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Predictive factors of persistent hypercalcemia with tertiary hyperparathyroidism after parathyroidectomy in kidney transplantation patients

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Objectives: Surgical management is treatment of choice for tertiary hyperparathyroidism. The aim of this study was to analyze which factors were attribute to persistent hypercalcemia and to evaluate the surgical extent in tertiary hyperparathyroidism (THPT) after kidney transplantation.

Methods: We retrospectively analyzed 100cases for THPT after kidney transplantation between june 2011 and february 2022at Asan Medical Center. Patients were divided into two groups: 22 patients with persistent hypercalcemia after parathyroidectomy and 78 patients with normocalcemia after parathryoidectomy. Persistent hypercalcemia was defined as sustained hypercalcemia(≥10.3mg/dL) 6months after the surgical management. We compared biochemical and clinicopathological features between the two groups. Multivariable logistic regression analysis method was used to evaluate possible risk factors associated with persistent hypercalcemia.

Results: The incidence of patients with serum intact PTH level more than 65 pg/mL was significant higher in hypercalcemia group (40.9% vs. 7.7%). The proportion of patients who underwent less than subtotal thyroidectomy was significant higher in persistent hypercalcemia group(19.2% vs. 50%). The patient with bigger remnant size of preserved parathyroid gland(≥0.8cm) cause more common persistent hypercalcemia (29.7% vs. 52.6%).
In multivariate logistic regression analysis, the drop rate of intact PTH less than 88% at POD1 [OR 10.3, 95% CI(2.7~39.1), p=0.001], the resected parathyroid gland less than two [OR 6.8, 95% CI(1.8~26.7), p=0.001] were determined as a risk factor associated with persistent hypercalcemia.

Conclusions: The drop rate of intact PTH less than 88% at POD1 was independently associated with persistent hypercalcemia with the extent of surgery enough to control the autonomic function by resecting the appropriate parathyroid volume. The confirmation of parathyroid lesion through frozen biopsy or intraoperative PTH monitoring might be helpful to prevent the missing parathyroid gland and to accomplish normocalcemia after parathyroidectomy.