

# Pseudohyperparathyroidism

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## Abstract

**Objective** – To describe a probably rare, but confusing, situation regarding the diagnosis of normocalcemic hyperparathyroidism.

**Case Report:** Following surgery for hyperparathyroidism, a parathyroid gland was transplanted into the patient's lower right arm. The patient was a poor historian and 4 years later when her care was transferred to another clinic, this information was not obtained. Blood sampled from that arm revealed elevated parathyroid hormone and normal calcium levels. Blood subsequently sampled from the other arm revealed normal parathyroid hormone and calcium levels.

**Discussion:** Although parathyroid gland transplantations have fallen out of favor because they often do not function either acutely or sustainably, this patient showed that some do continue to function and can confuse subsequent evaluations.

**Conclusion:** This case illustrates (once again) the importance of an accurate patient history.

**Keywords:** hyperparathyroidism; parathyroid gland; normocalcemic

## Introduction

Normocalcemic hyperparathyroidism (NHPT), first defined and accepted by the 3rd International Workshop on the Management of Asymptomatic Primary Hyperparathyroidism [1] with further refinements in the 4<sup>th</sup> Workshop [2] is characterized by persistently elevated parathyroid hormone (PTH) but normal serum calcium levels [3]. This diagnosis is one of exclusion after causes of secondary hyperparathyroidism have been excluded. These include vitamin D deficiency, calcium malabsorption, renal failure, certain medications (loop and thiazide diuretics, lithium, bisphosphonates, denosumab) and idiopathic hypercalciuria [3]. Finally, pseudohypoparathyroidism, a group of rare disorders with biochemical and clinical features of hypoparathyroidism but with target organ resistance to the effects of PTH, is also characterized by elevated levels of PTH and normocalcemia [4]. Most of these patients have an abnormality of the Gs protein or its downstream effector system. NHPT is thought to represent early primary hyperparathyroidism before the serum calcium becomes elevated [5].

## Case Presentation

The following patient represents a situation in which NHPT may be mistakenly diagnosed. When this 61-year-old woman transferred her care to our Federally Qualified Health Center last year, she gave a history of surgery for hyperparathyroidism in 2017. No previous records were available but were requested. Consequently, PTH and calcium levels were measured on September 4, 2020 (Table). The PTH level returned at 344 pg/ml. Suspecting a laboratory or reporting error, the test was repeated when the patient next returned to the clinic on April 6, 2021 and the value returned at 759 pg/ml. Once again, previous records were requested and finally became available. The surgical note revealed that a parathyroid gland had been transplanted in the lower right arm. When queried, the patient responded that both samples had been obtained from the right arm. The third blood sampling on May 18, 2021 took place from the left arm and the PTH concentration was 37 pg/ml. Serum calcium levels were normal in all 3 blood samples in which PTH was measured. The eGFR was normal and the 25 hydroxyvitamin D level was 22 ng/ml in the second blood test, a value that is not low according to the Institute of Medicine [6].

Date	PTH* (pg/ml)	Calcium (mg/dl)	eGFR (ml/min/1.73 m <sup>2</sup> )	25-OH vitamin D (ng/ml)
September 4, 2020	344	8.9	96	-
April 6, 2021	759	9.5	-	22
May 18, 2021	37	9.4	98	-

\*Parathyroid hormone

*Table: Patient's Laboratory Values*

## Discussion

This patient represents a situation in which NHPT may be mistakenly diagnosed. Although the possibility of calcium malabsorption and hypercalciuria were not pursued, the patient was not taking any of the drugs associated with secondary hyperparathyroidism and the eGFR was normal. Furthermore, PTH levels in secondary hyperparathyroidism are not as high as this patient's initially measured values. These very high PTH concentrations may be seen in tertiary hyperparathyroidism but in this patient, the eGFR was normal.

## Conclusion

This case illustrates the importance of an accurate history (not always available from the patient). Specifically, if a parathyroid gland transplantation to one arm has occurred, the patient needs to be reminded to have the other arm sampled when PTH levels are ordered. We have labelled this situation as "pseudohyperparathyroidism".

## References

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