

a head CT scan performed between 2000 and 2020. Head CT scans were performed for reasons unrelated to hypoparathyroidism in 96.5% of patients. In this cohort, 80.3% of patients (n=114) had post-surgical hypoparathyroidism. Age at which the first head CT in patients was done was 62±20.6 (range 11–97), and duration of hypoparathyroidism at the time of first head CT was 11.0±14.4 years (0–71). Prevalence of BGC in patients with hypoparathyroidism was 25.4% (n=36), as compared with 7.3% in the control group (31/426) (P<0.001). Patients and controls were similar in terms of cardiovascular risk factors (diabetes, hypertension, dyslipidemia, alcohol consumption, smoking status and BMI). In patients with non-surgical hypoparathyroidism (n=28), prevalence of BGC was 71.4% vs. 14.0% in the postsurgical cohort (OR 15.4; 95% CI 5.8–40, P<0.001). Compared to patients with hypoparathyroidism without BGC, those with BGC had lower time-weighted average serum calcium (8.4±0.8 vs. 8.8±0.8, P=0.002; normal range, 8.6–10.2 mg/dL), and lower time-weighted average calcium/phosphate ratio (Ca/P) (1.83±0.52 vs. 2.13±0.47, P=0.007). **Conclusions:** Basal ganglia calcification in hypoparathyroidism is associated with low serum calcium and low Ca/P ratio. This may allow increased bioavailability of phosphate in the extracellular space, leading to calcium phosphate crystal formation within the basal ganglia. Assessing Ca/P ratio may be useful to identify patients at risk for BGC. Prevalence of BGC is significantly higher in patients with non-surgical hypoparathyroidism.

Bone and Mineral Metabolism PARATHYROID AND RARE BONE DISORDERS

Bilateral Neck Exploration May Not Reduce the Risk of Persistence but Shows a Perspective Advantage

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There is still no consensus for an optimal surgical treatment of primary hyperparathyroidism (PHPT). Virtually, most of the patients could be successfully treated with the selective parathyroidectomy (SPTE) based on preoperative visualization. However, this approach still has a “blind area” of undetected multiglandular disease (MGD). Bilateral neck exploration (BNE) may serve as a reasonable alternative but it meets the higher requirements for the surgical technique. A retrospective cohort study was conducted in order to reveal factors associated with the persistence of PHPT. 587 cases of PHPT patients who had received surgical treatment at SPSU Hospital in 2017–2018 were included. All the patients have at least one preoperative visualization study

(neck ultrasound performed by a surgeon) before the operation. In 356 cases two studies were performed (additional 4D CT or MIBI scan) and 116 cases had all three. A surgeon was free to choose a type of the operation (selective or explorative) according to their strategic preferences. Bilateral neck exploration was performed in 160 cases. There was no difference in bilateral exploration rate (p = 0.3896) between the groups (with 1, 2 or 3 studies performed) indicating that the additional visualization does not allow to avoid bilateral exploration. MGD rate accounted for 7.4% (40 cases). It is important that any set of preoperative visualization modalities prove the absence of MGD reliably and select patients for SPTE precisely. Negative predictive value for different combinations of concordant studies (US+MIBI, US+CT and US+CT+MIBI) did not differ significantly and was 96.95%, 97.4% and 97.7% respectively. 26 cases of persistent disease were reported with no significant difference between BNE and SPTE groups. (6 vs 20 respectively, p = 0.792). A history of the thyroid or parathyroid operations was found to be the only factor predicting the higher risk of persistence (OR = 7.98; 95% CI [2.62 - 24.27]), while neither the number of parathyroid glands found during the surgery nor the number of preoperative visualization studies showed statistical significance. Only 47.5% cases of BNE was reported to have all four glands visualized. There rate of failure to found each gland was similar. Surprisingly, the superior parathyroid adenomas (P4) were more likely to be removed (chi-squared 10.378, p = 0.0006) but not in the cases with all four glands visualized intraoperatively (chi-squared 1.822, p = 0.0884). The true rate difference due to a hypothetical feature of parathyroid physiology seems to be not very likely. One may rather suggest than it is not an uncommon for a surgeon to identify a P3 gland as a P4 unless all for glands are visualized. This fact shows a perspective advantage which may prevent some cases of persistence.

Bone and Mineral Metabolism PARATHYROID AND RARE BONE DISORDERS

Bone Microarchitectural Changes in Hyperthyroid Women Compared to a Normal Canadian Cohort

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Thyroid hormones play a critical role in bone physiology during childhood, but also impacts adult bone metabolism. Hyperthyroidism promotes accelerated bone turnover and bone remodelling which is associated with net loss of bone mineral density over time (BMD) and these changes have been quantitated using the gold standard of measuring BMD, Dual Energy X-ray Absorptiometry (DEXA). Ordinarily, biochemical thyroid hormone normalization restores BMD towards normal, yet an increased risk of fractures remains lifelong. DEXA, therefore, cannot explain the underlying etiology for fracture risk which may be due to undetected changes in bone microarchitecture. Our primary objective was to utilize an investigational 3-dimensional bone imaging technology, High Resolution peripheral Quantitative Tomography (HR-pQCT), to study bone microarchitecture in actively hyperthyroid women to determine if there are changes in cortical and trabecular