



ORIGINAL ARTICLE

Localization of ectopic and supernumerary parathyroid glands in patients with secondary and tertiary hyperparathyroidism: surgical description and correlation with preoperative ultrasonography and Tc99m-Sestamibi scintigraphy[☆]

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KEYWORDS

Hyperparathyroidism;
Parathyroid glands;
Parathyroidectomy;
Chronic renal insufficiency;
Ultrasonography;
Scintigraphy

Abstract

Introduction: Hyperparathyroidism is an expected metabolic consequence of chronic kidney disease (CKD). Ectopic and/or supernumerary parathyroid glands (PT) may be the cause of surgical failure in patients undergoing total parathyroidectomy (PTX).

Aim: To define the locations of ectopic and supernumerary PT in patients with renal hyperparathyroidism and to correlate intraoperative findings with preoperative tests.

Materials and methods: A retrospective study was conducted with 166 patients submitted to PTX. The location of PT during surgery was recorded and classified as eutopic or ectopic. The preoperative localizations of PT found by ultrasonography (USG) and Tc99m-Sestamibi scintigraphy (MIBI) were subsequently compared with intraoperative findings.

Results: In the 166 patients studied, 664 PT were found. Five-hundred-seventy-seven (86.4%) glands were classified as eutopic and 91 (13.6%) as ectopic. Eight supernumerary PT were found. The most common sites of ectopic PT were in the retroesophageal and thymic regions. Taken together, USG and MIBI did not identify 56 (61.5%) ectopic glands. MIBI was positive for 69,7% of all ectopic glands located in the mediastinal and thymic regions.

Conclusion: The presence of ectopic and supernumerary PT in patients with renal hyperparathyroidism is significant. Although preoperative imaging tests did not locate most of ectopic glands, MIBI may be important for identifying ectopic PT in the mediastinal and thymic regions.

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PALAVRAS-CHAVE

Hiperparatireoidismo;
Glândulas paratireoides;
Paratireoidectomia;
Insuficiência renal
crônica;
Ultrassonografia;
Cintilografia

Localização de glândulas paratireoides ectópicas e supranumerárias em pacientes com hiperparatireoidismo secundário e terciário: descrição cirúrgica e correlação com ultrassonografia e cintilografia Tc99m-Sestamibi pré-operatórios

Resumo

Introdução: O hiperparatireoidismo é uma consequência metabólica esperada na doença renal crônica (DRC). Paratireoides (PT) ectópicas e/ou supranumerárias podem ser causa de falha cirúrgica nos pacientes submetidos à paratireoidectomia total (PTX).

Objetivo: Definir cirurgicamente a localização das PT, em pacientes com hiperparatireoidismo associado à DRC, correlacionar esses achados com os exames pré-operatórios.

Materiais e métodos: Foi conduzido um estudo retrospectivo com 166 pacientes submetidos à PTX. A localização das PT no intraoperatório foi registrada, sendo classificada como tópica ou ectópica. A localização pré-operatória, definida pela ultrassonografia (USG) e pela cintilografia Tc99m-Sestamibi (MIBI), foi comparada com aos achados cirúrgicos.

Resultados: Nos 166 pacientes, foram identificadas 664 PT. Foram classificadas como tópicas e ectópicas 577 (86,4%) e 91(13,6%) glândulas, respectivamente. Oito PT supranumerárias foram encontradas (7 tópicas e 1 ectópica). As localizações mais comuns de PT ectópicas foram as regiões retroesofágica e tímica. Associadas, a USG e a MIBI não identificaram 56 glândulas (61,5%) ectópicas. Entretanto, a MIBI foi positiva para 69,7% daquelas localizadas nas regiões tímicas e mediastinal.

Conclusão: A presença de glândulas ectópicas e supranumerárias em pacientes com hiperparatireoidismo associado à DRC é significativa. Os exames de imagem pré-operatórios não localizaram a maioria das glândulas ectópicas. A MIBI pode ter importância na identificação de PT nas regiões tímica e mediastinal.

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Introduction

Hyperparathyroidism is a physiological response to metabolic changes that occurs in patients with chronic kidney disease (CKD). In spite of advances in the clinical treatment of these patients, a significant number develops parathyroid (PT) hyperfunction and autonomy, with consequent elevation of parathyroid hormone (PTH). When the harmful effects of hyperparathyroidism are identified, such as severe bone disease, surgical treatment becomes necessary.¹

Thus, total parathyroidectomy (PTx) in CKD has been indicated in symptomatic patients with marked and non-suppressible elevations of PTH.¹ The goal of surgery is to correctly identify and resect all PTs. Although the hyperplastic glands are much larger than normal due to kidney disease, their identification is not always simple.^{2,3} Moreover, although the finding of four glands is expected in most patients, there is significant variability in the number of PTs. Supernumerary glands are present in 2.5% to 30% of patients,^{4,5} and may be the reason for surgical treatment failure, if not properly identified.^{2,6}

There is also considerable variation regarding the location of the PTs, which are often not found in their usual location. The identification of all glands may require a thorough exploration of the superior mediastinum regions, thyroid gland, carotid sheath, and retroesophageal area.^{5,7}

As a result, imaging studies have been performed to quantify and locate the PTs before surgery. However, although widely used in patients with CKD-associated hyperparathyroidism, it is not yet known whether ultrasonography (USG) and 99mTc-sestamibi (MIBI) scintigraphy can affect surgical outcomes, complication rates, and long-term therapeutic success.⁸⁻¹⁰

This study aimed to evaluate the main locations of the PTs in patients with secondary (SHPT) and tertiary (THPT) hyperparathyroidism, based on intraoperative findings, and to correlate these findings with the preoperative examinations.

Materials and methods

A cross-sectional study including patients with CKD treated at a tertiary referral hospital was performed. Between February of 2011 and October of 2012, 166 patients (44 diagnosed with SHPT and 122 diagnosed with THPT) underwent PTx with presternal parathyroid autotransplantation. All patients were examined by a nephrologist specialized in renal osteodystrophy; surgical indication followed the criteria of clinical treatment failure: hypercalcemia and/or persistent hyperphosphatemia; pruritus; bone pain; fractures or high risk of fractures; skeletal deformities and/or calcifications; calciphylaxis; and radiographic evidence of renal osteodystrophy. Patients who had previously undergone PT surgery were excluded from the analysis.

Patients were referred for surgical evaluation after preoperative imaging examinations had been performed at the service of origin or at the hospital in which the surgery was performed. USG and MIBI images reports from each patient were analyzed, the number of PTs observed, and their locations were quantified for each test. In cases where the MIBI image was not available for analysis by the surgeon, the examination report was considered. Preoperative imaging assessments were not performed by the same radiologist, nor in the same radiology department.

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