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Differential diagnosis

- ◆ Parathyroid adenoma
- ◆ Familial hypocalciuric hypercalcemia
- ◆ Malignancy
 - ◆ Squamous cell lung cancer
 - ◆ Bone metastases
- ◆ Sarcoidosis or other granulomatous diseases
- ◆ Drug effects (esp. thiazides, lithium)
- ◆ Lab error

Parathyroid Hormone (PTH)

- ◆ Normally, released by the parathyroids in response to *low* serum calcium. The overall effect is an increase in serum calcium and a decrease in serum phosphate.
- ◆ Effects:
 - ◆ 1. Increases the activity of osteoclasts, demineralizing bone and releasing calcium into the serum
 - ◆ 2. Increases the conversion of 25(OH)-Vitamin D to 1,25(OH)₂-Vitamin D
 - ◆ This increases small bowel absorption of calcium and phosphate
 - ◆ 3. Increases calcium reabsorption in the kidneys
 - ◆ 4. Decreases phosphate reabsorption in the kidneys
- ◆ Net effect: *Increase in serum calcium*, decrease in serum phosphate

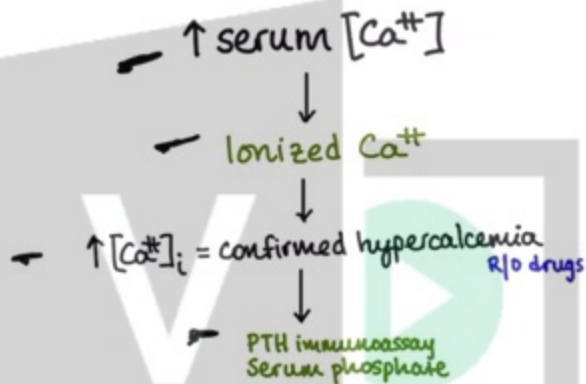
Ca⁺⁺

PTH

Vignette

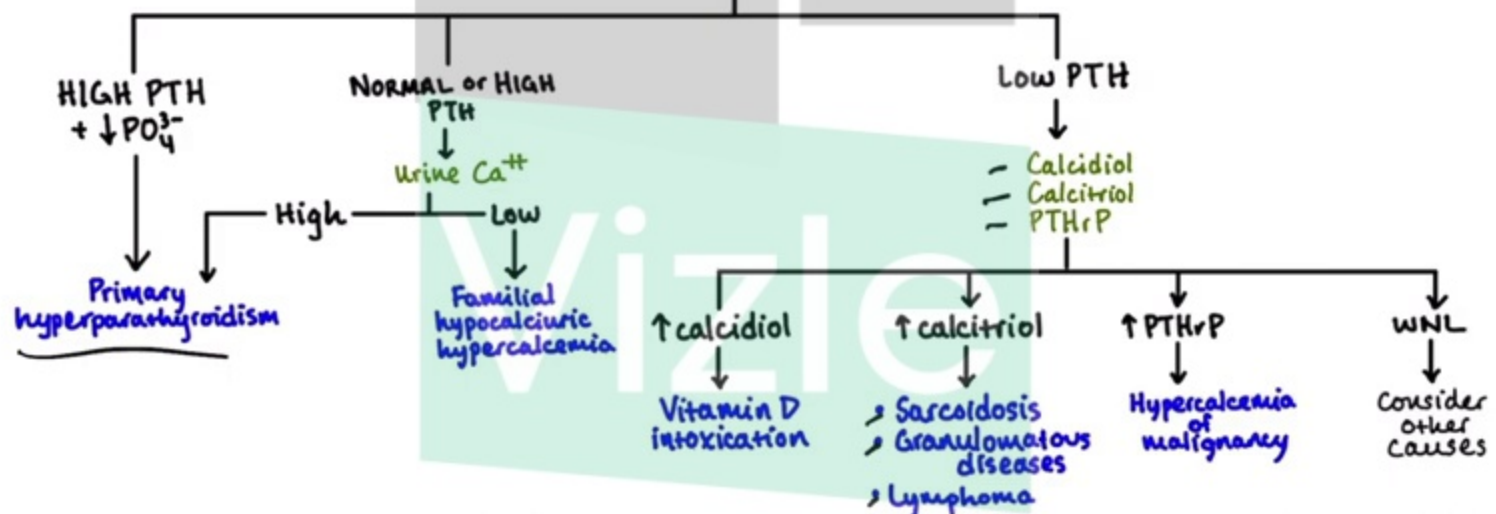
- ◆ 33 y/o woman with currently asymptomatic hypercalcemia. Elevated plasma calcium, elevated urine calcium, normal CXR.
- ◆ Presumptive diagnosis: Primary hyperparathyroidism
- ◆ Further testing:
 - ◆ Serum parathyroid hormone: 25 mEq/mL (normal: 4-9 mEq/L)
 - ◆ Sestamibi scan: Increased uptake in left inferior parathyroid gland
- ◆ Definitive management
 - ◆ Referral to surgery for parathyroid adomectomy

HYPERCALCEMIA



* Serum $Ca^{++} > 10.3 \text{ mg/dL}$
 * Sx: STONES (nephrolithiasis)
 BONES (bone pain, frx)
 GROWS (abd. pain, constipation, nausea)
 Psychiatric overtones (lethargy, tremor, Ψ)
 * May be ASX

Initial orders
 • BMP
 • Serum ionized Ca^{++}
 • Serum PO_4
 • Urine Ca^{++}
 • PTH +/- CXR





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