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Background: Tumor-generated ectopic intact PTH is difficult to diagnose and should be suspected in patients with apparent primary hyperparathyroidism but with normal parathyroid glands.
Clinical Case: A 72-year-old man presented with symptoms of hypercalcemia including generalized weakness, polyuria, and polydipsia. Initial labs were consistent with primary hyperparathyroidism: calcium 12.1 mg/dL (n 8.6–10.3 mg/dL, albumin-corrected 12.5 mg/dL), intact PTH (iPTH) 115.6 pg/mL (n 10–65 pg/mL), low normal 25-OH vitamin D (25 ng/mL, n 25–100 ng/mL), and relatively high normal 1,25 dihydroxyvitamin D (52 pg/mL, n 18–78 pg/mL). 24-hour urine calcium was 381 mg/day (n 100–300 mg/day) and PTHrP was 1.6 pmol/L (n <4.2 pmol/L). Neck ultrasound demonstrated a 0.5 x 1 cm hypoechoic mass near right thyroid inferior pole, though sestamibi SPECT/CT scan did not reveal scintographic evidence of a parathyroid adenoma. He underwent subtotal parathyroidectomy with largest excised gland weighing 0.262 grams. The left inferior parathyroid gland appeared normal intraoperatively, thus was clipped and left in place. PTH decreased from 194 pg/mL to 98 pg/mL postoperatively. Pathological examination revealed three normocellular parathyroid glands with enlargement of only the right superior gland. Venous sampling of the parathyroid vasculature failed to identify the source of autonomous iPTH post operatively. Due to refractory hypercalcemia, cinacalcet was initiated. However, hypercalcemia as high as 12.6 mg/dl and hyperparathyroidism to 672 pg/mL persisted despite dose escalation. He eventually received pamidronate with subsequent transition to denosumab due to declining renal function. A ^{68}Ga DOTATATE scan was performed to locate occult ectopic parathyroid, which reported multiple foci of presumed somatostatin receptor expression involving the liver and intra-abdominal lymph nodes without significant uptake in the neck concerning for metastatic disease. Liver lesion biopsy was consistent with pancreato-biliary adenocarcinoma. Surprisingly, the biopsy was negative for iPTH and neuroendocrine tumor markers on staining/immunohistochemistry. Given his poor prognosis and multiple comorbidities, the patient opted not to pursue any further workup or therapy for his malignancy.
Conclusion: Occult malignancy should be suspected for a patient with persistent hyperparathyroidism after parathyroidectomy. Treatment of the malignancy may lead to an improvement in hypercalcemia and iPTH levels. Employment of iPTH mRNA testing or intra-abdominal venous sampling to prove ectopic iPTH secretion would be ideal, as iPTH staining could be falsely negative. Further testing was not completed as the patient declined further evaluation.

Bone and Mineral Metabolism
BONE AND MINERAL CASE REPORT

Experience With Anti-Sclerostin Antibody for Osteoporosis Patient With End-Stage Renal Disease on Hemodialysis

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Background: Romosozumab is a sclerostin inhibitor indicated for treatment of postmenopausal osteoporosis. Sclerostin inhibits Wnt/Beta-catenin signaling pathway. When sclerostin is inhibited, stimulation of this pathway leads to increased bone formation and production of osteoprotegerin, which also decreases bone resorption. Patients with chronic kidney disease (CKD) demonstrate increased levels of sclerostin that negatively correlates with the rate of bone formation; however, data is lacking for use of romosozumab in this patient population. The report herein details the experience of use of romosozumab in a patient with end-stage renal disease (ESRD) on hemodialysis (HD). **Clinical Case:** A 37-year-old old African American male was referred after multiple rib fractures and severe non-traumatic T8 compression fracture with nerve compression. His past medical history includes lupus nephritis and cerebritis, ESRD on HD since age 22 status post (s/p) failed renal transplant, and tertiary hyperparathyroidism complicated with fracture in iliac brown tumor and mediastinal parathyromatosis s/p three parathyroid surgeries. Bone mineral density by DXA (g/cm^2, Z-score) were as follows: lumbar spine (0.700, -4.0) femoral neck (0.676, -3.8), total hip (0.628,-4.0), 1/3 radius(0.443,-6.2). No prior exposure to antiresorptive or osteoanabolic agents. Pertinent labs included serum calcium 8.5 mg/dL (nl 8.9–10.3 mg/dl), albumin 4.2 g/dL, alkaline phosphatase 319 U/L (nl 38–126), Phosphorus 3.1 mg/dL (2.4–4.7), Creatinine 5.62 mg/dl, 25-OH Vitamin D 31 ng/mL (nl 25 - 80), intact parathyroid hormone 17.9 pmol/L (nl 1.6–6.9). Patient was in excruciating pain and not a surgical candidate due to poor bone quality. Osteoanabolic therapy was recommended given the severity of osteoporosis; however, teriparatide and abaloparaitde were contraindicated given comorbidities. The patient was offered off-label use of Romosozumab with clear understanding that the drug is not approved for this indication and safety/efficacy data in ESRD is not known. The boxed warning regarding increased risk of stroke, myocardial infarction and death were discussed and patient was willing to proceed. Repeat DXA after eleven monthly doses of Romosozumab resulted in a remarkable improvement in bone mineral density at all sites: lumbar spine (+47%), femoral neck (+41%), total hip (+28%), 1/3 radius (+20%). Patient tolerated medication with no side effects or fractures. Serum calcium was monitored prior to initiation and before every dose. No doses were held due to abnormal laboratory values or side effects. **Conclusion:** This case report summarizes successful experience with the use of Romosozumab in one patient with ESRD on HD with favorable outcomes.

Bone and Mineral Metabolism
BONE AND MINERAL CASE REPORT

Extreme Secretion of PTHrP From a Pancreatic Neuroendocrine Tumor, A Shift From Severe Hypercalcemia to Hypocalcemia