

# False High Parathormone Levels Due to Preanalytical Differences in Patient With Parathyroid Gland Autotransplantation

Cevdet Duran<sup>a, c</sup>, Orkide Kutlu<sup>b</sup>, Mustafa Cayci<sup>c</sup>, Ferda Sevimli Burnik<sup>a</sup>, Omer Karahan<sup>d</sup>, Uysaler Aslan<sup>b</sup>, Samil Ecirli<sup>b</sup>

## Abstract

High parathormone (iPTH) values in the patients having parathyroid autotransplantations can be derived from parathyromatosis or preanalytical differences. In this report, we presented a patient with kidney failure and factitiously high iPTH levels. Because of tertiary hyperparathyroidism, total parathyroidectomy and 1/2 parathyroid tissue autotransplantation to brachioradial muscle in right forearm operation has been performed. Although he has been followed with high iPTH levels for a long time, he does not have parathyromatosis. iPTH level was found normal when blood samples were taken from the other arm. High iPTH levels are thought to be related to the place where the blood samples taken i.e., samples taken from the proximal region of autotransplantation, we recommend the blood sample should be taken from the contralateral or distal region of the autotransplantation in order to avoid misdiagnosis and unnecessary and incorrect procedures in patients with parathyroid autotransplantation.

**Keywords:** Renal failure; Parathyroid autotransplantation; High parathormone level; Preanalytical difference

## Introduction

Tertiary hyperparathyroidism (THPT) is a serious and important complication in patients with advanced renal insufficiency [1]. Total parathyroidectomy with immediate par-

tial parathyroid autotransplantation is an alternative method for treatment of THPT [2]. In this procedure; bilateral neck exploration and total parathyroidectomy are performed and 1/2 parathyroid tissue is implanted to the parasternal region or brachioradial muscle of forearm [3]. Generally, the arm without fistulae is preferred in forearm autotransplantations.

The state of high impact parathormone levels (iPTH) continuing after surgery is called parathyromatosis [4-7]. Enlargement of the parathyroid tissue that is seeded or implanted on forearm is blamed for parathyromatosis. The frequency of parathyromatosis in forearm autotransplantations is reported between 0.11% and 58% [6, 7]. Another cause of high iPTH level after total parathyroidectomy with autotransplantation is due to preanalytical differences. Factitiously high iPTH levels can be found if blood samples were taken proximal vein to the site of parathyroid autotransplantation [8-11]. Here we presented a patient with total parathyroidectomy and 1/2 parathyroid tissue autotransplantation to right brachioradial muscles in the forearm operation (contralateral to the arterious-venous fistulae) has been performed due to tertiary hyperparathyroidism. Although he did not have parathyromatosis, he has been followed with high iPTH value for a long time.

## Case Report

A fifty-six years old male patient has had chronic kidney failure and hemodialysis treatment for 15 years. Ten years ago, total parathyroidectomy and 1/2 parathyroid gland autotransplantation to the brachioradial muscle in the right forearm operation had been performed due to tertiary hyperparathyroidism. Living donor renal transplantation had been performed 4 years ago. Before the transplantation, iPTH levels were between 90 and 477 pg/ml (N: 11 - 67 pg/mL), after renal transplantation iPTH levels were between 190 and 1853 pg/ml. Parathyroidomatosis had been suspected and scintigraphic imaging with Tc-99m MIBI had been done and no focus had been found in another center. When he admitted to our out-patient clinic, his laboratory analysis showed that; iPTH value was 2382 pg/mL, calcium 9.2 mg/dL (N: 8.4 - 10.2 mg/dL), phosphorus 4.2 mg/dL (N: 2.5 - 4.5

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<sup>a</sup>Division of Endocrinology, Department Internal Medicine, Konya Training and Research Hospital, Konya, Turkey

<sup>b</sup>Division of Internal Medicine, Konya Training and Research Hospital, Konya, Turkey

<sup>c</sup>Department of Nuclear Medicine, Konya Training and Research Hospital, Konya, Turkey

<sup>d</sup>Department of General Surgery, Konya Training and Research Hospital, Konya, Turkey

<sup>e</sup>Corresponding author: Cevdet Duran, Division of Endocrinology, Department Internal Medicine, Konya Training and Research Hospital, Konya, Turkey. Email: drcduran@gmail.com

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mg/dL), albumin 3.9 g/dL (N: 3.5 - 5 g/dL), urea 45 mg/dL (N: 15 - 55 mg/dL), creatinine 1.51 mg/dL (N: 0.7 - 1.3 mg/dL). Vitamin D was not measured. In order to understand whether the raised level of iPTH values are due to the area where the blood samples were taken from, samples were taken both from the right arm (proximal and distal from the region where the implantation was done) and from the left (contralateral) arm. iPTH values were detected as 1,863 pg/mL in the sample taken from the right forearm proximal site of autotransplantation, and 75.6 pg/mL in the sample from the distal and 30 pg/mL from the left arm sample. It became apparent that the differences between the iPTH values are due to the place of the blood samples taken.

## Discussion

In patients with parathyroid gland autotransplantations, pre-analytic factors such as the place of blood samples taken may cause high iPTH levels except parathyromatosis. In patients with renal failure, it is avoided to take blood samples from arm with arterious-venous fistulae. This causes factitious and incorrect iPTH levels for patients with parathyroid autotransplantations and in the literature, there are limited knowledge for this problem [8-11]. The fact that autotransplants veins drain to antecubital veins, the parathormone released from autotransplant to antecubital veins also. That causes extremely high and incorrect iPTH values if blood samples are taken from the proximal region of arm having autotransplantation [8-11].

Conclusively, we recommend in order to avoid misdiagnosis and leading to unnecessary and incorrect procedures, the blood sample should be taken from the contralateral or distal site of the autotransplantation. In the evaluation of parathyroid functions, not only the iPTH level, but also the other biochemical parameters should be assessed together at the same time.

## Conflict of Interest

There is no conflict of interest.

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