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Introduction

- Osteitis deformans = Paget disease of the bone
- Accelerated bone remodeling results in deformity
- Second most common bone disease after osteoporosis
- 1% of white people over age 55
- Incidence increases with age
- Only 20% of cases are symptomatic; disease is often found incidentally on labs or X-ray
- Can be monostotic (one site) or polyostotic (multiple sites); polyostotic more common
- Most commonly affected sites:
 - pelvis
 - vertebrae
 - femur
 - humerus
 - skull
- Deep, aching pain of affected bones and neighboring joints, worse at night and with weight bearing
- Complications may include bone deformity, immobility, deafness, and paralysis
- Disease can recur after treatment

Pathogenesis

- Abnormal bone resorption and deposition
 - Osteolytic Phase - hyperactive osteoclasts increase resorption; remodeling increased up to 20x
 - Mixed Lytic-Blastic Phase - accelerated bone formation from compensatory osteoblastic activity
 - Sclerotic Phase - thick, disorganized bone, fracture-prone
- Abnormal bone can be highly vascular, causing hemorrhage during surgery or vascular steal syndromes
- Etiology is unknown
 - Triggered by viral infection
 - Genetic component
- Mutation in *SQSTM1* gene present in 35% of patients with familial variant (autosomal dominant with incomplete penetrance) and 7% of those with sporadic variant

Case Description

Case:

- 79 yo male with history of osteoarthritis treated with meloxicam and tramadol presents to family practice for follow-up on recent increase in joint pain following increase in physical activity
- 3 weeks prior, he started 12-day prednisone taper with cyclobenzaprine added nightly
- Inadequate pain response to treatment - continues to have generalized aching/throbbing joint/bone pain most bothersome at night

History:

- Denies constitutional ROS or recent infection
- PMH - History of fractures, Gout, OA requiring chronic NSAID use, Paget's disease in remission since 2016
- Surgical Hx - Cholecystectomy 2011
- Social Hx - Widowed veteran, patient continues "handyman" work that includes ladder climbing for financial hardship

Physical Exam:

- Afebrile, BMI stable at 26.9
- MSK exam:
 - Bowed lower left leg with varus deformity, antalgic, uneven gait
 - TTP over right greater trochanteric bursa, limited abduction of left shoulder
 - Diffuse, gouty tophi over knees, elbows, wrists, and hands, limiting grip and ROM

