

Bone & Joint pathology

Osteoporosis

Definition: ↓ mass of normally mineralized bone, (localized to one or a few bones or generalized)

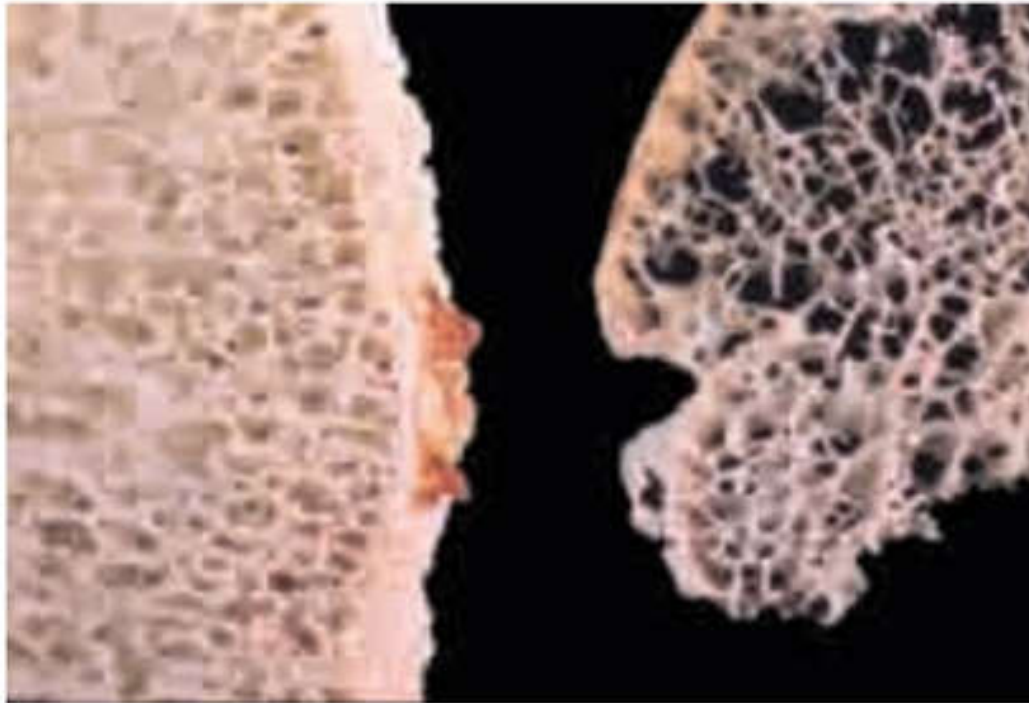
cause: multifactorial, the 2 most common forms:-

- 1- **senile osteoporosis** due to aging (osteoblast function)
- 2- **postmenopausal osteoporosis** due to ↑ osteoclast activity

Morphology: thinner & fewer bone trabeculae; thin cortex; widened Haversian systems

