**HYPERCALCEMIA, PARATHYROID HORMONE "UNRELATED" PROTEIN, & A "FAINT" MONOClonAL GAMMOPATHY; WHEN LABS GO AWRY**

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**PROBLEM:**
A 72-year-old female with past medical history of hyperparathyroidism, osteoporosis, type 2 diabetes mellitus, and recently diagnosed breast cancer presents as a follow-up of progressive right hip pain and secondary neck pain.

**ABNORMAL LABS NOTED TO INCLUDE:**
- Hypercalcemia 12.9
- PTH 15.6 pg/mL
- BUN 9.4 mg/dL
- Creatinine 1.3 mg/dL
- Calcium 11.9 mg/dL
- Immunofixation electrophoresis labs show Monoclonal Gammopathy
- 24 h urine protein electrophoresis: Trace of monoclonal protein bands and monoclonal protein

**BACKGROUND:**
- 5.4 years ago had a 2-year process of right hip pain.
- Tumor questionable 2x daily over the course of the last 1-2 months.
- Lacks 1200 mg calcium supplementation.
- For her PTH, she takes proton pump inhibitors.
- On review of previous labs, she’s also been noted to have hypercalcemia with a low PTH level.

**RDS:** She's done back pain, back therapy, uneventful recent pain.

**Past Surgical History:** She has surgical history of previous total hip replacement, due to hip arthroplasty.

**Social Hx:** Denies history of smoking, very rare alcoholic use.

**OBJECTIVE:**
- N/V/A Labs: BUN and creatinine normal, albumin 3.4 mg/dL
- ESR 60; CRP 5.2
- Cardiac enzymes normal and negative, no sign of ischemia
- Labs post vitals: 14/4 BP, 118 HR
- Rashes: 122, 33:8, 23:6, 34:8, 57:3, 22:3, 56:8, 32:2, 23:6, 33:8, 56:3
- Labs post vitals: 14/4 BP, 118 HR

**CLINICAL WORKUP:**
- U/S GUEM: right kidney stones and hydronephrosis; labs: creatinine 2.6 mg/dL, BUN 25 mg/dL
- CT: right hip fracture, right thigh fracture
- C-spine: negative, no cord compression
- U/S neck: negative, no cord compression

**HYPERCALCEMIA**
Calcium Supplementation Overdose: A high calcium intake is a known cause of hypercalcemia. However, in patients with a tissue-destructive urea cycle or amiloride problem due to a diet rich in calcium or calcium-channel blockers, it can cause hypercalcemia. Hypercalcemia due to an overdose should not exceed 2,000 mg.

**ACUTE KIDNEY INJURY**
- Acute kidney injury is a condition where the kidney is not able to filter urine adequately, leading to a buildup of waste products in the body. It can be caused by various factors, such as dehydration, sepsis, or kidney injury due to medications or drugs.

**ELEVATED PTH Rp**
- Where it comes from:
  - Osteoblasts, osteocytes, osteoclasts, fibroblasts, macrophages, chondrocytes, mesenchymal stem cells, kidneys, beta cells, medulla, and parathyroid glands.

**MONOClonAL GAMMOPATHY**
- Serum Protein Electrophoresis is used to measure immunoglobulins in light, kappa, lambda.
- Specifically, the 5 protein isotypes include: alpha, kappa, lambda, and gamma globulins.
- Monoclonal gammopathy may result from a single clone or population of plasma cells.
- The result can be suggestive of monoclonal B cell or plasma cell proliferations.

- In multiple myeloma, plasmacytoma, myeloma, and leukemia.
- About 2% to 3% of the time, a polyclonal B cell or plasma cell proliferations.
- In the presence of monoclonal gammopathy and bone pain, kidney injury, paraproteinemia, anemia, and Bence Jones protein found in urine.

**CONCLUSIONS**
- Serum Protein Electrophoresis is a useful tool to diagnose monoclonal gammopathy.
- It can be used for early detection and management of plasma cell disorders.
- It is important to consider the presence of monoclonal gammopathy in patients with persistent symptoms such as bone pain, kidney injury, and paraproteinemia.

**REFERENCES**