HYPERPARATHYROIDISM:

Cause/Treatment:


Confirm diagnosis with elevated INTACT (whole molecule) parathyroid hormone test and simultaneous elevated calcium level. (May need to check a 24 hour urine for calcium excretion to rule out familial hypocalciuric hypercalcemia, a benign disease that needs no treatment.) Sestamibi parathyroid scan is useful to identify the location of the abnormal gland.

TX: When? Consider if symptomatic, osteoporotic, or calcium over 11.5-12.0, or younger patient without any overt symptoms. Only approved treatment is parathyroidectomy. KUB, DXA, 24 hour urine calcium, parathyroid scan, but need an experienced surgeon who does this regularly. Intra-operative PTH level. Watch for post-op hypocalcemia—“hungry bones” and suppression of remaining normal parathyroids for 4-7 days.

?surgery for asymptomatic patients; Treatment of low bone mineral density.

2. Causes and treatment of secondary hyperparathyroidism:
   a. Low calcium. TX: Replace calcium.
   b. Low phosphorous. TX: Replace phosphorous.
   c. Chronic renal failure may cause decreased 1,25-vitamin D causing decreased calcium and may lead to renal osteodystrophy with osteitis fibrosa cystica. TX: calcium and 1,25-vitamin D (Rocaltrol) or parathyroidectomy.
   d. Osteomalacia/rickets secondary to vitamin D deficiency. TX: Vitamin D and calcium.

HYPERCALCEMIA- other causes. These generally cause LOW intact PTH levels. (Tx includes treating underlying disease process or cause):

1. Vitamin D excess (absorptive).
2. Malignancy—either metastases to bone or release of PTH-related peptide. Less common, ectopic PTH production.
3. Granulomatous disease (TB, sarcoid, etc.).
4. Thyrotoxicosis.
5. Immobilization.
6. Adrenal insufficiency.
7. Thiazide diuretics.
8. Milk-Alkali Syndrome.
9. Familial hypocalciuric hypercalcemia- no treatment necessary. PTH level is usually normal or slightly high.

HYPERCALCEMIC EMERGENCIES TREATMENT:
1. Saline diuresis.
2. Loop diuretic.
3. Pamidronate (Aredia) 60 mg IV over 4 hours or 90 mg IV over 24 hours.
4. Zoledronic acid (Zometa) 4 mg IV over 15 minutes.
5. Glucocorticoids.
6. Calcitonin.

HYPOCALCEMIA CAUSE AND TREATMENT:
Hypoparathyroidism- idiopathic; post-surgical; autoimmune polyglandular syndrome (with candidiasis); adrenal insufficiency; calcium or vitamin D deficiency (malabsorption or malnutrition); renal failure; total lack of sun exposure.

Vitamin D deficiency is much more common than previously recognized. 25-hydroxy Vitamin D level should be 32 or higher. Vitamin D deficiency implicated in autoimmune disease, cancer, etc. (M. Holick)

Supplementation with vitamin D should probably be at least 1,000-2,000 IU daily.

Alternatively, 50,000 IU vitamin D every 2-4 weeks.

EMERGENCY TREATMENT OF HYPOCALCEMIA:
Calcium IV and Calcitriol (Rocaltrol).

OSTEOPOROSIS
DXA bone density: T-score -1 to -2.5: osteopenia
T-score -2.5 or worse: osteoporosis

TX:
Bisphosphonates: inhibit osteoclastic resorption.
Alendronate (Fosamax): 35 or 70 mg weekly or 5 or 10 mg daily
Residronate (Actonel): 35 mg weekly 150mg once monthly
Ibandronate (Boniva): 150 mg once monthly (or Boniva can be given IV every 3 months)
Zoledronic acid (Reclast) 5 mg IV yearly
DENOSUMAB (PROLIA): RANK-LIGAND INHIBITOR

ESTROGEN

EVISTA

CALCITONIN

CALCIUM

VITAMIN D

Forteo-(1-34 teriparatide) increases **osteoblastic bone formation**; Given subcutaneously daily for two years

**MULTIPLE ENDOCRINE NEOPLASIA**

Type 1 (Wermer): Parathyroid hyperplasia, pancreatic tumors, pituitary adenomas.

Type 2A (Sipple): Medullary thyroid carcinoma, pheochromocytoma, sometimes associated with parathyroid hyperplasia.

**CASE:**

74 year old thin Caucasian female with hip fracture and calcium level 11.0 with normal albumin. Smoker. Calcium level was 10.6 one year ago. Most likely differential dx: Malignancy with bone metastases; cancer (lung) with PTH-related peptide; primary hyperparathyroidism; Next blood test: intact PTH. If high, primary hyperparathyroidism most likely. If PTH level low, malignancy more likely. Tx: if primary hyperparathyroidism: strongly consider neck exploration. If malignancy, treat underlying cancer. If not surgical candidate or refuse surgery, observe calcium level 3-4 times yearly, avoid dehydration, consider bone densitometry, etc. (If calcium was 15.0, then malignancy is likely, especially if a calcium level one year ago was normal. Temporizing treatment could also include pamidronate or gallium, saline infusion with loop diuretic.)