SPINE DEGENERATIVE DISEASES

- *From Lecture of Prof. Mamdouh Mahfouz*

- **Modalities** : * X-ray * CT * MRI : Open , Closed , & Dynamic

SCAN PROTOCOL			
MRI		**CT**	
• ***Scout***	Sag	3 Protocols	
• Axials	T1 & T2	Disc Scan	Axial /2-4 mm / +C
• Coronal "Optional"	T1 or T2	Screening	Helical scan
• Sagital	T1 o T2	Selective Scan	3mm – Focus on selective disc
If + Contrast	– Sag.		
Slice Thickness	4 mm		

• ITEMS TO BE EVALUATED *"BCD LOSS" 7 Items*

1. **B**one Marrow → Changes
2. **C**ord Pathology
3. **D**iscs → Lesions
4. **L**igamentous → Pathology
5. **O**sseous → Changes
6. **S**pondylolithesis "Vertebral Displacement"
7. **S**pinal Canal → Stenosis

Keep in Mind By **"BCD LOSS"**

Then begin with the important

1. Spinal Canal Stenosis

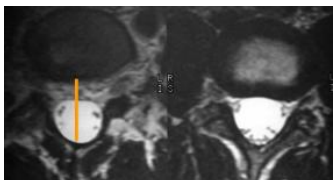
*** **3 Types** -Idiopathic – Developmental – Acquired

* **Normal Spinal canal**

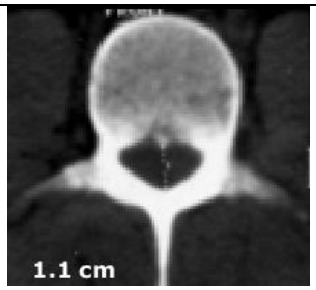
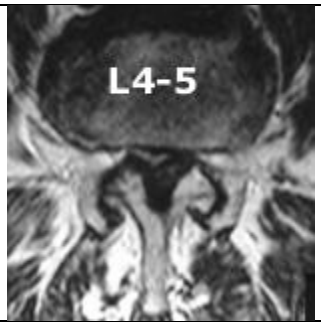
➔**LSS = 13 : 19 mm**

➔**CS = CSF Ant & post to the cord**

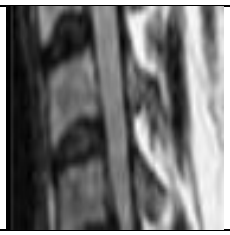
> 19 mm = Capacious LSS Canal



L. S. S.

1- Idiopathic	2- Developmental	3- Acquired
• Reduced sagittal diameter • < 1.3 cm in LSS	Hypertrophied : • Lamina • Fact • Lig. Flava "Normal Thread Like"	• Disc lesions • Osteophytes • Lig. Calcification & ossifications
		
* **10 mm** = ABSOLUTE spinal canal stenosis	N.B. Lateral recess diameter is also required	

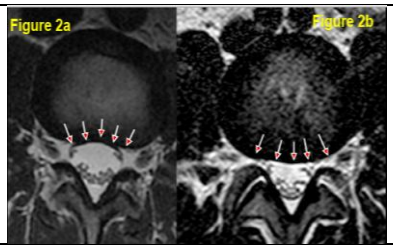
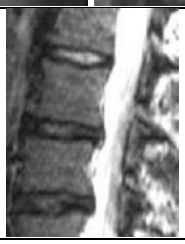
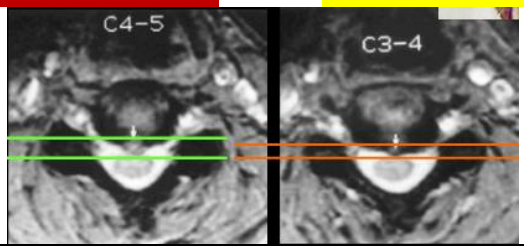
C.S.