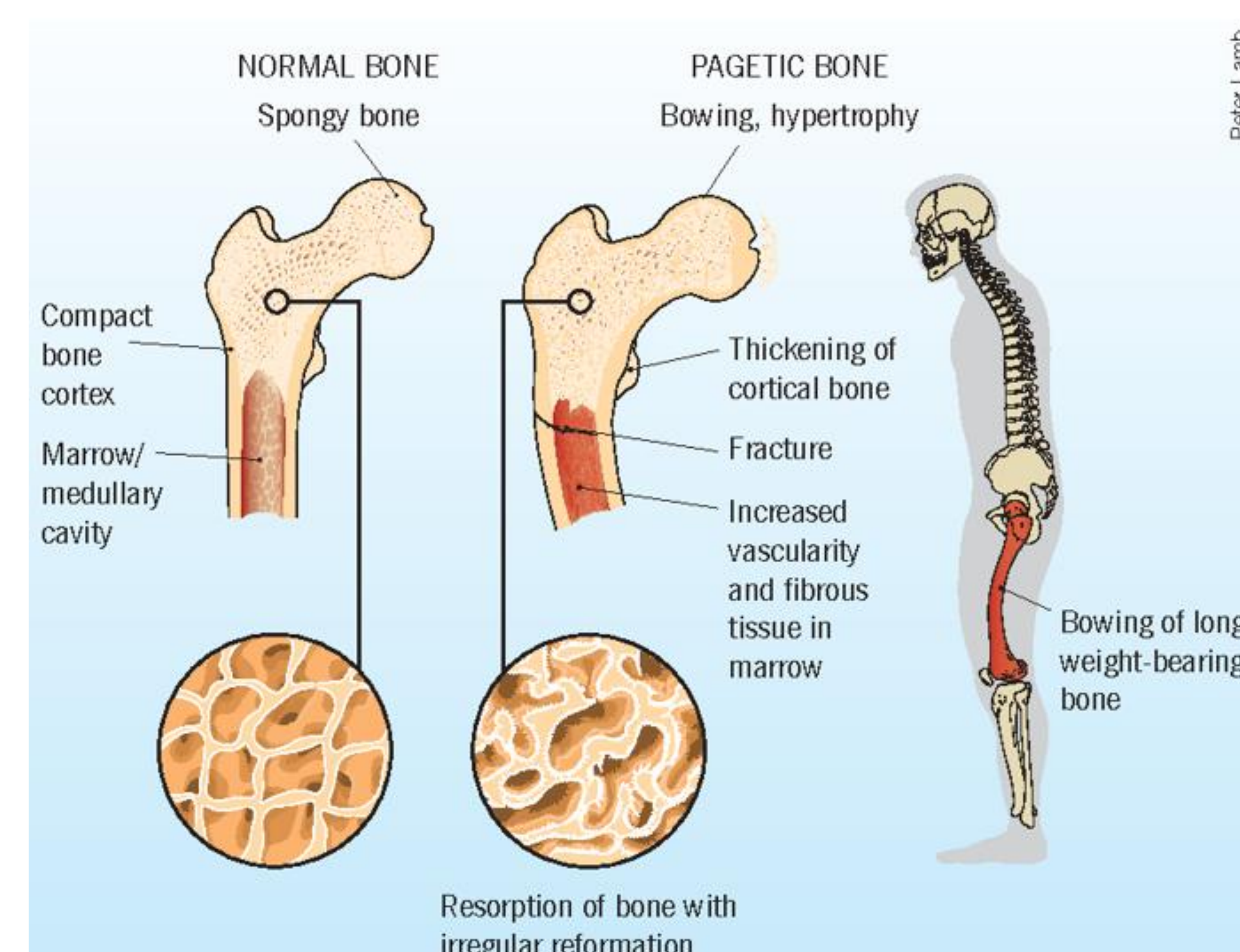


Figure 1. Normal bone compared with Pagetic bone. Lamellar bone architecture gives way to disorganized, fragile bone, histologically described as "woven" or "mosaic."⁵

Diagnostic Workup:

- CMP, CBC, CRP, TSH, Uric Acid
- Plain film of pelvis and left leg

Table 1. Laboratory data.

Sodium	138	AST	30
Potassium	5.0	ALT	35
BUN	42 (H)	ALP	218 (H)
SCr	2.35 (H)	T.Bili	0.4

- eGFR **27 ml/min (L)** (Normal = 90+)
- Calcium 9.2 (Normal 8.7-10.2)
- WBC 6.7, HGB 11.0, HCT 34.9, PLT 245
- TSH 2.30 (Normal 0.5 - 5)
- CRP **28.7 (H)** (Normal <8)
- Uric Acid **10.1 (H)** (Normal 4-8)

