A Trip Over the Dog

Gayle Frazzetta, MD, FAAFP, CCD
Associate Clinical Professor,
University of Colorado, School of Medicine
• LT 73y/o female referred for treatment of non healing Lt surgical neck humerus fracture. Tripped over dog, landed on her elbow.
• **PMH:** osteoarthritis, gastroesophageal reflux, overweight, dry eye, hypertension, asthma, insomnia, CKD-3, obstructive sleep apnea, urge incontinence, dyphagia, restless leg syndrome
• **PSH:** B total knee arthroplasty, total abdominal hysterectomy-age 45, cervical fusion syndrome, Lt rotator cuff repair, uvulopharyngoplasty, anterior vagina wall repair
• **Meds:** ibrersartan 300mg, HCTZ 50mg, meloxicam 15mg, aspirin 81mg, amlodipine 10mg, montelukast 10mg, pramipexole 0.125mg, pantoprazole 40mg, symbicort, C-PAP with O2
• **Supplements:** Vit D 1000IU qd, calcium 400mg tid
• **DXA:** 14 months prior to fracture, T scores: Total Hip -0.9, L1-4 1.5, 8 months after fracture, T scores: Total Hip -0.7, L1-4 1.3
• **PE:** wt 178#, 68”,BMI 28, self ambulatory, no kyphosis, central obesity, first metatarsal joints with lateral drift, mild tenderness, no erythema
• **Labs:** Vit D 40, GFR 54, normal CMP & CBC
Surgical Neck Humerus Fx

- Minimally displaced
- Sling & PT
- Non healing at 3 months so bone stimulator initiated
- Non healing at 5 months so open reduction and internal fixation was performed
3 months post op (7 months post fx)

- Non healing, documented by plain films and CT scan
- Referral made for evaluation
2 months after treatment initiation

- Less pain
- Improved function
- PT advanced
Clinical Question

• What further work up is recommended?
• Why did a person with average bone density sustain this significant fracture with relatively low impact?
• What treatment options are available, both FDA and non FDA approved?
Elevated Alkaline Phosphatase

LAURA SCHMIDT, NP-C

ADVANCED BONE AND JOINT
BONE HEALTH CLINIC
ST. PETERS, MO
History:

- 71 post-menopausal female: 5’6”, 120 lbs
  - Epilepsy, 1969 (last seizure 1984), Rheumatoid arthritis, high cholesterol, chronic stable mild anemia, hypothyroidism
  - Menopause 35 y.o
  - Prior smoker, quit 12-14 years ago
  - Patient reports "Junk diet"

- Fracture history- 5 fractures after age 50:
  - June 2022- Right distal radius fx- walking dog, tripped, casted
  - March 2022- Left rib fxs X 2, fell off toilet and hip tub
  - September 2021- Right distal radius fx- fell off chair at work, casted
  - 2016- Right ankle fx- fall from 1 step, ORIF
Medication History

- Current medications
  - Solfoton (phenobarbital)
  - Dilantin (phenytoin)
  - Levothyroxine
  - Meloxicam
  - Caltrate: 600 mg calcium/800 IU Vit D3

- Prior medications:
  - Methotrexate: stopped in 2021 d/t side effects (alopecia), was on 6-7 years
  - Fosamax in the 1990’s for 3-4 years
Labs/Bone Density

- Labs 6/21/22: Alk phos 240 (44-121), Phosphorus 4.0, Intact PTH 20, BSAP 30.5 (8.1-31.6), Kidney function normal, bilirubin and liver enzymes normal.
  - Prior labs from PCP:
    - Alk phos: 173 in 3/22; 147 in 10/21, 124 in 2/21
    - 25-OH Vit D: 3/29/2022: 40.7
- Bone Density 10/14/2021
  - L-spine 0.709 gm.cm2, T-score -3.9
  - Left Femoral Neck 0.674 gm/cm2, T-score -2.6
  - Right Femoral Neck 0.767 gm/cm2, T-score -2.6
New Orders/Updates

- Labs/Orders:
  - Bone scan
  - Bone markers: CTX, P1NP
  - Repeat CMP
  - SPEP
  - Review labs from hospitalization

- Updates:
  - Patient is currently in hospital diagnosed with Guillain-Barre syndrome.
  - Unknown cause. She cannot walk or use her arms.
  - CT scan of abdomen in hospital: mild dilation of the common bile duct.
Clinical Question

What is the cause of her elevated alkaline phosphatase with normal BSAP, Vit D, phosphorus, calcium and Intact PTH?

- Osteomalacia, no
- Osteoporosis is a high bone turnover state
- Epilepsy and long-term use of anticonvulsants
- Rheumatoid arthritis
- Recent fracture
- Metastatic disease
- Paget’s Disease
- Hepatobiliary findings: mild dilation of CBD

Any thoughts, other causes or a combination of several above?
Severe Osteoporosis, Complicated Patient, What is Going On, What to Do?