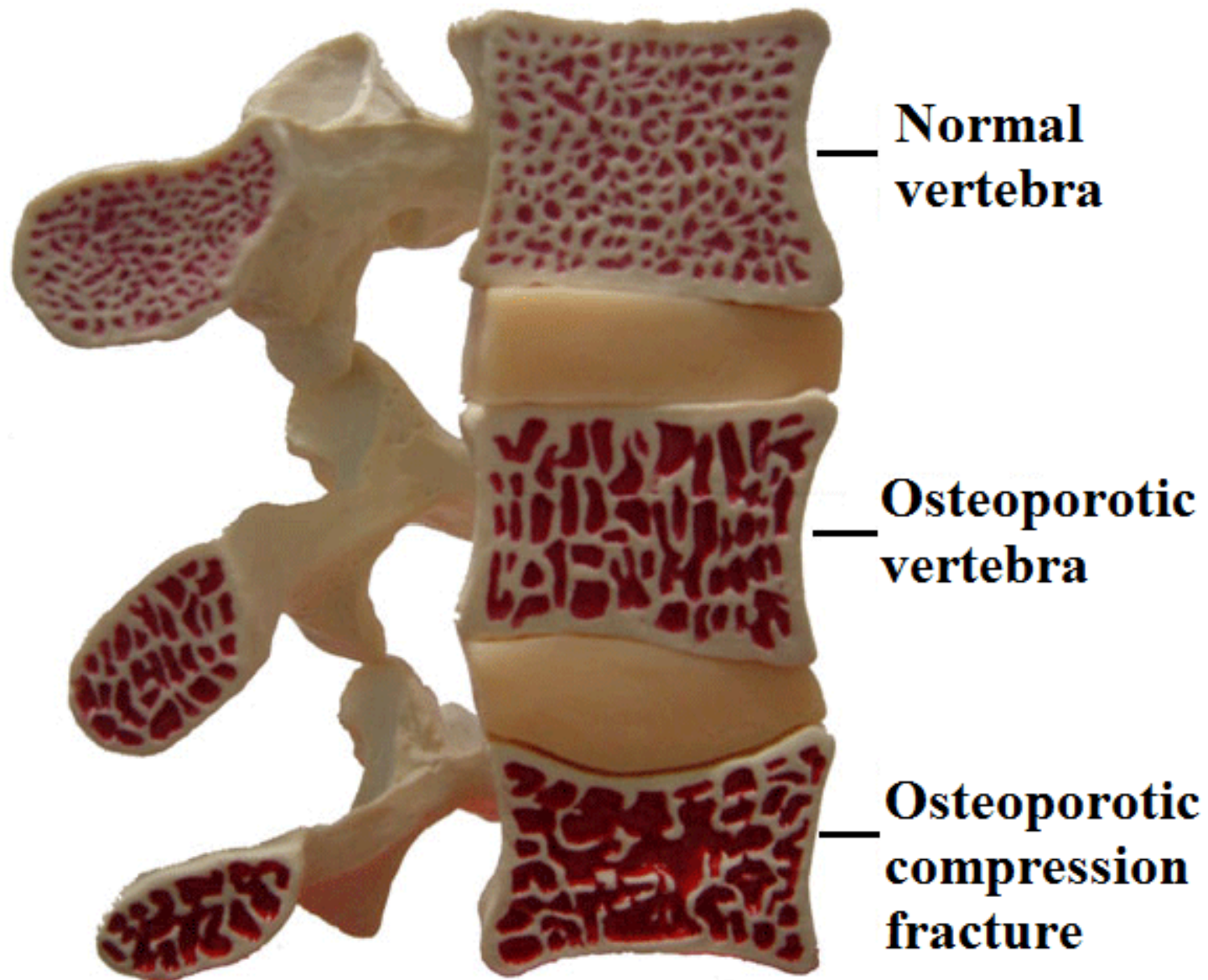
Clinical features:

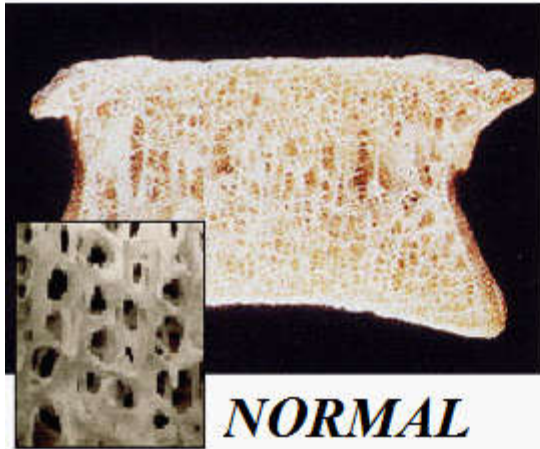
- **early** stages, osteoporosis is asymptomatic.
- **Later**, compression fractures of vertebrae, femoral head.