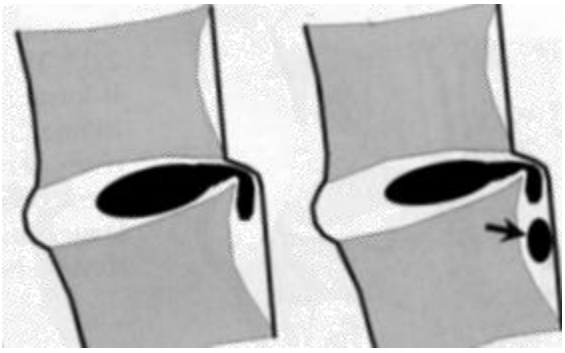
MILD	MODERATE	SEVER
Effaced CSF on one side	Effaced CSF on both side	On Both + squeezed Cord
		

2. DISC LESIONS

***** 3 Types -Degeneration -Bulge -Herniation**

⇨ Normal LSS disc → Concave posterior border + Normal hydration of neucleus

Degenration	Bulge	Herniation
1.Loss T2 Hydr. Signal /*@MRI* 2.Reduced height /*@All* 3.Air "Vaccum " /*@ X-ray & CT*	-**Intact** weak Annulus -Diffuse	-Torn Annulus -Focal "Rt , Lt , or Medline"
		
	➔**Protrusion** : Partially intact annulus 	
	• **> 2 mm = Herniation** * **< 2 mm = Protrusion** 	



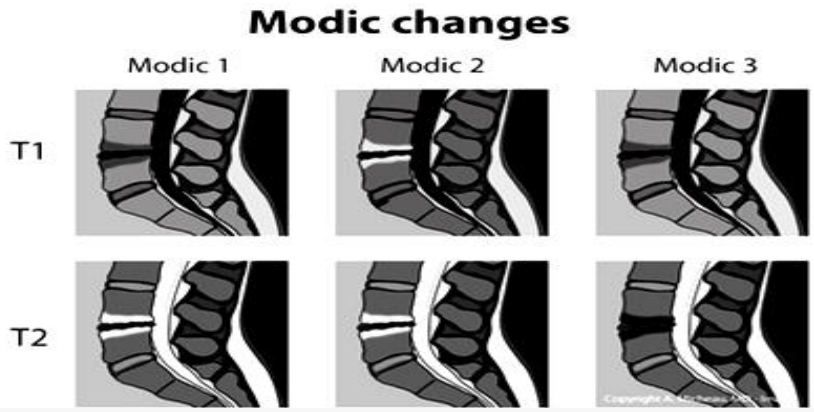
Disc Migration , & Sequestration

Disc Granulation should be in mind & not diagnosed as migration, ….. For **Non Surgical** ttt

D.D. Granulation is enhancing / Disc is not

3. BONE MARROW CHANGES

"MODIC CHANGES" → **3 Types** **I-Edema II - Fatty III- Sclerosis**



MODIC TYPE CHANGE	T1 SIGNAL	T2 SIGNAL	IMPLICATION
I	Low	High	Marrow inflammation & edema
II	High	High-intermediate	Fatty replacement of marrow
III	Low	Low	Trabecular microfracture and sclerosis

4. OSSEOUS PATHOLOGY

3 Types *Anterior Osteophytes *Posterior Osteophytes *Osteo-arthritis

1***Anterior Osteophytes:** Significant inly in CS ,… Large → Dysphagia

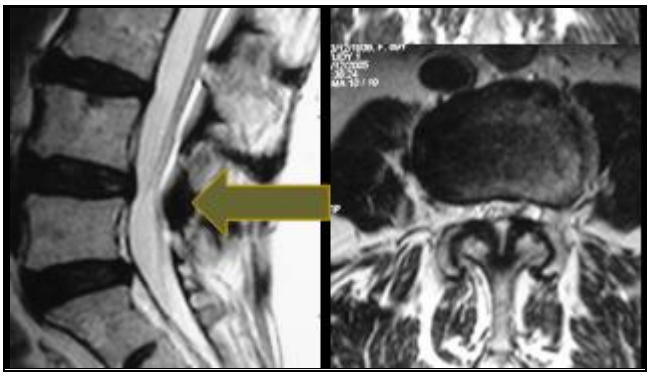
2* **Posterior Osteophytes: → Acquired Canal stenosis**

3* Osteoarthritis :

