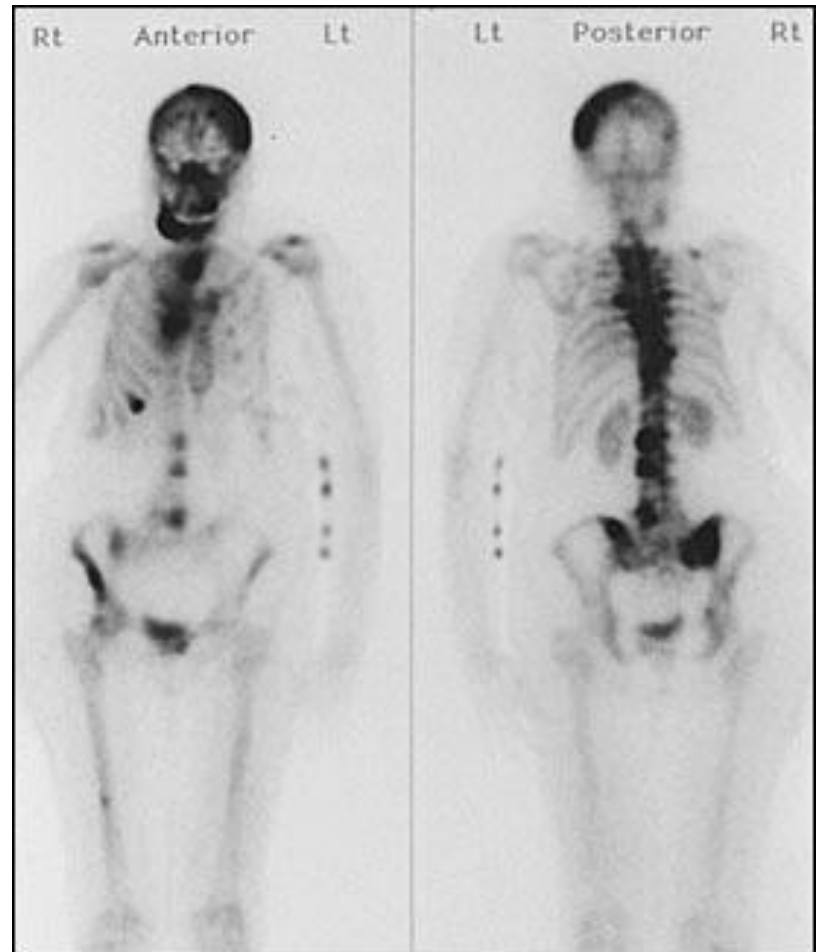
- Plain films
- MRI
 - Low signal T1
 - High signal T2
 - High signal STIR

Best indicator of age is the history.



Bone Scan

- Not as commonly used as MRI
- Been shown to have a 93% predictive value in vertebroplasty / kyphoplasty
- May be abnormal when MRI is normal



Maynard et al. Value of bone scan imaging in predicting pain relief in vertebroplasty. AJNR 2000;21:1807-12.

DXA SCAN OF OSTEOPOROSIS

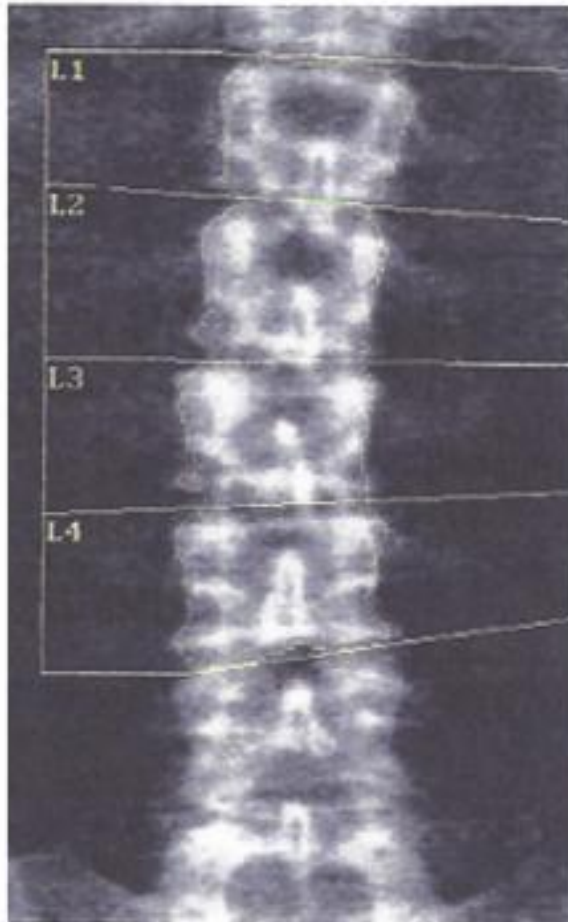


Image not for diagnostic use
Total BMD CV 1.0%

DXA Scan Information:

