Bone and Mineral Metabolism
PARATHYROID AND RARE BONE DISORDERS

Patients With Primary Hyperparathyroidism Have Shorter QT/QTc Intervals

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Background: Previous studies suggest that patients with primary hyperparathyroidism (PHPT) have subclinical cardiovascular disease, but data regarding cardiac conduction abnormalities are limited. The aim of this study was to assess cardiac conduction abnormalities in patients with PHPT compared to controls with thyroid disease (TD).
Method: We conducted a retrospective analysis of patients over 40 years of age who underwent parathyroidectomy or thyroidectomy at a single tertiary institution between 2013 and 2018. Demographics and EKG parameters from pre-operative EKG reports were compared using the Mann-Whitney U and Chi Square tests. Regression was used to compare EKG differences between the PHPT and control groups adjusted for sex, age, and other variables found to be significant on univariate analysis.
Results: A total of 1181 patients were analyzed, 51% in the PHPT group (n=602) and 49% in the TD group (n=579). The median age was 60.5 years (IQR 53.5–67.9) and there was no difference in sex between the cohorts. PHPT patients had a higher prevalence of hyperlipidemia (HLD, 49% vs 36%, p<0.001) and hypertension (HTN, 50.7% vs 42.1%, p<0.01), but had no differences in EKG rhythm patterns or prevalence of arrhythmia compared to TD patients. As expected, mean serum calcium levels were higher for the PHPT group, 10.74 (0.66) vs 9.53 (0.44). However, the PHPT group included both normocalcemic and hypercalcemic patients. The PHPT group had a lower median QT interval compared to the TD group, 386ms (IQR 368–406) vs 398ms (IQR 376–418), p<0.001 and a higher median PR value, 158ms (IQR 144–174.5) vs 156ms (IQR 143.5–171), p<0.05. More PHPT patients (n=21, 3.5%) had a short QTc interval (<360ms males/<370ms females), compared to TD controls (n=1, 0.2%). Among PHPT patients with a short QT interval, the proportion of patients with hypercalcemia (95%) was higher than that of the PHPT group overall (75%). On multivariable analysis, PHPT patients had a shorter QT interval than TD controls after controlling for sex, age, HLD, HTN. There was no difference between PHPT and TD when serum calcium was included in the model, suggesting that calcium mediates the relationship between QT interval and disease status.
Conclusion: PHPT patients have shorter QT/QTc intervals compared to TD controls, but no increased prevalence of arrythmia at baseline. While the QT interval was associated with degree of serum calcium elevation, these findings in a large cohort suggest that PHPT is not associated with arrythmia at baseline among those undergoing parathyroidectomy.

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Rare Case of Severe Hypercalcemia Secondary to Atypical Sestamibi Negative Parathyroid Cystic Adenoma

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Primary hyperparathyroidism (PHPT) is defined as excessive secretion of parathyroid hormone (PTH) originating from the parathyroid gland. The most common cause is a single parathyroid adenoma which is typically solid. Cystic parathyroid adenomas (CPA) are the cause of about 1–2% of cases of primary hyperparathyroidism. It is known that cystic parathyroid adenomas are a result of degeneration of an existing parathyroid adenoma. SestaMIBI is an imaging study based on uptake of radioactive technetium99 and used to localize parathyroid adenomas. We describe an unusual case of severe hypercalcemia secondary to 99mTc sestaMIBI negative atypical parathyroid cystic adenoma. A 56-year-old male presented to our facility with nausea and vomiting. His past medical history included hypertension and hepatitis C with no history of fractures or kidney disease. Physical examination was normal. Upon admission the patient was afebrile with blood pressure of 170/120 mmHg and heart rate of 62 bpm. Chemistry showed Calcium of 14.5 mg/dL (8.6–10.2mg/dL), phosphorus 2.2 (2.7–4.5) mh/dL, magnesium 1.8 (1.7–2.6)mg/dL, intact PTH of 375 (15–65) pg/mL, PTH-related peptide <2.0 pmol/L(<2 pmol/L), 25-OH vitamin D of 19 ng/ml (30–80), Creatinine 1.22 (0.7–1.2)mg/dL, alkaline phosphatase 95 (40–129) units/L. He was started on aggressive hydration, calcitonin 4 units/kg, 4 mg of IV Zolendroninc acid. Neck sonogram revealed a large, complex, predominantly anechoic lesion with solid vascular components and thick internal septations in the inferior and medial aspect of the right thyroid lobe measuring 3 x 2 x 5.5 cm. Findings were confirmed with CT of the neck. Since Sestamibi scan (planar and SPECT/CT) did not show uptake in parathyroid glands, the cyst was thought to be of thyroid origin. Fine needle aspiration was not able to detect cellular material, but PTH was >100 pg/ml on the FNA sample. Otolaryngology service was consulted for parathyroidectomy. During the surgical treatment, the right upper parathyroid gland was removed with no changes in serum PTH. Next, the cystic lesion was removed with normalization of serum PTH (from 218 pg/ml to 35.2 pg/ml respectively). Intraoperative frozen section analysis was read as a cystic parathyroid adenoma. The final pathology report revealed cystic parathyroid tissue favoring parathyroid adenoma with focal atypia. Hypercalcemia resolved. **Conclusions:** Atypical cystic parathyroid adenomas are a rare cause of PHPT. 90% of parathyroid cysts are nonfunctional. Above mention is a case of a patient presenting with hypercalcemic crisis secondary to cystic parathyroid adenoma, which posed a diagnostic challenge as both neck ultrasound and 99mTc sestaMIBI scan