Functioning Oxyphil Parathyroid Adenoma

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ABSTRACT

A hormonally active oxyphil adenoma of the parathyroid masqueraded as a thyroid nodule and was present as a palpable neck mass for more than six years prior to the onset of clinically obvious hyperparathyroidism. The slow evolution of the hyperparathyroidism in the presence of a relatively large adenoma was correlated with the presumptive low hormonal synthetic capacity of oxyphil cells that formed the bulk of the tumor.

Introduction

Parathyroid adenomas composed of oxyphil cells are, in most instances, hormonally inactive tumors, found incidentally at the autopsy of older people.2,6,9 Only 23 hormonally active oxyphil adenomas have been reported so far3,6 and all of those, with the exception of a 20 year old8 and 31 year old9 woman, were diagnosed in patients 40 years of age or older. The rarity of oxyphil adenomas in general and in young men in particular has prompted us to report the following case. The case is of additional interest because the tumor masqueraded as a cold thyroid nodule and presented as a palpable neck mass six years prior to the onset of clinically obvious hyperparathyroidism.

Case Report

In October 1978, a 21 year old white female complained of recent dysphagia, ostensibly owing to a lump on the left side of her neck. The patient has been aware of the neck mass for about six years. She was euthyroid and the only positive finding on physical examination was a soft one cm nodule attached to the left lobe of the thyroid. Thyroid imaging with technetium pertechnetate showed an apparent hypofunctioning area, corresponding to the palpable nodule on the lateral aspect of the left thyroid lobe. A tentative diagnosis of nonfunctioning thyroid nodule was made, and the patient was placed on suppressive therapy with 0.2 mg per day of L-thyroxine.
In July of 1979, the patient was hospitalized for an episode of right renal colic. Intravenous pyelography revealed a calcified stone, 3 mm in diameter, in the lower right ureter, causing moderate hydronephrosis and hydrourerter. A 24 hour urinary calcium excretion was found to be elevated to 387 mg (normal: 50 to 150). Other abnormal laboratory findings included alkaline phosphatase in the serum, 85 to 97 milliunits per ml (normal: 15 to 75); total serum calcium of 10.8 to 10.9 mg per dl (normal: 8.8 to 10.0); ionized serum calcium of 5.02 and 4.96 mg per dl (normal: 3.70 to 4.50); and serum parathyroid hormone (intact) 512 and 278 pg Eq per ml (normal: 163 to 347).5

In January 1980, the patient underwent surgery during which the palpable "cold nodule" was identified as a parathyroid adenoma, replacing the left upper gland, separate from but compressing the mid-portion of the left lobe of the thyroid. The thyroid and the remaining three parathyroids were unremarkable. The postoperative course was uneventful. After the operation, all the laboratory findings were within normal limits including serum calcium, phosphorous and parathormone.

The surgically resected tumor measured $1.8 \times 1.7 \times 0.8$ cm and weighed 2.3 g. It was encapsulated, brownish-gray on cross section with a small area of cystic degeneration in the center. Histologically, the tumor was composed of uniformly polygonal cells displaying round nuclei and eosinophilic granular cytoplasm (figure 1). Portions of the compressed parathyroid gland were identified in the connective tissue capsule surrounding the adenoma.

Electron microscopic examination of the adenomatous nodule was performed on formalin fixed tissue. Despite suboptimal fixation, the examination revealed that the tumor was composed almost exclusively of mitochondria-rich, typical oxyphil cells (figure 2) and transitional oxyphil cells. No chief cells were identified. The cytoplasm of the oxyphil cells contained densely packed mitochondria and few other organelles. In the transitional cells, the mitochondria were less densely packed and the cells contained more rough and smooth endoplasmic reticulum, prosecretory and secretory granules than the oxyphil cells. In many instances, the distinction between typical and transitional oxyphil cells was not clear cut, and many cells were classified as intermediate.

Comment

The relatively slow clinical evolution of hyperparathyroidism in the presence of a
palpable parathyroid adenoma for six years can, in retrospect be explained by the histologic and ultrastructural findings of oxyphil cell predominance in the tumor. Oxyphil cells are considered to be hormonally inactive.\textsuperscript{4,7} Since these cells formed the bulk of the tumor, it is no surprise that the symptoms of compression, owing to the size of the tumor, appeared sooner than the signs of hyperparathyroidism. The preoperatively found elevated levels of parathyroid hormone in the serum, coupled with the return into the normal range after the removal of the tumor, indicate nevertheless that the tumor was hormonally active. It was, however, not possible to determine whether the excess of parathormone stemmed from the typical oxyphil cells that predominated in the tumor or from the transitional cells which were in the minority.

The present tumor was initially diagnosed as a palpable thyroid nodule. This impression was further supported by the technetium scan which was interpreted as "cold thyroid nodule." Others have reported parathyroid adenomas, presenting as cold thyroid nodules on $^{131}$I scintiscans. Our data confirm the report of Alagumalai et al\textsuperscript{1} that technetium imaging may yield identical results. The growth of the apparently "cold thyroid nodule," despite suppressive therapy, has even raised the question of potential malignancy, but the dilemma was resolved upon the appearance of the thyroid during surgery. Our case should thus serve as a reminder that parathyroid adenomas may present clinically as "cold thyroid nodules."

\section*{Acknowledgment}

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\section*{References}

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