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CHANGES IN CARDIOVASCULAR CALCIFICATION AFTER PARATHYROIDECTOMY IN DIALYSIS-DEPENDENT PATIENTS**Alexander Zolotykh¹, Ekaterina Parshina², Alexey Tolkach², Tatyana Pridvikhina³ and Konstantin Novokshonov⁴**¹Saint Petersburg State University, Medical Faculty, Saint Petersburg, Russia, ²Saint Petersburg State University Hospital, Department of Nephrology and Dialysis, Saint-Petersburg, Russia, ³Saint Petersburg State University Hospital, Department of radiology, Saint-Petersburg, Russia and ⁴Saint Petersburg State University Hospital, Department of Endocrine Surgery, Saint-Petersburg, Russia**Background and Aims:** Vascular calcification (VC) is common in patients with end stage kidney disease on dialysis and with secondary hyperparathyroidism (SHPT). There is a lack of knowledge regarding dynamics of VC after surgical treatment of SHPT. We aimed to evaluate evolution of coronary artery calcification (CAC) and abdominal aortic calcification (AAC) after parathyroidectomy (PTx) in dialysis patients with SHPT.**Method:** The prospective cohort study included 33 dialysis-dependent patients (mean age of 50±13 years) with severe SHPT who underwent subtotal (n = 16) or total PTx with autotransplantation of parathyroid tissue (n = 17). Cardiac computed tomography scan (quantification of coronary calcium by Agatston method) and lateral lumbar X-ray (semi-quantitative Kauppila score) were used to assess prevalence of VC before and 18 months after surgery. Levels of serum total calcium, phosphorus, parathyroid hormone (PTH), and alkaline phosphatase (AP) before and 18 months after surgery were also evaluated.**Results:** In our cohort median dialysis vintage before surgery was 71 [Q1-Q3: 29; 136] months, total serum Ca was 2.47±0.23 mmol/l, median PTH was 139 [Q1-Q3: 90; 161] pg/ml. Prevalence of CAC before PTx was 79% (n = 26), and 61% (n = 20) of patients had AAC. Of note, 54.5% of the patients had severe coronary calcification (>400 AU), while only 12% were considered to have severe calcification using Kauppila score (>12). We observed moderate positive correlation between CAC and AAC scores (Spearman's $\rho = 0.699$ [95% CI: 0.48; 0.84], $p < 0.0001$). Both CAC and AAC scores correlated moderately with age of the patients ($\rho = 0.57$ [95% CI: 0.3; 0.76], $p = 0.0002$, and $\rho = 0.64$ [95% CI: 0.39; 0.8], $p < 0.0001$, respectively), AAC had weak correlation with their dialysis vintage ($\rho = 0.45$ [95% CI: 0.14; 0.68], $p = 0.005$). Median of baseline CAC was 458 [Q1-Q3: 23; 1585] AU, after 18 months - 491 [Q1-Q3: 58; 1956] AU, no statistically significant differences were observed ($p = 0.91$, Wilcoxon test). We did not find statistically significant differences between median of Kauppila scores before and after PTx as well: 3 [Q1-Q3: 0; 10] and 2 [Q1-Q3: 0; 10], correspondingly, $p = 0.17$ (Wilcoxon test) - Fig. 1.As it can be seen from Fig. 1, dynamics of both CAC and AAC values before and after PTx varied markedly across subjects. To investigate the factors that can promote VC we divided patients into 2 groups based on dynamics of CAC (as the most accurate assessment method) 18 months after surgery: group 1 with CAC progression of more than 50 AU (n = 9) and group 2 with regression or progression less than 50 AU (n = 24). Patients who had progression of coronary calcification by the end of the follow-up had higher age (59±11 vs 46±12 years in 2nd group, $p = 0.0128$) higher serum calcium levels (2.57±0.24 vs 2.29±0.32 mmol/l in 2nd group, $p = 0.0267$), and higher AP levels at follow-up (69.8 [Q1-Q3: 62.8, 96.0] vs 51.7 [Q1-Q3: 41.4; 57.1] U/ml in 2nd group, $p = 0.003$). Univariate analysis showed no significant differences between groups

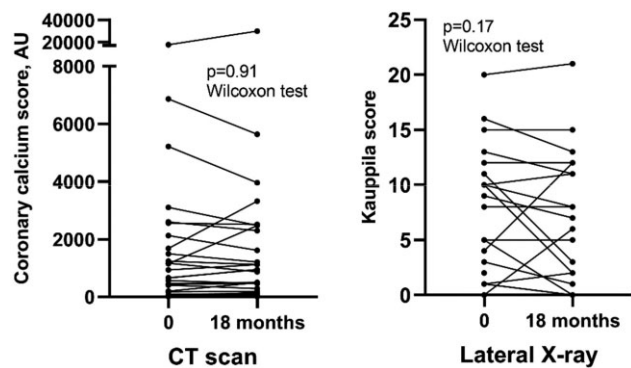


Figure 1: Dynamics of coronary and abdominal calcium scores in dialysis-dependent patients before and 18 months after parathyroidectomy for secondary hyperparathyroidism. Coronary calcification was assessed using cardiac computed tomography scan, Agatston method (left), while calcification of abdominal aorta was assessed using lateral lumbar X-ray, Kauppila method (right).

comparing dialysis vintage ($p = 0.53$), phosphate levels ($p = 0.54$), PTH levels ($p = 0.32$). In addition, CAC progression risk was not associated with type of surgery (total vs subtotal PTx RR = 1.11 [95% CI: 0.71; 1.8], OR = 1.48 [95% CI: 0.3; 5.7], $p = 0.708$).

Conclusion: Prevalence of vascular calcification in dialysis-dependent patients with severe SHPT is high. Progression of CAC by 18 months after PTx was associated with higher age of the patients, higher follow-up levels of serum total Ca and AP.