

METABOLIC BONE DISEASES

Vitamin D Deficiency

(in Children → Rickets / In Adults → Osteomalacia)



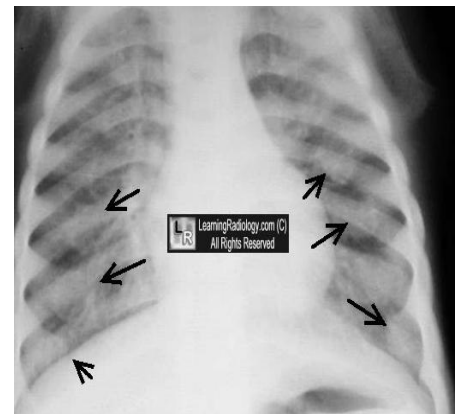
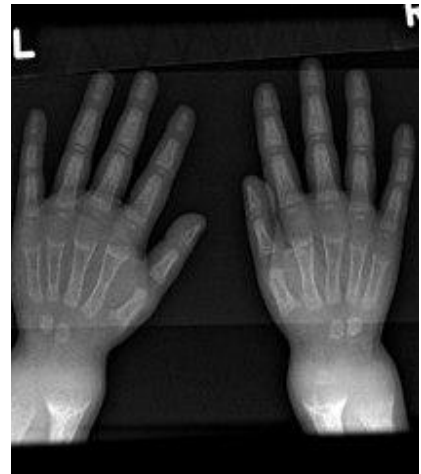
• Rickets

Def. : Increase uncalceified osteoid in immature bone.

3 Stages: 1-Active 2- Healing 3- & Healed

• Radiological “**Active**” manifestation : “7”

1. **Growth plate** → Wide
2. **Metaphysis** → Cupping & Fraying
3. **Cortex** → Indistinct
4. **Bone Density** → Decreased
5. **Bone Growth** → Retarded “Delayed oss. Centers”
6. **Ribs** / Ant ends “like metaphysis” → **Rosary Beads**
7. Bone softening → Bowing , Kyphoscoliosis

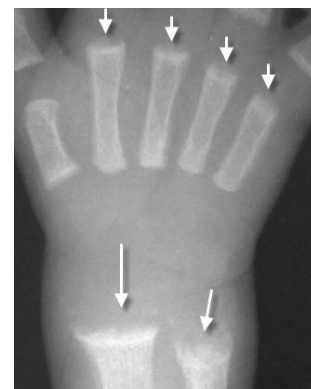


2- **Healing Rickets** , “patient on ttt / Vit D & Ca”

→ **Metaphyseal Calcification Bands**

3- **Healed Rickets** : Absence of all manifestations

- But one deformities may prolonged.



SUMMARY

• HYPO PHOSPHATASIA **'Vit D Resistance Rickets'**

- Autosomal recessive.
- Like Rickets , But when ttt with vitD → **Worsen**
- Low serum **Alkaline Phosphatase** → Mild to sever form of Rickets.
- Manifest as Rickets + Craniostenosis + **Nephrocalcinosis**

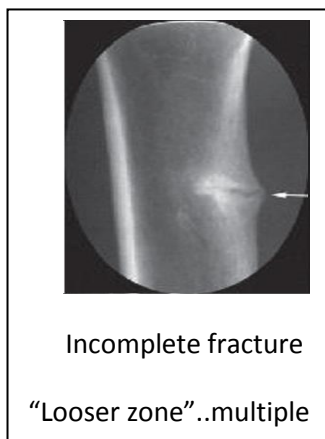


• OSTEOMALACIA

Def: Increased uncalceified osteoid in Mature bone.

1- Multiple **LOOSER's Zones** 2-Dec. Bone Density 3-Coarse faint trabeculae

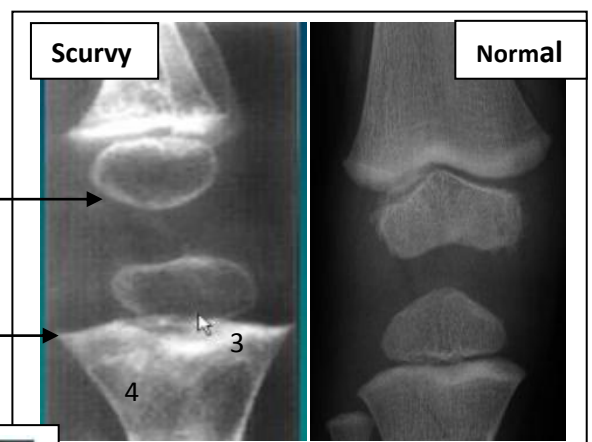
4.Softening



NB. Looser zone = *Milk Man* Fracture.