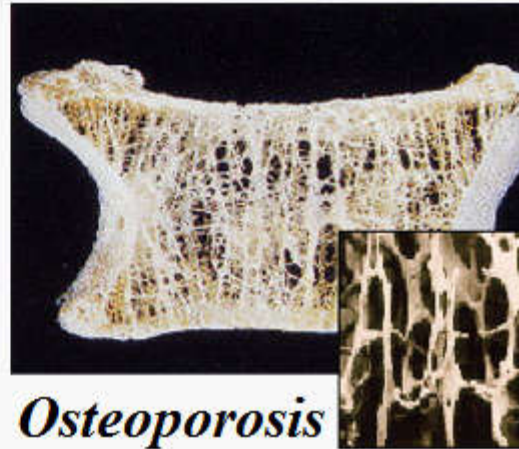
Osteoporosis. Femoral head of an 82-year-old woman with osteoporosis and a femoral neck fracture (*right*) compared with a normal control cut to the same thickness (*left*).







NORMAL



Osteoporosis



Rickets & Osteomalacia

Definition: bone diseases characterized by
↓ mineralization of newly formed bone.

Cause: vitamin D deficiency due to

- ↓ intake,
- ↓ sunlight exposure,
- ↓ absorption (pancreatic insufficiency, bowel dz)
- ↓ renal synthesis of 1,25(OH) D)

Pathophysiology:

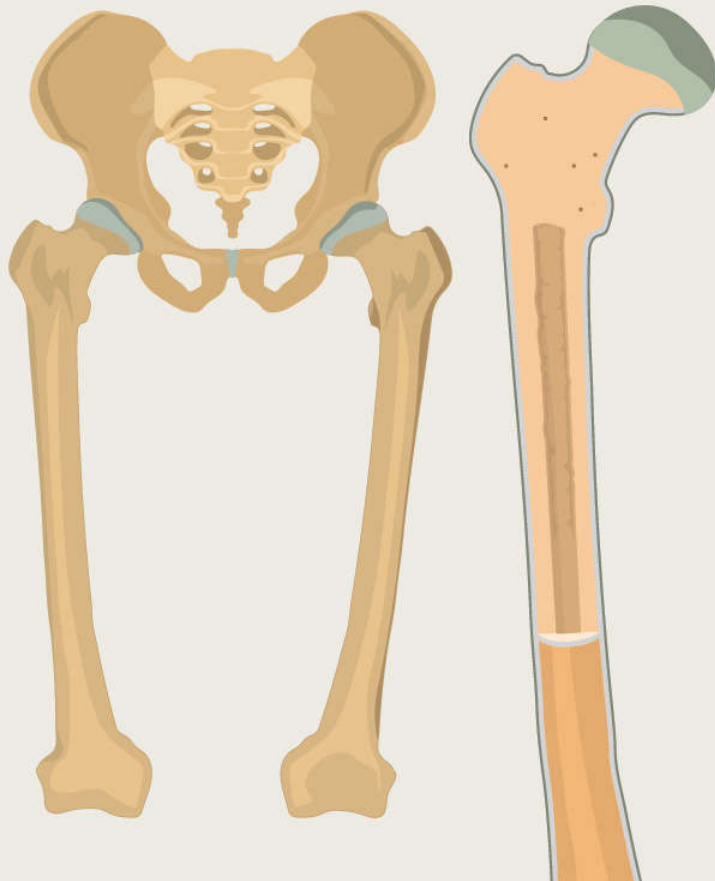
Vitamin D deficiency → ↓ Calcium absorption →
↓ calcification of osteoid matrix

Clinical features:

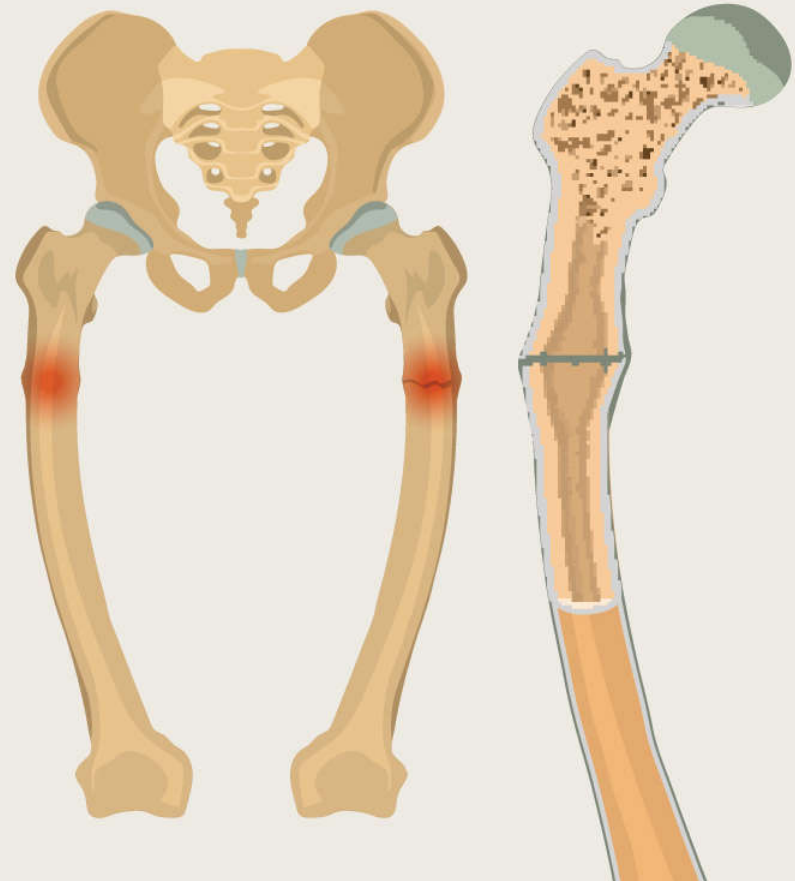
1- *Rickets* tends to present with skeletal deformities e.g. Bowing of legs.

2- *osteomalacia* tends to present with bone pain & fractures.

