

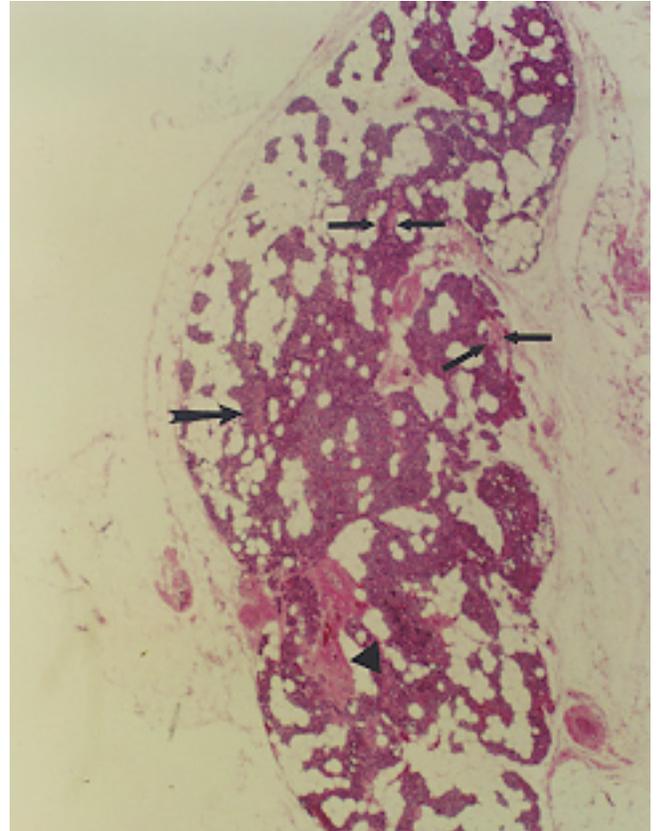
## PARATHYROID

The parathyroid, bean-shaped glands, are closely associated with the thyroid and usually these are round, although sometimes additional parathyroid tissue is located elsewhere in the neck or mediastinum and as many as 12 parathyroid glands have been noted. The lower two glands are adjacent to the inferior thyroid arteries while the upper two appear adherent to the upper posterior aspect of the thyroid capsule. They are about the size of a grain of cooked rice. The glands are richly vascularized.

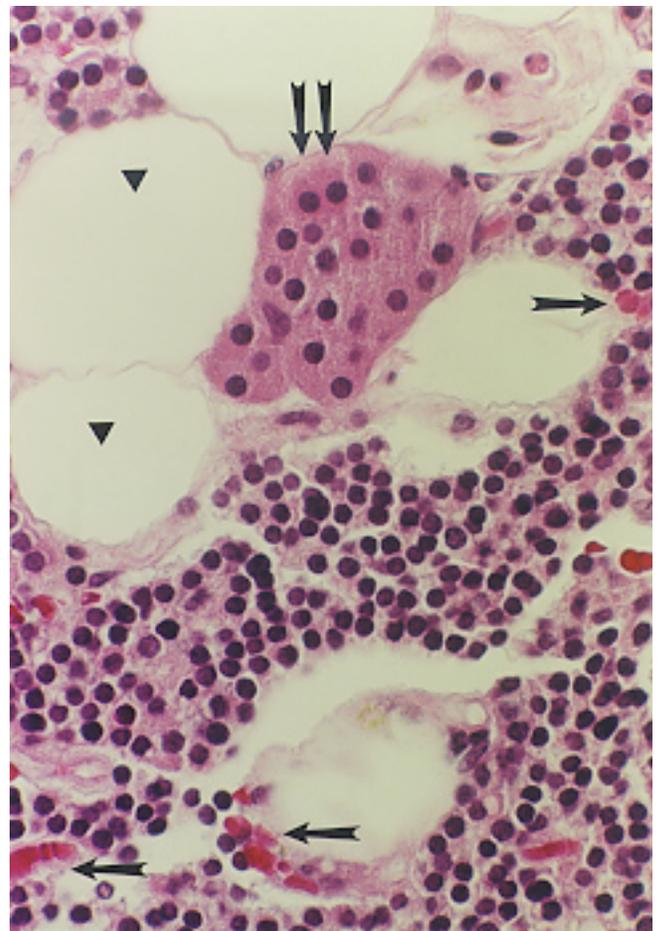
There are two types of cells: chief (principal) cells and oxyphil or oncocytic cells. Parathyroid hormone is elaborated by the chief cells, the most abundant cells in the gland. They have a darkly prominent, round, centrally positioned nucleus and relatively little cytoplasm. Many chief cells appear vacuolated. Oxyphil cells are larger than chief cells and occur in clumps. When there are large oxyphilic nodules in the normal gland the condition may be difficult to distinguish from adenoma. The cytoplasm of oxyphilic cells is granular and strongly eosinophilic (oncocytic appearance) and the nuclei smaller than those of chief cells. They are sparse until puberty. Their function is poorly understood and they do not secrete hormones except in pathologic conditions such as adenoma and hyperplasia.