SCURVY

- Vit **C** deficiency - 6 m : 2 y
- Manifestation best seen at Knee joint :
 - 1- Osteoporosis = Dec. bone density
 - 2- **Pencil Thin cortex epiphysis**
 - 3- **Provisional Zone of calcification**
 - 4- **Metaphyseal Lucency**
 - 5- **Pelkan spur "Metaphyseal tibial spur"**
 - 6- Sub periosteal hematoma → Periost. Reaction



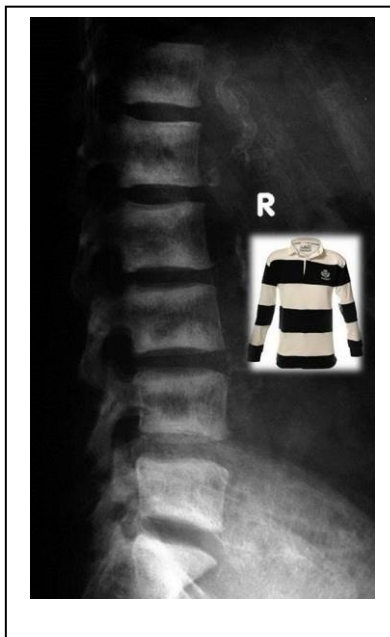
RENAL OSTEODYSTROPHY

⇒ Renal impairment → Bone dystrophy

⇒ Consists of: (Osteomalacia or Rickets + osteosclerosis + 2ry Hyperparathyroidism)

⇒ MANIFESTATIONS

- 2ry Hyper Para → Sub periosteal erosions +/- Brown tumor
- Soft tissue calcifications “mainly Arteries”
- Osteosclerosis → Rugger Jersey spine
- Osteomalacia → Looser’s Zones
- In Children → Rickets + Slipped capital femoral Epiphysis



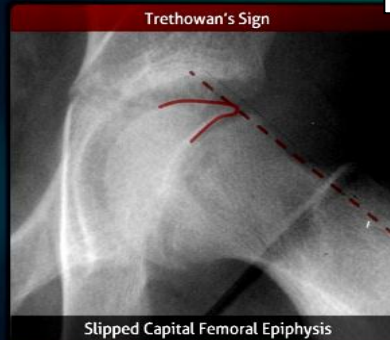
Sclerosis + malacia → Mosaic Bone



Slipped Capital Femoral Epiphysis

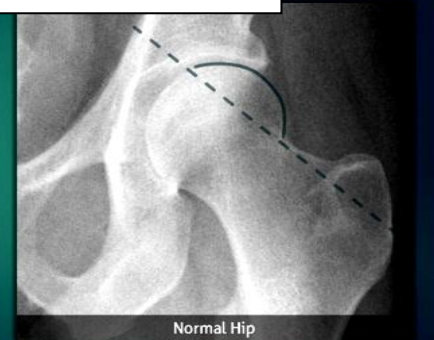
Trethowan's Sign

Superior femoral Line



Slipped Capital Femoral Epiphysis

Original image by Mikir / CC BY-SA 3.0



Normal Hip

Original image by Scuba-limp / CC BY-SA 3.0

⇒ OSTEOPOROSIS

Osteoporosis

Decreased bone mass

- Vascular: anemic states
- Drugs / Dietary Deficiency
 - Drugs
 - ◆ Steroids
 - ◆ Heparin
 - Dietary Deficiency
 - ◆ Scurvy
 - ◆ Malnutrition
 - ◆ Calcium deficiency
- Idiopathic osteoporosis
- Congenital
 - Osteogenesis imperfecta
- Toxic
 - Alcoholism
 - Chronic liver disease
- Endocrine/Metabolic
 - senile
 - postmenopausal
 - pregnancy
 - diabetes mellitus
 - hyperparathyroidism
 - Cushing's disease
 - acromegaly
 - hypogonadism

OSTEOPOROSIS RISK FACTORS



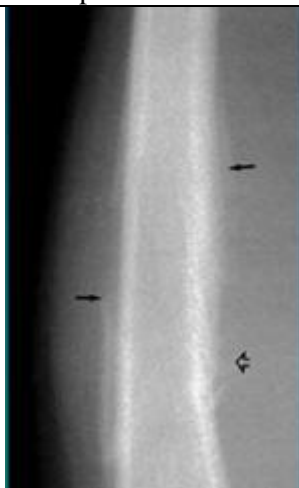



“Access” (leads to) Osteoporosis

SUMMARY

⇒ Causes of Localized osteoporosis:

- Immobility
- Infection
- Arthritis
- Post Fractures
- Sudeck's Atrophy : *dysfunction of the sympathetic nervous system, which is involved in the regulation of blood supply to the affected part.*

TOXIC EFFECTS ON THE SKELETON

Hyper Vit A	Lead Poisoning	Vinyl Chloride	Fluorosis
*Sub periosteal reaction +/- Pain *> 1 y age *ttt Stop vit A	*Metaphys SCLEROTIC BANDS *+/- Toxic Encephalitis	* Osteolysis of middle part of distal phalanx	DIFFUSE Hyperostosis
	 <p>Lead poisoning</p>		
	المواسير – ورق الجرايد	مصانع البلاستيك	مصانع الألمنيوم

Source : Lecture of Dr. Ahmed Wafei

<https://www.youtube.com/watch?v=doo1tKelnTI>

A.M.ABODAHAB

21 Oct 2017