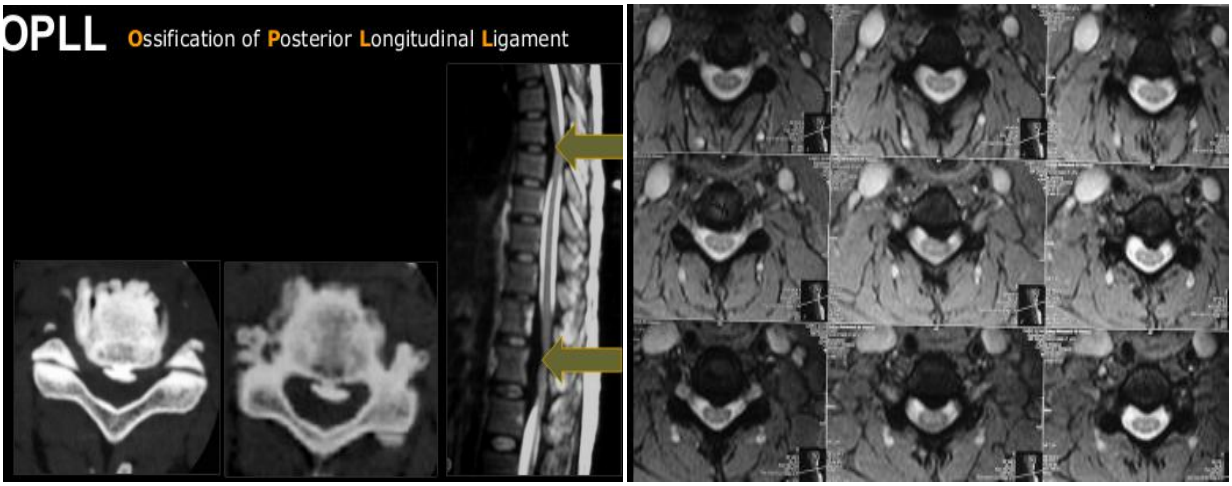
- Narrowing of the joint space
- Subarticular bone sclerosis
- Osteophytic lippings
- Pseudo cystic changes
- Vacuum phenomena

5. LIGAMENTOUS PATHOLOGY

3 Types - **H**ypertrophy - **C**alcification - **O**ssification

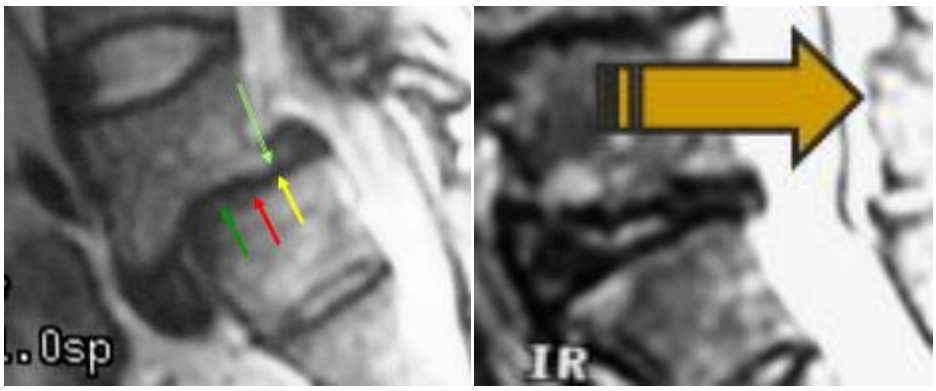


Hypertrophied Ligamenta Flava / Normally Thread Like



6. Vertebral Displacement

*** Spondylolithesis "4 grades": - Lytic "Fracture Pars" - Degenrative * Retrolithesis**

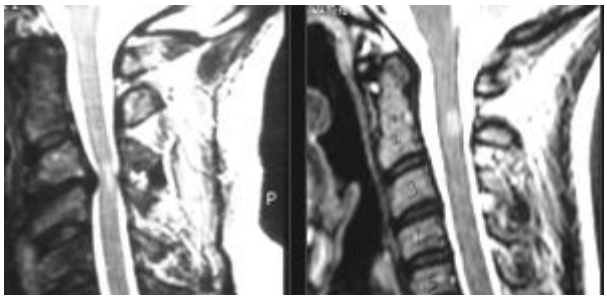


7. CORD PATHOLOGY

- **Edema**
- **Myelomalacia** [early, late]

⇨ Both → focal area of *low signal in T1* and *high signal in T2*

⇨ ***D.D.:*** *Clinical & +C*



- Differentiation by clinical presentation of the patient ± contrast injection.I is not written in Report , but described as "Bone Marrow edema"

Compressive myelomalacia
Focal area of high signal in T2 WIs
Decompression leads to regression or resolution of early lesions
NB: Early lesion shows contrast enhancement

DONOT FORGET PARAVERTEBRAL SHADOWs

- Hemorrhage, bone fragments,...[Trauma]
- Abscesses [inflammatory lesions]
- Neoplastic extra osseous masses [Tumors]

26 SEPT 2017