ABSTRACT

Objectives:
1) Describe the pathologic findings of water-clear cell hyperplasia and adenomas
2) Understand the clinical presentation of a patient with primary hyperparathyroidism caused by double water-clear cell parathyroid adenomas

Methods:
Case Report: A 66 year old Caucasian female was referred to our clinic with hypercalcemia, osteoporosis, and hyperparathyroidism. Sestamibi scan was non-localizing and thyroid ultrasound revealed bilateral thyroid nodules. She underwent total thyroidectomy and bilateral superior parathyroidectomy. The inferior parathyroid glands appeared grossly normal and were left intact.

Results:
Intraoperative PTH dropped from 209 to 39.5 and postoperative calciums returned to the normal range. Pathology revealed two water-clear cell parathyroid adenomas weighing 2.14 grams and the left weighing 1.27 grams. Both glands were consistent with water-clear cell parathyroid hyperplasia.

Conclusions:
WCC hyperplasia is a rare, but well documented cause of primary hyperparathyroidism that has decreased to less than 1% of primary hyperparathyroidism cases. This case demonstrates the use of intraoperative PTH with subsequent decrease suggesting bilateral parathyroid adenomas which were confirmed histologically. Although there is little difference between parathyroid adenoma and hyperplasia in terms of histologic findings, adequate treatment of primary hyperparathyroidism defined by normocalcemia at 6 months after surgery.

INTRODUCTION

Primary hyperparathyroidism is most commonly the result of a single parathyroid adenoma in 87% to 91% of cases. The incidence of primary hyperparathyroidism in the U.S. is 1 per 300 individuals. The vast majority of patients (87-91%) have a solitary adenoma, and many, parathyroid carcinoma. The reported presence of double adenomas ranges from 2% to 15% of hyperparathyroidism cases. The majority of parathyroid adenomas are of the chief cell type, but less common are relatively few of the oxyphil cell type identified. Water-clear cell adenomas of the parathyroid gland are relatively rare, eight known cases previously identified and composed of cells with vacuolated or glandular cytology. In contrast, water-clear cell hyperplasia is a well-documented cause of primary hyperparathyroidism but is anecdotally and the incidence has decreased significantly over the past seventy-five years to less than 1% of cases of primary hyperparathyroidism.

Bilateral Water-Clear Cell Double Parathyroid Adenomas
Brian Lawton, MD1; Shabnum Chaudhery, MD2; Cherie-Ann Nathan, MD,1
1Department of Otolaryngology – Head & Neck Surgery, 2Department of Pathology
Louisiana State University Health Sciences Center-Shreveport, LA

CASE REPORT

A 66 year old Caucasian female was referred to our clinic with mild hypercalcemia, osteoporosis, and hyperparathyroidism. Sestamibi scan was non-localizing and thyroid ultrasound revealed bilateral thyroid nodules. Fine needle aspiration of the thyroid revealed atypia and the patient was then referred to our clinic. The inferior parathyroid glands appeared grossly normal and were left intact due to the decrease of intraoperative PTH from 209 to 39.5 pg/mL. Postoperative calciums returned to the normal range and the patient did well postoperatively.

PATHOLOGY

The right and left parathyroid glands measured 2.5 and 2.0 and weighed 2.17 and 1.27 grams, respectively. Both parathyroid glands showed histologically similar lesions composed of uniform, diffractively clear sheets of clear cells with clear finely vacuolated cytoplasm (Figure 1). The cells were present in vast and separated by fine fibromyxovascular septa (Figure 2 and 3). Distinct cell membranes were present and the nuclei show minimal atypia, with finely stippled chromatin (Figure 4). The right parathyroid gland bled a minute of intraoperative saline.

DISCUSSION

WCC hyperplasia is a rare, but well-documented cause of primary hyperparathyroidism that has decreased to less than 1% of all patients undergoing surgical treatment of primary hyperparathyroidism. Interestingly, when first described by Atkinson in 1954, 12.8% of the 47 cases reported were consistent with WCC hyperplasia. Water-clear cell hyperplasia is characterized by proliferation of symmetrical clear cells in multiple parathyroid glands and represents the only known cause of primary hyperparathyroidism other than the inferior glands. Histologically, the appearance of water clear cell hyperplasia resembles normal chief cells. Light microscopy reveals diffusely proliferative sheets of clear cells, characterized by clear cytoplasm and small dense nuclei, and highly magnification reveals small clear vacuoles. To our knowledge only one other case has been reported that revealed bilateral water-clear cell parathyroid adenomas and total of eight cases reported revealing WCC adenomas. Our case demonstrates the use of intraoperative PTH with subsequent decrease suggesting bilateral parathyroid adenomas which were confirmed histologically. Although there is little difference between parathyroid adenoma and hyperplasia in terms of histologic findings, adequate treatment of primary hyperparathyroidism defined by normocalcemia at 6 months after surgery.

REFERENCES