NORMAL BONES



RICKETS



Rickets



Rickets

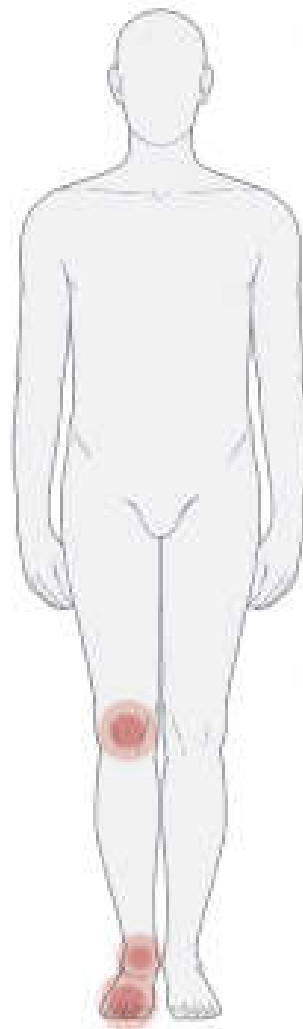




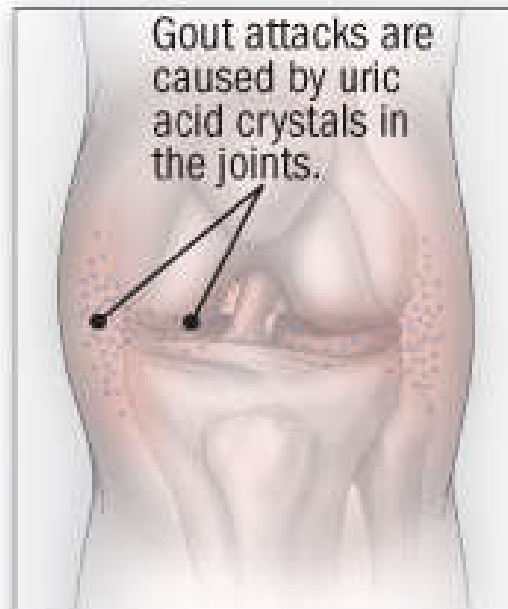
Gout

Key Points

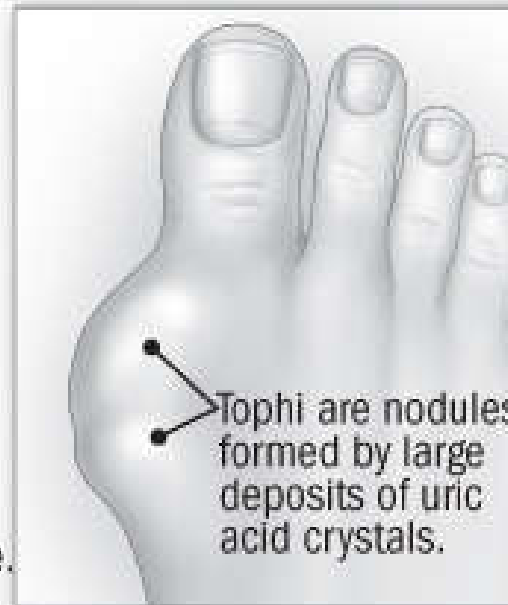
- Gout is caused by excess levels of uric acid.
 - There may be acute or chronic arthritis.
 - Crystals are identified on joint aspiration.
 - There is accumulation of urates in tissues to form deposits known as tophi.
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- ▶ Painful acute inflammatory response to tissue deposition of urate crystals
 - ▶ Most commonly affects metatarsophalangeal joint of first toe
 - ▶ Much more common in males than in females
 - ▶ Serum uric acid levels are raised
 - ▶ May be associated with chronic renal damage



Attacks of gout arthritis affect the knees, ankles, feet, and often the big toe.