Example of a DXA scan showing a T score lower than -2.5 indicating osteoporosis



Results Summary:

Total BMD:	0.766 g/cm ²		T score:	-2.6			
Peak reference:	73%		Z score:	-1.1			
Age matched:	86%						
Region	Area [cm ²]	BMC [g]	BMD [g/cm ²]	T score	%PR	Z score	%AM
L1	12.06	7.45	0.617	-2.8	67%	-1.5	79%
L2	13.15	10.12	0.770	-2.3	75%	-0.9	88%
L3	12.71	10.65	0.838	-2.2	77%	-0.7	91%
L4	14.66	12.08	0.824	-2.7	74%	-1.1	87%
Total:	52.59	40.30	0.766	-2.6	73%	-1.1	86%



1-Fractured Vertebra



2-Insert Instrument



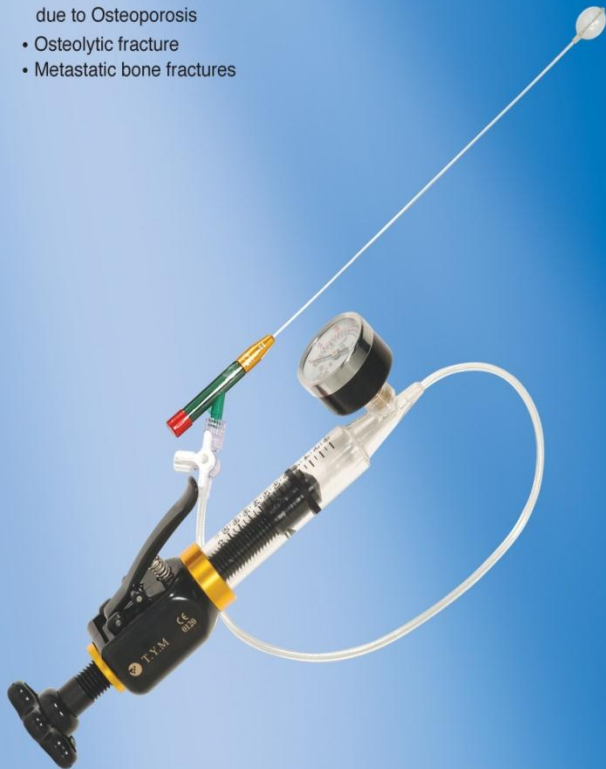
3-Inflate Balloon Tamp



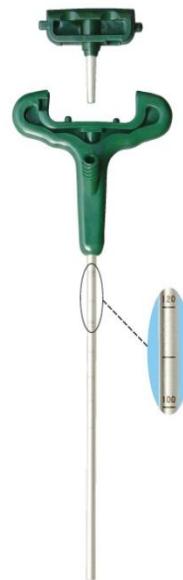
4-Fill with a "support cast"

Indication

- VCF(Vertebral compression fracture) due to Osteoporosis
- Osteolytic fracture
- Metastatic bone fractures