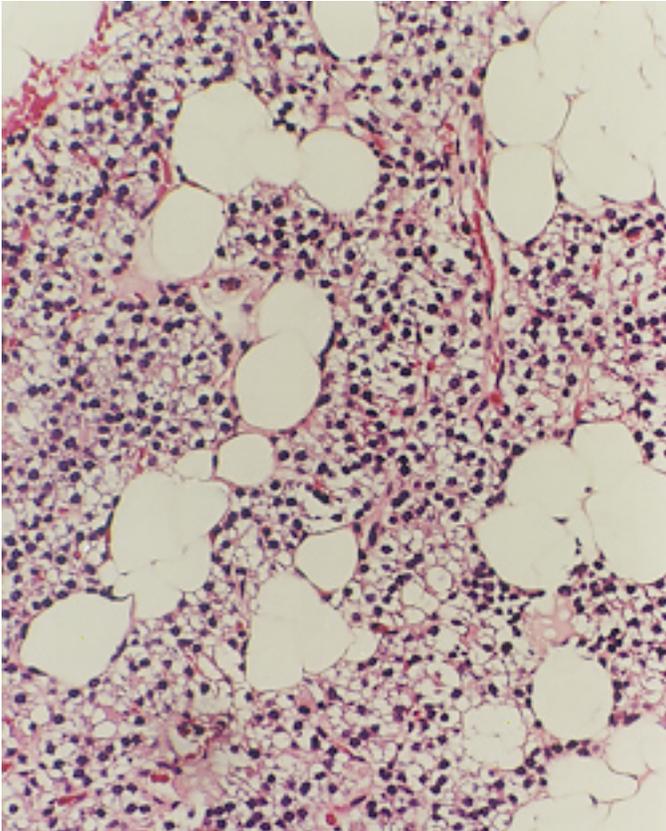
Stromal fat is a prominent part of the adult parathyroid, so much so that it becomes an identifying characteristic, whereas in children there is much less fat. The fat content of the parathyroid varies with many factors such as nutrition, malignancy and genetics and in any case is highly variable from individual to individual and even varies among the glands of the same person.

Parathyroid, normal, 69 year old woman. As seen here, fat is a distinguishing feature of the normal parathyroid gland. Chief cells predominate (large arrow) with only tiny islands of oxyphil cells scattered throughout the gland (double arrows). Larger areas of eosinophilic staining represent fibrous septa (triangle).

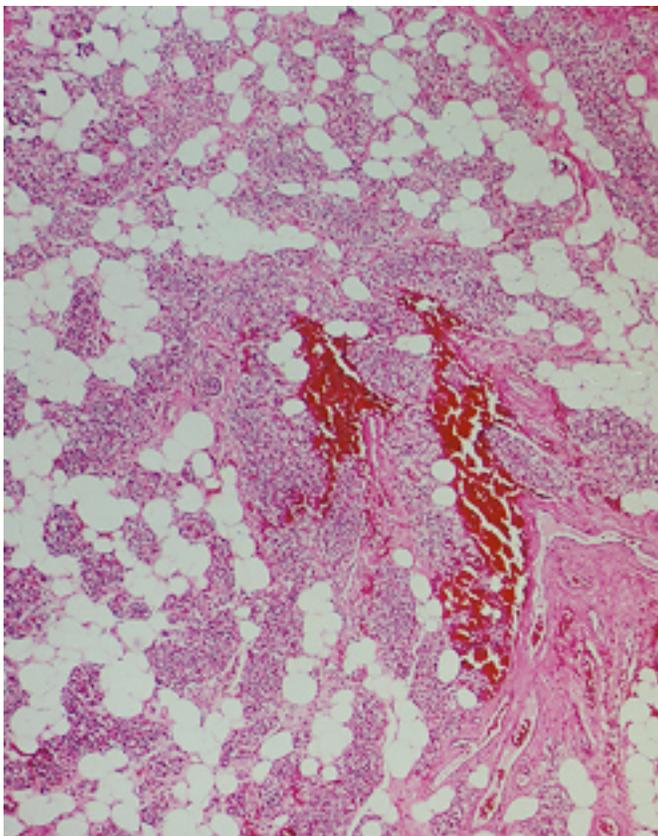


Parathyroid, a small clump of oxyphil (oncocyctic) cells with granular eosinophilic cytoplasm (double arrows). The adjacent chief cells are slightly basophilic and smaller than the oxyphilic cells and their nuclei are darker. Fat (triangles) is one of the identifying features of the parathyroid. There are many blood vessels in the parathyroid (single arrows).





Parathyroid. Note the heavy fat content and the septa with blood vessels. If there is need for greater production of parathormone the endocrine cells undergo hyperplasia and the fat decreases. Only chief cells are seen here.



Parathyroid, showing chief cells with a vacuolated or cleared appearance due to high glycogen content ("Wasserhelle" cells).