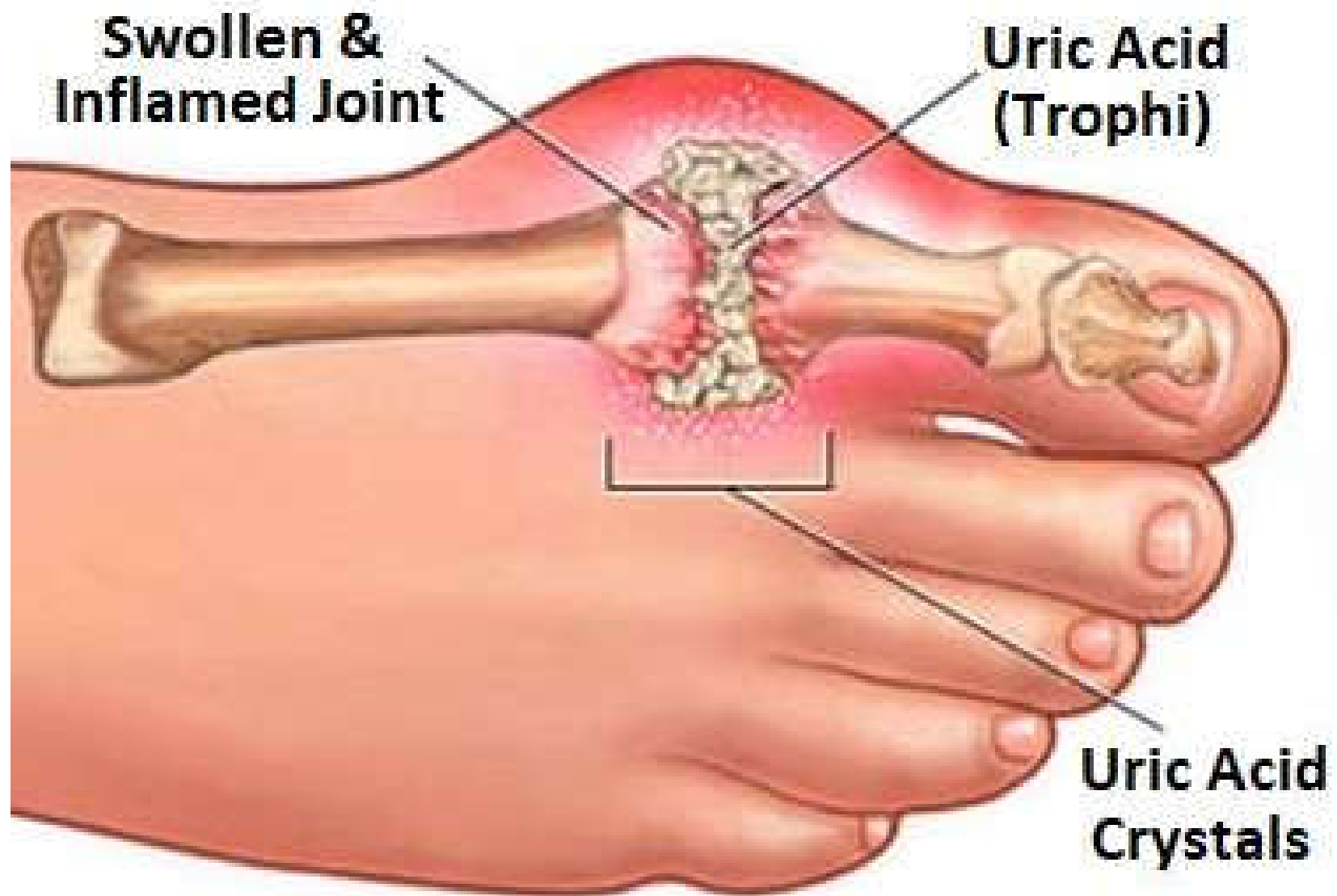
Gout attacks are caused by uric acid crystals in the joints.