Accessory



Cannular & Expander & Cannular Cap



1st Needle



Pusher



Spacer



Wire-Pin

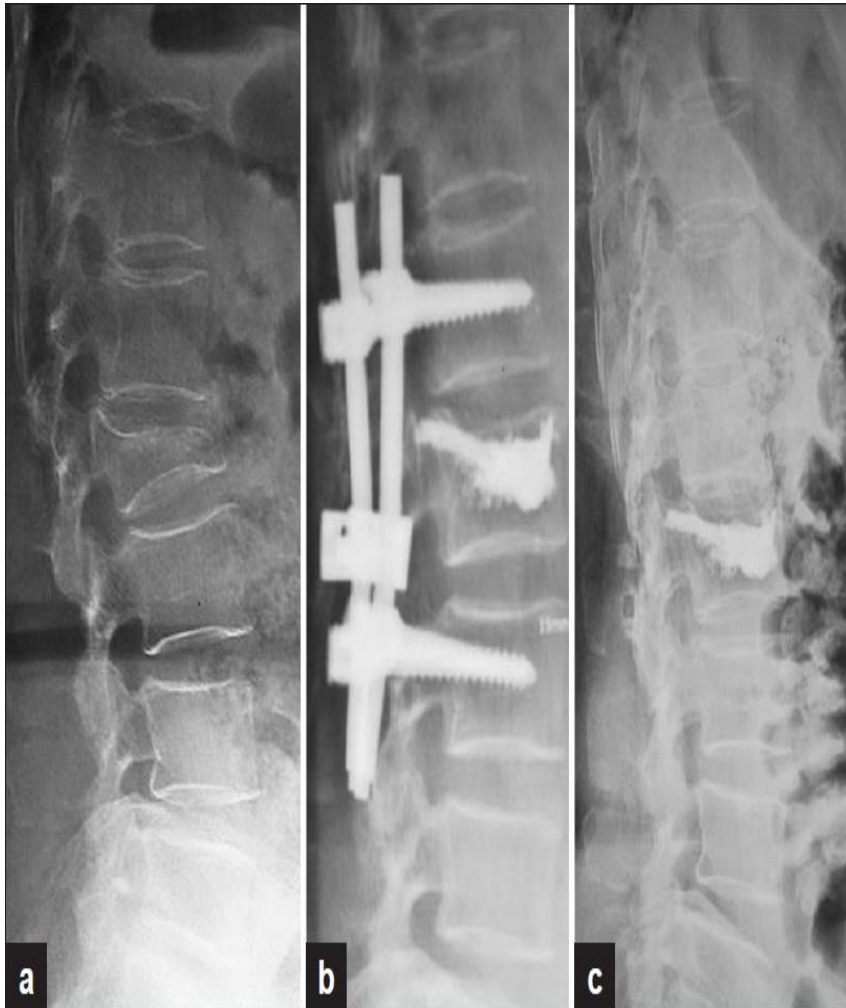
BEFORE KYPHOPLASTY



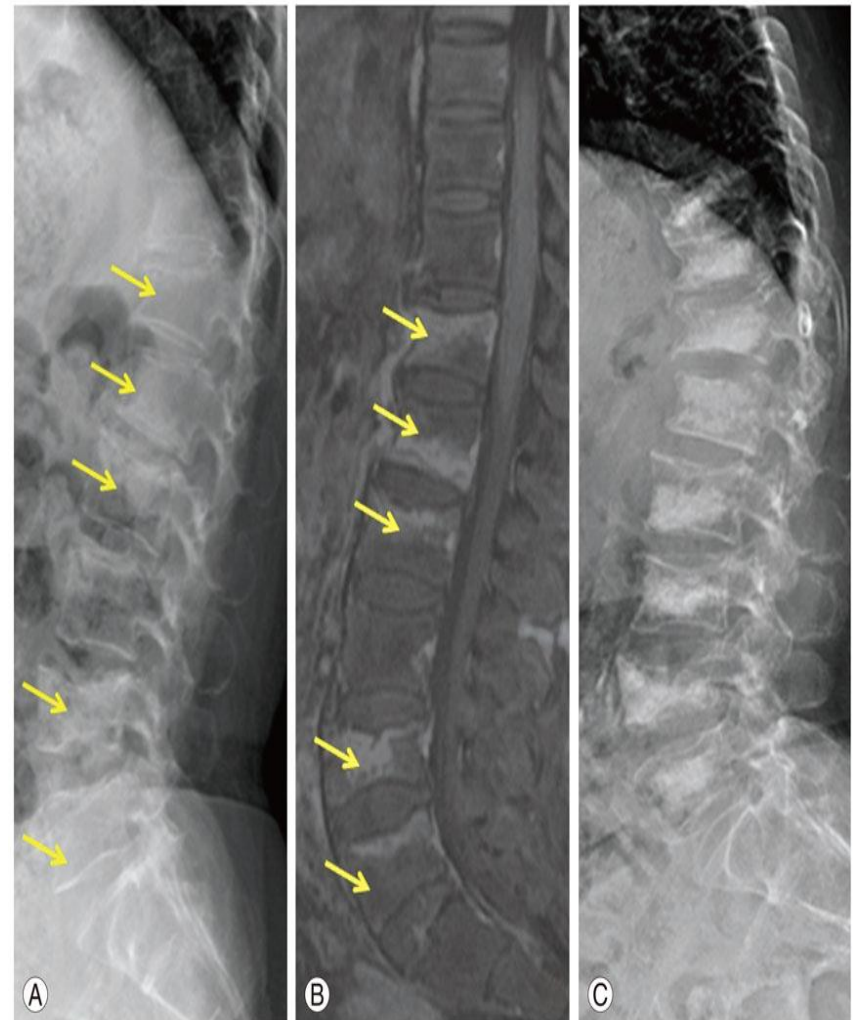
Post op Day 1 KYPHOPLASTY



Vertebroplasty with Fusion



Multi levels Vertebroplasty



Success of surgery

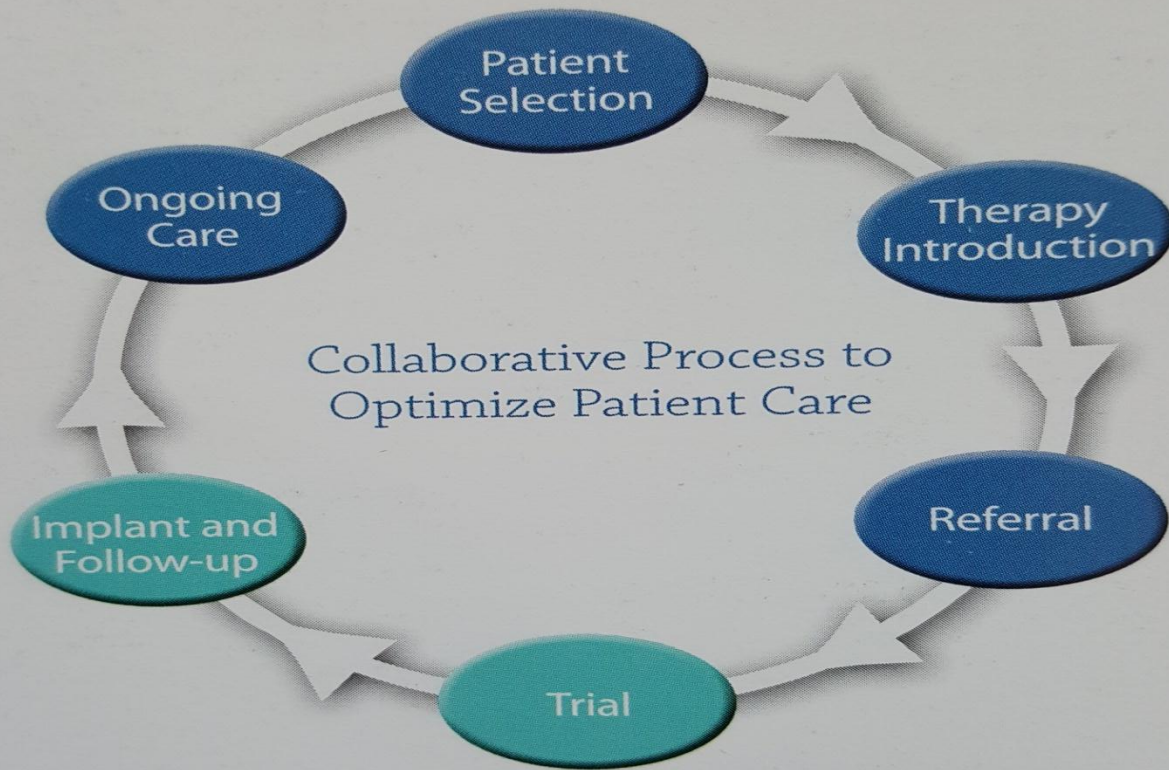
Success of surgery = pathology x technique
divided by Patient's Biology

*Wisdom in judgment and Realistic expectation is
most important --- Patient centered*

*Team Capacity and Facility based practice /
system based practice*

Complexity in success of surgery

- Not all the bad X ray are symptomatic
- Not all the bad x ray need surgery
- Not all the surgery has permanent pain free result
- Recurrent back pain and disability problem may be likely –redo surgery ?
- Balance between subjective and objective
- Clear information and understanding of patient



Primary Care Physician



Interventional Pain Specialist

Spine –Orthopaedic speciality

Myanmar Spine Surgery Society

Technical and service development in Spine Unit of
YOH and MOH → 500 cases operated per year

Trained spine specialists (12)

Collaboration with neurosurgeon , rehab and
physiatrist , imaging specialist , pain specialist ,
oncologist , anaesthesiologist , histopathologist
collaboration with AO Spine , APSS, AO EA, France ,
Switzerland , Japan , Korea , USA

Fully equipped Spine Centre Yangon

50 bed



Since last 20 years back , Prof Kyaw
Myint Naing continuously developing
spine discipline



SPINE SIG (Myanmar)



Take home message

- *Not all the spinal disorders need surgery*
- *Not all the surgery meet patient expectations*
- MIS technique may have promising results with expert hands
- Choose reliable spine center where good team based capacity is available
- Proper referral system is mandatory
- Community based information communication and rehabilitation is necessary

