Osteomalacia

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Outline

• What is osteomalacia?
• What causes it?
• Diagnosis
• Treatment
• Pitfalls
Functions of Bone

- Structural
  - Mechanical
  - Protective
- Metabolic
  - Calcium reservoir
Responses to Disease

• Structural
  – Bend
  – Break
  – Hurt

• Metabolic
  – Hypercalcaemia
  – Hypocalcaemia
Bone turnover
Disorders of bone turnover

Resorption

Formation
Disorders of bone turnover

- Resorption
- Osteomalacia
Rickets/Osteomalacia
Rickets/Osteomalacia
Clinical features

- Bone pain
- Deformity
- Fracture
- Myopathy (some causes)
- Hypocalcaemia (vit D deficiency)
Causes of Osteomalacia

- **Failure of calcium supply**
  - Vitamin D Deficiency
    - Abnormal vitamin D metabolism
    - Extreme calcium deficiency

- **Failure of phosphate supply**

- **Failure of bone formation**
  - Aluminium
  - Etidronate
Osteomalacia and Vitamin D

Peacock, 1984
Vitamin D status in middle age

Hypponen, 2007
Diagnosis

- Gold standard = biopsy
- Looser’s zones
- Elevated (bone) ALP + other supportive features
  - Low vitamin D
  - Low PO$_4$
  - Raised PTH
Treatment

• Native vitamin D
  – Colecalciferol 40 000 units daily x 10 days
  – Then colecalciferol 20 000 weekly

• Can use active metabolites
  – More tricky
  – More dangerous
  – Don’t treat the cause
Vitamin D treatment of osteomalacia

10µg \equiv 400iu daily

Peacock, 1984
Pitfalls

• Primarily relate to diagnosis
  – Mistake osteomalacia for something else
  – Mistake other things for osteomalacia
  – Miss other causes of osteomalacia
Summary

• Vitamin D deficiency is common
• Frank osteomalacia is much less common
• Usually a biochemical diagnosis
  – But can go wrong
• Treat with native vitamin D
• Other causes need specific treatments