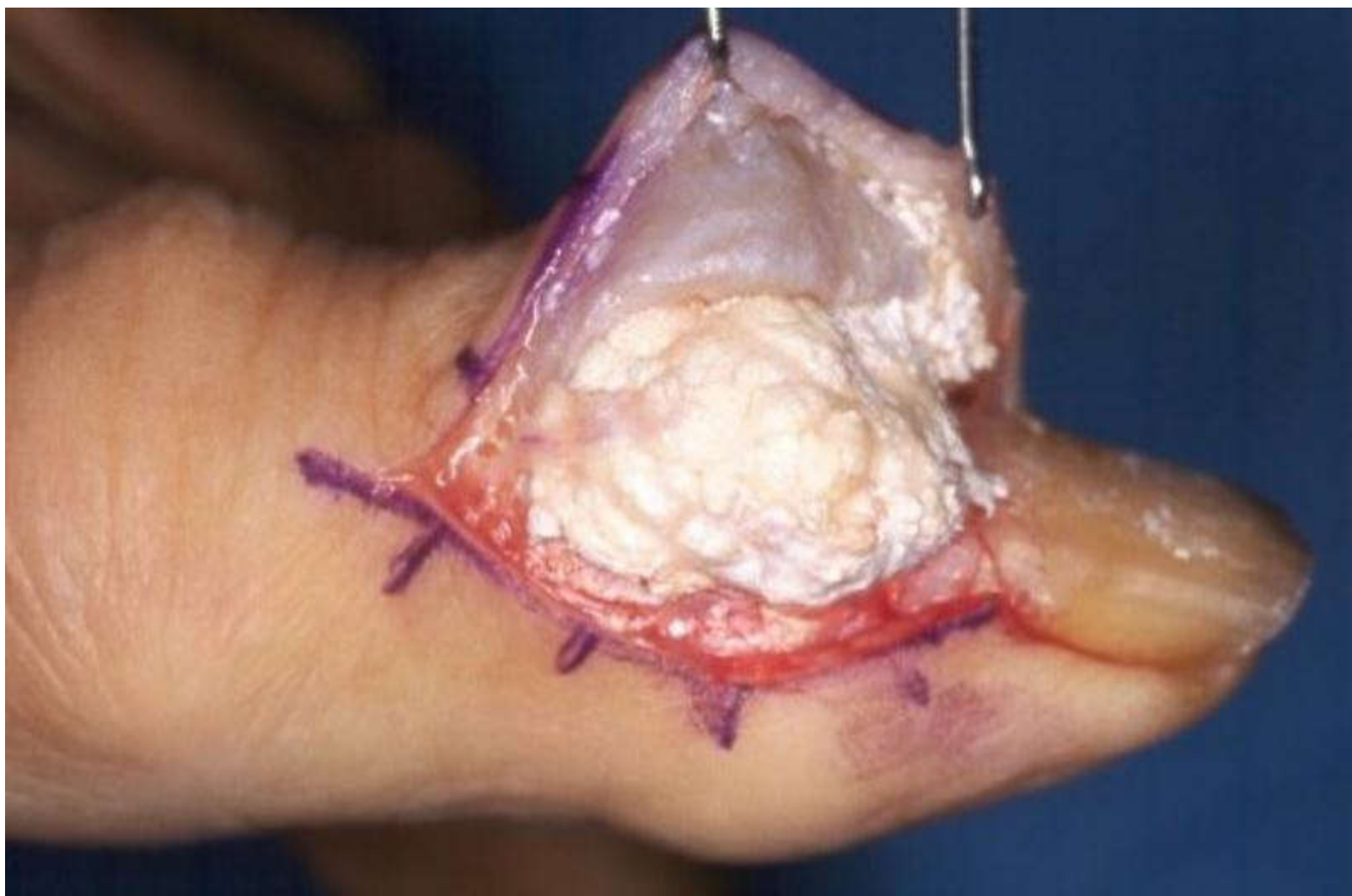


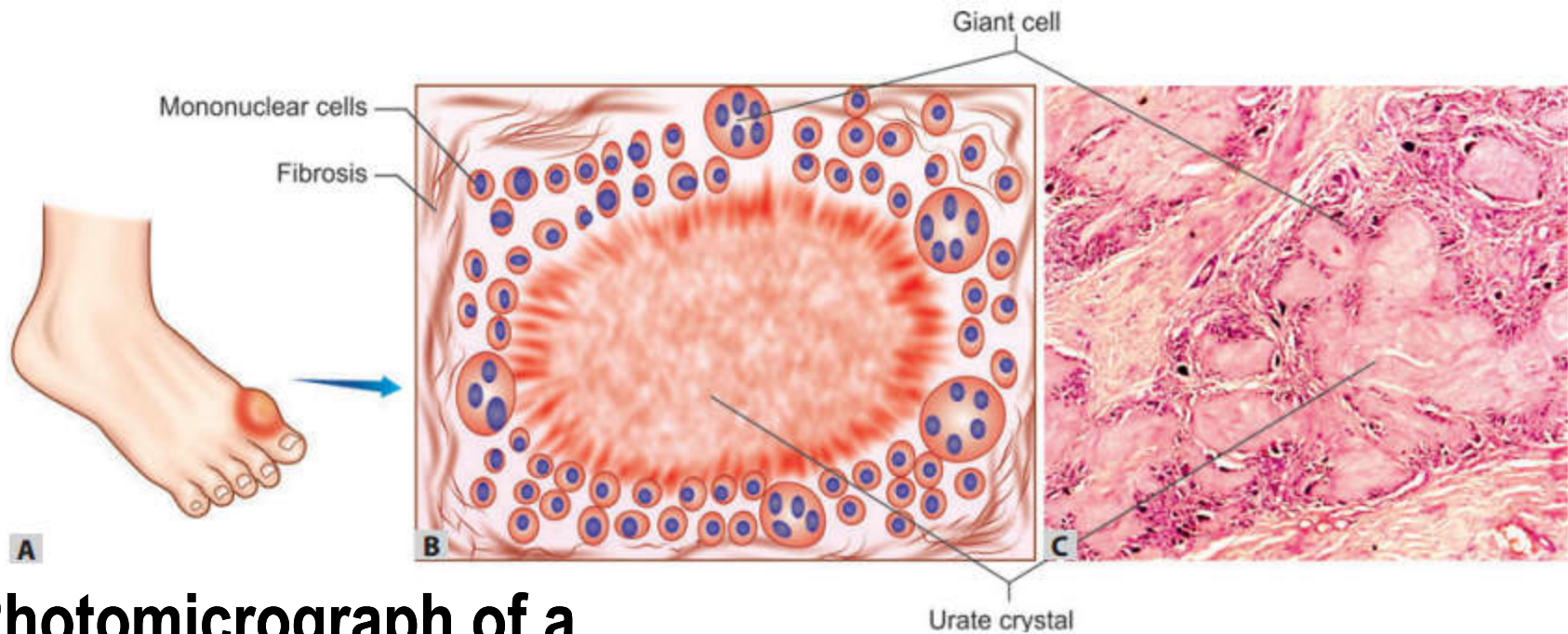
Tophi are nodules formed by large deposits of uric acid crystals.

