ANPH 252:

Skeletal Pathology METABOLIC DISEASE

Metabolic Bone Disease

- Osteoporosis
- Osteomalacia/Rickets
- Gout
- Pagets Disease

Osteoporosis

- One of the most common and serious bone diseases
- General or localized deficiency of bone matrix
- Usually caused by accelerated resorption of bone
- Loss of mineral salts in bone cause it to become more lucent
- Bone densitometry (DEXA scan) and CT are imaging modalities of choice
- Generalized risk factors include: low estrogen levels, early menopause, first degree relative with condition, stature, insufficient calcium/vit D intake, steroid treatments, sedentary lifestyle,
- Elderly people more susceptible due to being less active and poor diets

Osteoporosis

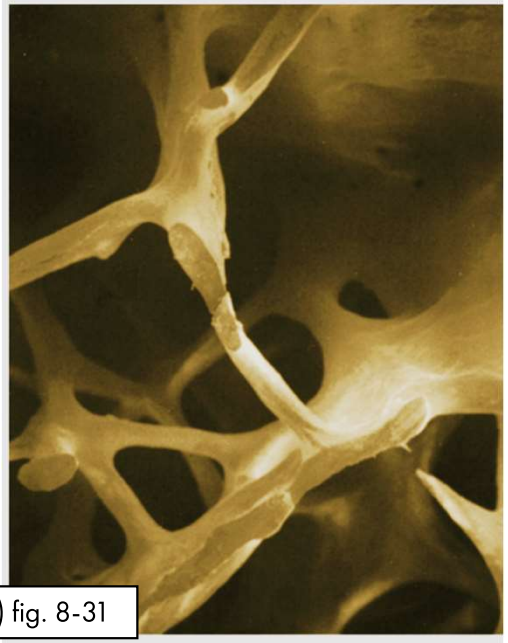
- On general imaging, we see cortical thinning with irregularity and resorption of endosteal or inner surfaces

- Treatment includes weight-bearing exercise to help build bone density and muscle mass, high calcium diet, vitamin D supplements, and medications that help to balance remodeling process



A Normal

From Kumar V, Abbas A, Fausto N: *Robbins and Cotran pathologic basis of disease*, ed 7, Philadelphia, 2005, Saunders.



B Osteoporosis

ar V, Abbas A, Fausto N: *Robbins and Cotran pathologic basis of disease*, ed 7, Philadelphia, 200

Eisenberg (6th ed.) fig. 8-31

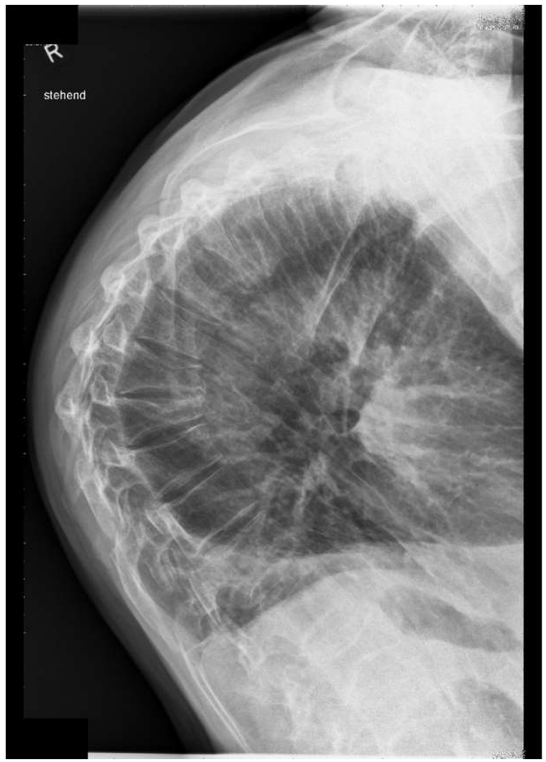
Osteoporosis

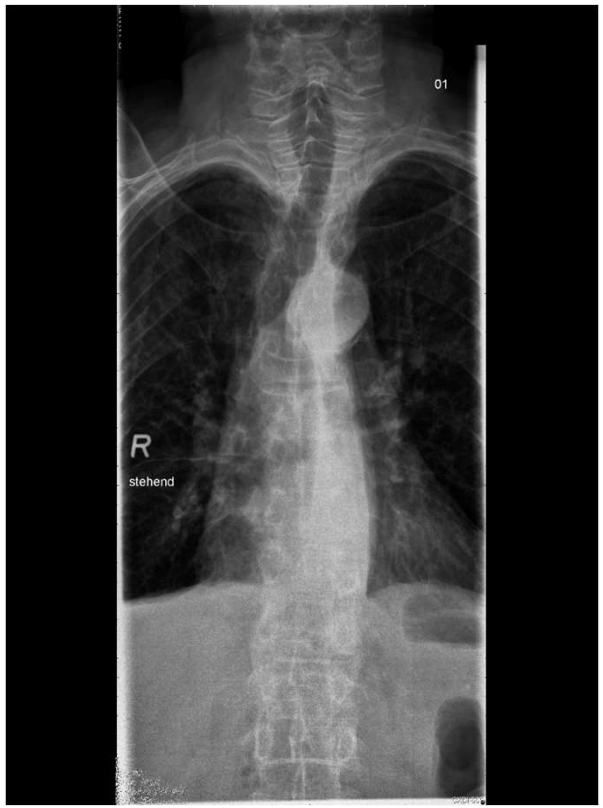

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Eisenberg (6th ed. Fig 4-41 and 4-42

