Primary parathyroid hyperplasia

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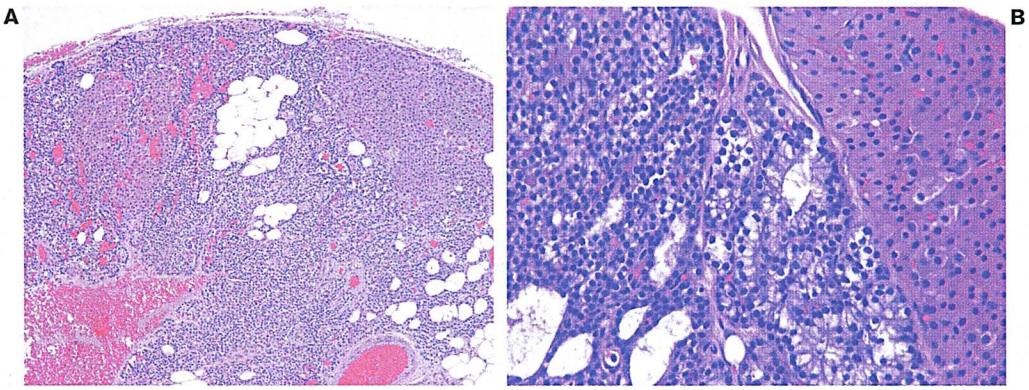

*Figure. **A:** Intermediate-power view shows areas of oxyphilic cells (pink) interspersed with chief cells. There is a decrease in the amount of stromal fat. No atrophic or uninvolved parathyroid parenchyma is seen. **B:** High-power view illustrates an increased nucleus-to-cytoplasm ratio as well as an increase in both the oxyphilic-cell and the chief-cell compartments.*

Parathyroid hyperplasia is classified as either *primary*, *secondary*, or *tertiary*. Primary parathyroid hyperplasia occurs in approximately 15% of patients with hyperparathyroidism. Most cases are sporadic, and they usually occur in patients who are middle-aged and older. Approximately 20% of all cases of primary chief-cell hyperplasia are associated with one of the multiple endocrine neoplasia syndromes. Symptoms are referable to the level and duration of serum calcium elevation, although routine biochemical testing has led to an increase in the identification of asymptomatic patients. Biochemically, ionized serum calcium levels are elevated, and serum phosphorus concentrations are lowered. Technetium-99m sestamibi imaging successfully localizes as many as 60% of hyperplastic glands, although this technique is significantly more effective in localizing adenomas and carcinomas. Therefore, at least two glands should be examined histologically to confirm the diagnosis.

Macroscopically (in situ), the parathyroid glands can appear to be normal or grossly enlarged. All glands can be affected equally, but the enlargement is usually asymmetric, resulting in a "dominant" gland. Microscopically, the glands are nodular, and examination will identify an increase in parenchymal-cell mass, composed of chief cells and/or oxyphilic cells (figure). The amount of stromal fat is remarkably decreased or altogether absent, which results in an increase in the proportion of parenchymal cells to stromal fat cells. All sampled parathyroid tissue is abnormal, although to a variable degree. The features that are sometimes most helpful in identifying the sample's contents are those that are absent—that is, no obvious fibrous capsule; no uninvolved, compressed, or atrophic rim; no "glandular" architecture; no prominent nucleoli; and no increased mitotic activity.

Performing subtotal parathyroidectomy—that is, completely removing three glands and leaving a small remnant of the fourth—is the treatment of choice, although autotransplantation of parathyroid tissue remnants in the forearm has also been advocated. Recurrent hyperparathyroidism can occur in 15 to 20% of patients.

Suggested reading

DeLellis RA. Primary chief cell hyperplasia. In: DeLellis RA, ed. Tumors of the Parathyroid Gland. 3rd series, fascicle 6. Washington, D.C.: Armed Forces Institute of Pathology, 1991:65-92.

Kebebew E, Clark OH. Parathyroid adenoma, hyperplasia, and carcinoma: Localization, technical details of primary neck exploration, and treatment of hypercalcemic crisis. Surg Oncol Clin N Am 1998;7: 721-48.

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