

RICKETS

A disease of **growing bone in children** due to **defective mineralization of osteoid** at the growth plate, most commonly from **vitamin D deficiency**.

- 6 months to 3 years (rapid growth phase)

ETIOLOGY

- Nutritional vitamin D deficiency (most common)
- Low calcium intake
- Malabsorption
- Chronic kidney disease (renal rickets)
- Liver disease
- Genetic causes (vitamin D-dependent/resistant rickets)

PATHOPHYSIOLOGY

- ↓ Vitamin D → ↓ calcium absorption
- Hypocalcemia → secondary hyperparathyroidism
- Failure of mineralization at **physis**
- Soft, weak bones → deformities

CLINICAL FEATURES

General

- Irritability, delayed milestones
- Pot belly, muscle weakness

Skull

- Frontal bossing
- Craniotables
- Delayed fontanelle closure

Chest

- Rachitic rosary
- Harrison sulcus
- Pigeon chest

Upper Limb

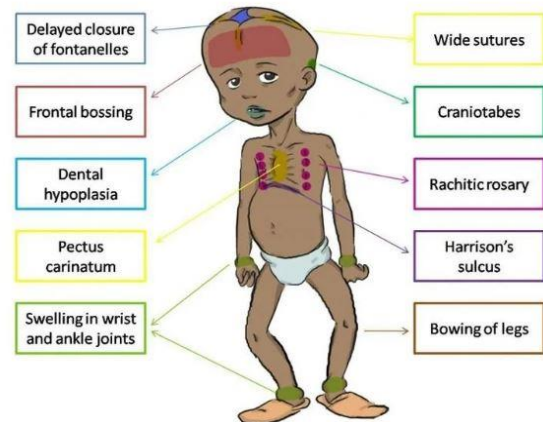
- Wrist widening

Lower Limb

- Bow legs (genu varum) or knock knees (genu valgum) or Windswept deformity (G varum on

one knee and G.valgum on the other knee)

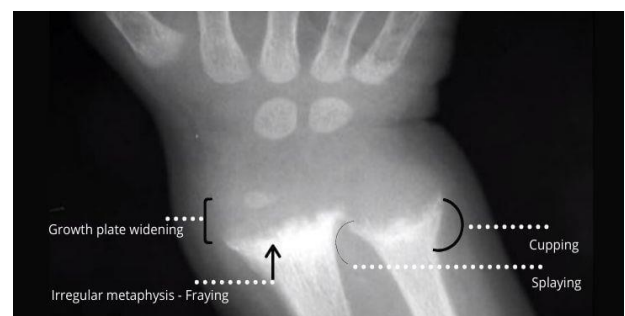
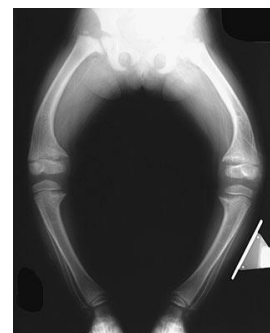
10 important clinical features in Rickets



INVESTIGATIONS

Test	Finding
Serum calcium	Low / normal
Serum phosphorus	Low
ALP	High (most sensitive)
Vitamin D	Low
X-ray wrist	Cupping, fraying, widening of metaphysis

RADIOLOGICAL FEATURES OF RICKETS (WRIST X-RAY IS CLASSIC)



1. **Metaphyseal CUPPING** – concave, cup-shaped metaphysis
2. **Metaphyseal FRAYING** – irregular, fuzzy metaphyseal margin
3. **Metaphyseal SPLAYING (widening)** – flared metaphysis
4. Widened growth plate – due to unmineralized osteoid
5. Generalized osteopenia
6. Delayed appearance of ossification centers
7. **Bowing of long bones** (in lower limbs)
8. **Rachitic rosary** – beading at costochondral junction (chest X-ray)
9. **Loozers zone** : are transverse radiolucent pseudofractures seen due to defective bone mineralization

MANAGEMENT

Medical

- Vitamin D therapy (Stoss therapy - Administration of a single large dose of Vitamin D)
- Calcium supplementation
- Sunlight exposure

Orthopedic

- Deformities usually correct with surgery.
- Severe deformity → corrective osteotomy (after healing)

COMPLICATIONS

- Permanent deformities
- Pathological fractures
- Short stature