Osteoporosis





Case courtesy of Dr Roberto Schubert, Radiopaedia.org,
rID: 18147

Osteomalacia

- Bone softening due to insufficient mineralization of an adult skeleton

- Calcium and phosphorus fail to be deposited in the bony matrix-due to lack of intake or failure of absorption of calcium, phosphorus or vitamin D

Osteomalacia

- Radiographically shows:
  - Diffuse demineralization, smudgy, fuzzy pattern



Rickets

- Similar to osteomalacia in adults, but occurs in children with vitamin D deficiency, unbalanced infant nutrition, lack of sun exposure

- Presents with skeletal changes, bowing of long bones and bone pain

Rickets





Case courtesy of Dr Angela Byrne, Radiopaedia.org, rID: 8116

Gout

- Build up of uric acid deposits inside joints, cartilage, and kidneys
- May be primary (inherited) or secondary
- Normally attacks a single joint (first MTP joint)
- Clumps of urate crystals form soft tissue swellings called gouty tophi
- Causes chronic inflammatory and destructive changes in surrounding connective tissue
- Radiographic appearances develop late in the disease: clumps of urate crystals that form along the articular cortex, erode bone, and cause small, punched-out defects known as “rat bite” erosions
- Treatment includes decreased dietary intake of red meats and uric-acid inhibitors

Gout



Case courtesy of Dr Aditya Shetty, Radiopaedia.org, rID: 26902


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Eisenberg (6th ed.) fig. 4-50 and 4-52



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Eisenberg (6th ed.) fig. 4-51

Gout

Title	Gout: Overview of X-ray Findings
Author	Dr Raj Carmona
Link	http://www.rheumtutor.com/xray-findings-in-gout-2/