Acute Gout

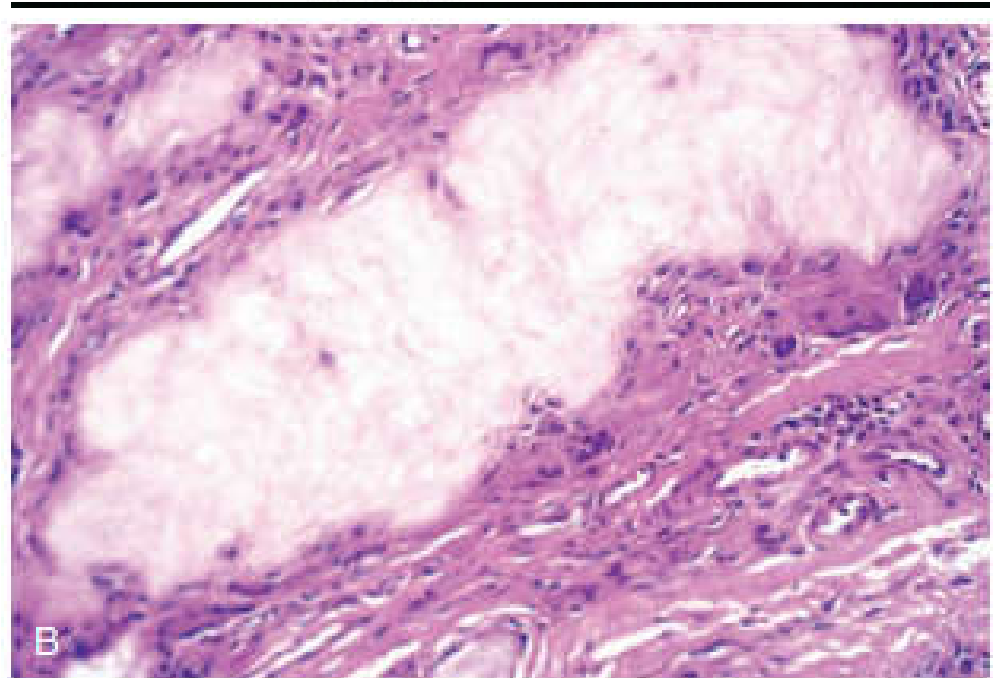








Photomicrograph of a gouty tophus. An aggregate of urate crystals is surrounded by reactive fibroblasts, macrophages, and giant cells.





Gout Knee