Patricia Kapsner MD
UNM HSC Division Endocrinology, Diabetes and Metabolism
Hx


• Meds: metformin, insulin, exenatide, losartan, metoprolol, rosvuastatin, furosemide, topiramate, mirtazapine, Vit D 4000 IU/d, Ca Carb 500mg bid and rare use of steroid nose drops

• FHX neg for osteoporosis, kidney stones, fractures, endocrine ds

• 2019 DEXA osteopenia. FRAX hip 3.9%, major osteoporotic Fx 16%. Declined tx.
Prev eval:

2019
1 mg ONDST x2: 8am cortisol 4, 9 mcg/dl with adequate Dex levels
LNSC: 1/3 elevated 0.117 mcg/dl (nl < 0.112)
CMP: normal
A1C: 5.8
ACTH post Dex: 6, 9 pg/ml
DHEAS 21 mcg/dl (29-220)
Vit D: 37 ng/ml
TFT’s: nl

CTA 2017: enlarged adrenals bilat, no nodules

2021: Ca 9.9, 10.5 mg/dl (ULN 10.4), alb 3.8 mg/dl, Vit D 25 ng/ml, ionized Ca 1.19 mmoL/L (ULN 1.27). Increased dose Vit D
2021-2022

• 1 mg ONDST 8am cortisol 3.4 mcg/dl adequate dex level, ACTH 5 pg/ml
• Ca for PTH 9.9 mg/dl PTH 54 pg/ml, Vit D 45 ng/ml, alb 3.8 g/dl
• Dx: Cushing’s ?etio. W/U in progress
• repeat ACTH , DHEAS imaging pnd

DEXA BMD and TBS 2021

T Scores
L1-L2, L4* -0.4
Femoral Neck -3.0
Total Hip -0.3
TBS L1-4. -5.0
*L3 asymmetric BMD
• Rx abaloparatide, PA required and submitted, insurance denied
• 1/2022-10 days after insurance denied rx, sustained complicated hip fx after twisting, hearing a pop and falling in kitchen
• 4/2022 Re-prescribed abaloparatide and approved by insurance
• Ionized calcium 1.40, 1.42 mmol/L (ULN 1.27),
• Repeat Ca 9.9 mg/dl, alb 3.8 g/dl, PTH 44 ng/mL, nl renal function
• Kappa/Lambda, SPEP, CMP nl, A1c 6.2
• Celiac screen negative
• TFT’s nl
• Unable to collect 24 hr urine
• Parathyroid scan pending (wants all imaging, studies, interventions done now as has met insurance deductible with her hip fx)
Questions

1. Does this patient have primary hyperparathyroidism in addition to Cushing’s? MEN?

2. Can her fracture in 1/2022 account for her inappropriately non-suppressed parathyroid hormone in the setting of elevated ionized calcium's although she had 1 total calcium elevated prior?

3. While awaiting further evaluation and definitive tx for Cushing’s, ? hyperparathyroidism would you treat with abaloparatide or consider romosozumab?
Unexplained Acquired Hypercalcemia

Joseph B Hawkins, Jr, MD, FACE
Sierra Endocrine Associates
Fresno California
Disclosures

• Promotional Speaker
  • Amgen
  • Astra Zeneca
  • Novo Nordisk
The Case
• Currently a 59 yo Caucasian female
• Long history of normal calcium measurements prior to 2015
• Beginning in 2015 – hypercalcemia – gradually progressive

• Past Medical history
  • G2 P2 A0 (90, 93)
  • Hypertension, 1990
  • TAH 1997
  • Hypothyroid 2014
  • Migraine Headaches
CC 59 YO F

- July 2015 – Left breast cancer ER Positive
  - Lumpectomy followed by 6 weeks XRT to chest and axilla, No Chemo
- Aromatase inhibitor Dec 2015 to Dec 2020

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CC 59 YO F

- Oct 2021 – Hypercalcemia Noticed by PCP
- April 2022 First visit to see me
- Ht – 67” Wt 187 Lbs BMI 29
- Alk Phos 68, TSH 1.8
- Magnesium 2.3
- 24 hour Calcium
  - 347 mg /24 hours
- CBC – H/H 15.0/45.6
  - WBC 6.2

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CC 59 YO F

- 2015 BMD – Normal
- 2018 BMD
  - LS T-score 0.0 (decreased 4.8%)
  - Right Hip TS -0.7 (decreased 5.5%)
  - Left Hip TS -0.9 (Decreased 13%)
- 2021 06 PET CT Skull to mid thigh
  - No abnormal FDG uptake Head, Neck, Thorax, Abdomen or pelvis
- 2021 08 – Fracture in foot after trauma – no nondisplaced proximal phalanx 5th toe
- 2022 07 Chest X-ray – Normal

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Albumin 4.4 / Corrected Calcium 11.0
Ionized Calcium = 6.0 (increased)
Acth – 16, Cortisol 14
Crp = 1.1
Ctx = 620 // P1NP 50
1,25 (OH)2 D3 = 77 (nl 18-72)
ANCA - negative
Protein Electrophoresis = No pattern no abnormal spike
PTHrP = PENDING
CC 59 YO F

Current Medications
• Aspirin 81 mg daily
• Rosuvastatin 20 daily
• Fenofibrate 160 daily
• Omega-3 2 grams daily
• Inderal LA 120 daily
• Imitrex 100 prn
• Topamax 100 -2 x Day
• Phentermine 37.5
• Synthroid 125 mcg daily
• D3 5,000 iu daily

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She feels well – asymptomatic except for periodic migraine headaches
Question

• What is the cause of hypercalcemia?
• What further diagnostic testing is recommended?
• Any treatment recommendations?
Causes of Hypercalcemia

- PTH Dependent
- Cancer
  - Humoral hypercalcemia of malignancy
  - Local Osteolytic hypercalcemia
  - 1,25 Vitamin D (lymphoma)
  - Ectopic OTH
- Granulomatous disorders
- Endocrine disorders
- Immobilization
- Milk Alkali Syndrome
- TPN
- Abnormal Protein binding
- Chronic and Acute Renal Failure
- End stage liver disease
- Manganese intoxication
- Fibrin Glue
- Hypophosphatemia

- Medications
  - Vitamin D and or Analogues
  - Thiazide diuretics
  - Vitamin A
  - Lithium
  - Parathyroid hormone
  - Estrogen / SERMS
  - Aminophylline and or theophylline
  - Foscarnet
  - Growth Hormone
  - 8-chloro-cyclic AMP