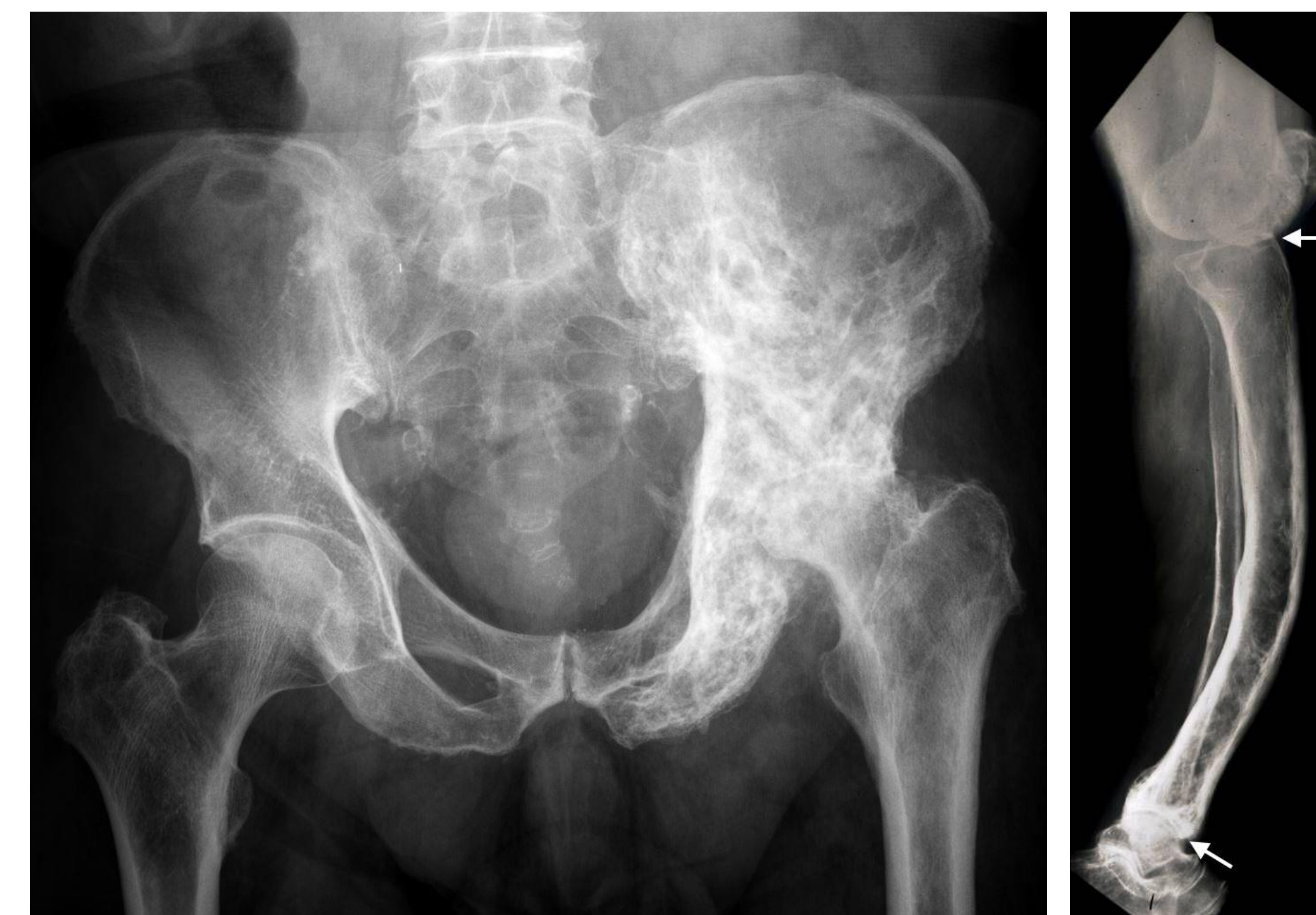


Figure 2. Characteristic lytic lesions of pelvis and cortical thickening of tibia. Affected innominate has "cotton wool" appearance due to abnormal bone deposition. Other characteristic findings include "picture frame" appearance of vertebrae and "blade of grass" appearance of long bones due to cortical thickening.³

Treatment Plan:

- Zoledronic acid (Reclast) is 1st line treatment
- Zoledronic acid was contraindicated in this patient with CrCl < 35 mL/min
- Treated with alendronate (Fosamax) 40 mg PO daily, calcium, and vitamin D₃
- Stopped meloxicam
- Recommended acetaminophen to decrease first-dose effect

Outcome & Follow Up

At 1 month follow up:

- AlkPhos reduced from 218 to 106 U/L (Normal 23-144)
- Patient reported pain was improved
- Clinician provided medical letter supporting increase of patient's VA disability benefit as his continued employment for financial hardship poses a danger for fracture or worse
- Result of disability benefit hearing still pending

Learning Points

- Suspect osteitis deformans in cases of elevated alkaline phosphatase in the absence of hepatobiliary disease
- Once treated, monitor for recurrence with serum alkaline phosphatase at least 1x/year. First-line zoledronic acid has a 12.5% recurrence rate at 6.5 years; rate is significantly higher for other therapies
- Radiography will show lytic lesions, possibly in multiple sites
- Assess vitamin D and calcium levels prior to beginning treatment
- Risks and benefits should be weighed in patients with decreased renal function

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