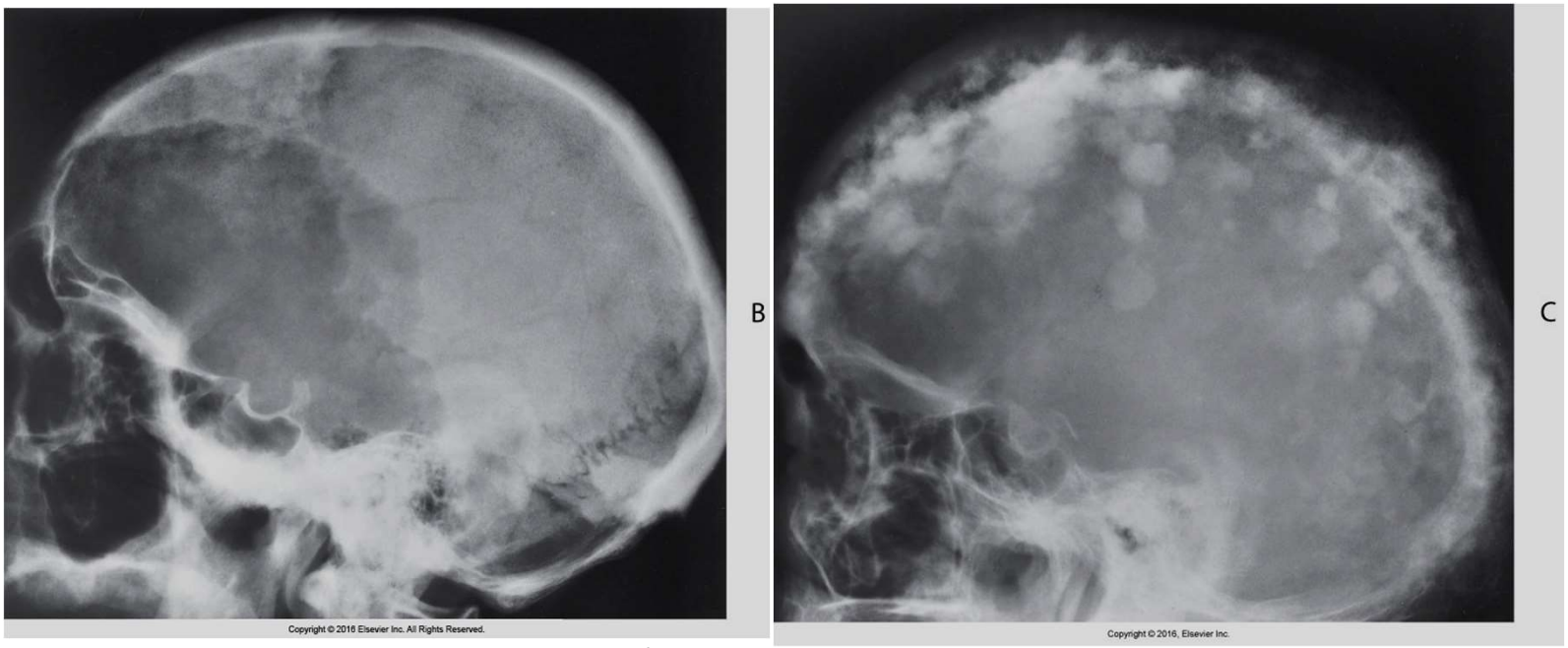




Paget's disease

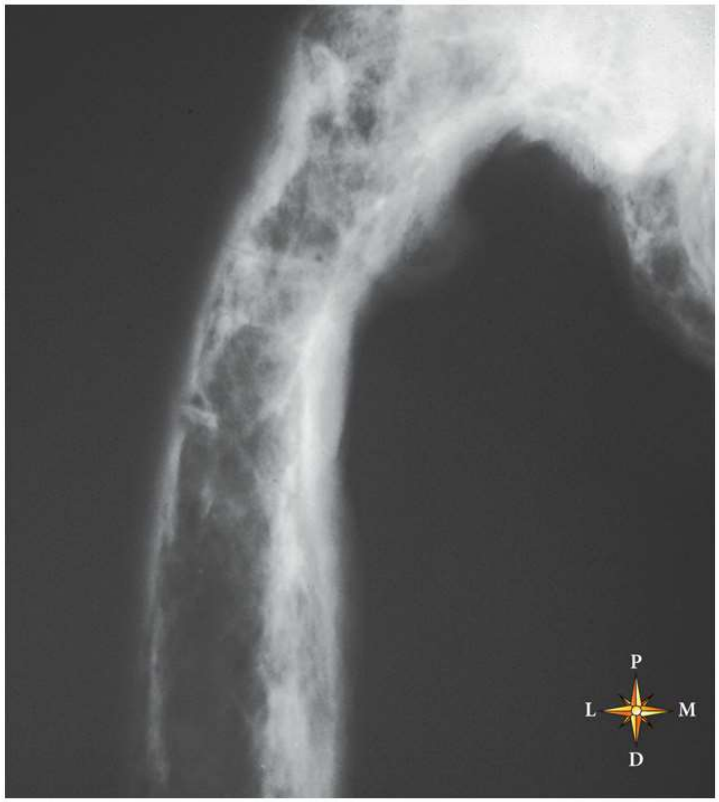
- Also known as osteitis deformans
- Excessive abnormal bone remodeling: destruction of bone (lytic phase), followed by reparative phase
- Pelvis, spine, skull and proximal long bones are most commonly affected

Pagets Disease



Eisenberg (6th ed) Fig 4-53:
* Destructive phase, lytic lesions
*Reparative phase that causes "cotton wool" sign

Pagets Disease



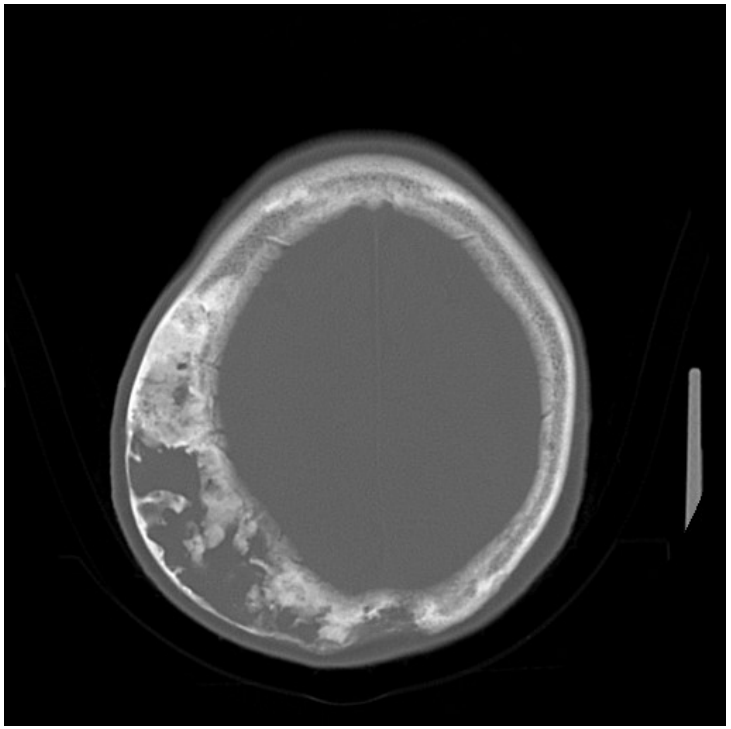
From Browner B, Jupiter J, Trafton P: *Skeletal trauma: basic science, management, and reconstruction*, ed 3, Philadelphia, 2003, Saunders.

Patton and Thibodeau (7th ed.) fig. 8-33

Paget's disease of the skull

- Case courtesy of Dr Roberto Schubert, Radiopaedia.org, rID: 23807





THANKS