

中文題目：制動性高血鈣症發生在一位正常血鈣型副甲狀腺機能亢進之患者

英文題目：Immobilization-induced hypercalcemia in a patient with normocalcemic primary hyperparathyroidism

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Introduction: Immobilization is an uncommon cause of hypercalcemia, which is diagnosed by exclusion of more common etiologies. Likewise, normocalcemic primary hyperparathyroidism (NHPT) is a new phenotype of primary hyperparathyroidism, and should also be diagnosed by exclusion of all secondary causes for hyperparathyroidism. We present a woman who had the two diseases successively.

Case presentation:

A 81-year-old woman has the past medical history of hypertension, heart failure, atrial fibrillation, and dementia. She received a revision surgery on Nov. 13, 2020 to repair linear wearing of her right total hip arthroplasty. She remained in an almost bedridden status. The patient was admitted because of intermittent confusion in August 2021. Her serum calcium level was 12.5 mg/dL. The serum PTH was within normal range (19.2 pg/mL). Imaging and laboratory workup were unremarkable for malignancy, thyroid disorder, or infection. According to the clinical history, immobilization was the most possible etiology to cause hypercalcemia in this patient. After adequate hydration, her confusion consciousness soon improved. The level of serum calcium recovered to 8.7 mg/dL one month later. Meanwhile, the level of intact parathyroid hormone (iPTH) suddenly raised to 273 pg/mL. During the following 6 months, her serum iPTH remains at very high levels (range 95-125.8 pg/mL), with persist normal serum calcium level. Laboratory workup was unremarkable for chronic kidney disease or vitamin D deficiency. She didn't take loop diuretics or medications for inhibition of bone resorption. The diagnosis of normocalcemic primary hyperparathyroidism was made.

Table 1. Patient biochemical parameters for the diagnosis of hypercalcemia

Parameter	Result	Units	Reference value
Serum Calcium	12.5	mg/dL	8.6-10.3
Corrected Calcium	12.8	mg/dL	8.6-10.3
Albumin	3.6	g/dL	3.5-5.7
Phosphorus	2.5	mg/dL	2.1-4.7
Alkaline Phosphatase	57	U/L	34-104
Creatinin	0.72	mg/dL	0.6-1.2

iPTH	19.2	pg/mL	12-88
25-OH-vitamin D	29.5	ng/mL	30-100

iPTH, intact parathyroid hormone

Table 2. Patient biochemical parameters for the diagnosis of NHPT

Parameter	Result	Units	Reference value
Serum Calcium	8.5	mg/dL	8.6-10.3
Corrected Calcium	9.4	mg/dL	8.6-10.3
Albumin	2.9	g/dL	3.5-5.7
Alkaline Phosphatase	56	U/L	34-104
Creatinin	0.63	mg/dL	0.6-1.2
iPTH	273	pg/mL	12-88

NHPT, normocalcemic primary hyperparathyroidism; iPTH, intact parathyroid hormone

Discussion: PTH level is rarely measured when the serum calcium level is normal. Intact PTH levels were regularly measured in this patient because she had just recovered from immobilization-induced hypercalcemia. Patients with symptomatic NHPT, such as renal stones or bone complications, should undergo parathyroid surgery. Although this patient has no symptoms yet, studies had proved that bone loss occurs silently over time in NHPT. Therefore, monitoring for symptoms which would be the indications for surgery is essential.

Conclusion: Normal iPTH level can be found on a hypercalcemic patient. The same patient can later present normal serum calcium level with high iPTH level. Thus, rigorous laboratory and imaging workup should always be done on a hypercalcemic patient. Patients should receive regular monitoring for symptoms.