
Adenoma, Pars Intermedia, Pituitary, *Macaca mulatta*

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**Synonyms.** Chromophobe adenoma; endocrine inactive adenoma; nonfunctional adenoma; null cell adenoma.

**Gross Appearance**

An example of a pituitary adenoma in a male rhesus monkey (*Macaca mulatta*), more than 13 years old, was described in an earlier report (Chalifoux et al. 1983). The adenoma was a roughly spherical mass measuring 1.2 cm antero-posterior, 1.8 cm dorsoventrad, and 1.8 cm in width, located at the site of the pituitary, and attached to the hypothalamus. When cut, it was cystic and contained mucinous material. Both mammary glands and a left supernumerary mammary gland in this male monkey were about 3 cm in diameter, yellowish, and conspicuous as seen from the deep surface. On sectioning, cysts were visible and milk exuded from the cut surface. There was also ankylosing spondylitis involving all vertebrae.

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Fig. 230. Adenoma, pituitary, male *Macaca mulatta*. Sagittal section of entire tumor. Pars nervosa is thin band (arrow). Darker staining cells underlying this band are morphologically normal cells of the adenohypophysis (arrowheads). Ends of smaller piece were attached to mass forming a circle (point A to point A and B to B). Space (S) was occupied by adenoma and colloid. C, colloid; N, neoplastic cells. (From Chalifoux et al. 1983 Vet Pathol 20:541–547) x5.8

**Microscopic Features**

A low magnification of a sagittal section of the tumor is shown in Fig. 230. The pars nervosa was flattened and compressed and a thin capsule surrounded the mass. The tumor was cystic and contained uniformly pink-staining colloid with most cells pushed to the periphery and some embedded in the colloid. The empty space to the right in the figure had been occupied by a mass of cells similar to those comprising the remainder of the tumor. It had its own capsule and became detached from the section during processing.

Adjacent to the pars nervosa there were compressed aggregates of cells consistent with normal acidophils. The remaining cells had pale, pink-purple, agranular cytoplasm characteristic of chromophobes and exhibited three different patterns of growth. Some appeared to be forming sinusoids (Fig. 231) and others were arranged in follicles containing pink colloid material (Fig. 232). Still others were less organized and were present in diffuse sheets (Fig. 233). Many of these cells were pyknotic. Foci of calcification and cholesterol clefs associated with old hemorrhage were present.

Pituitary adenomas tend to expand and may compress and penetrate adjacent structures (DeLellis 1989). However, this behavior does not imply malignancy unless there are distant metastases. In a few areas of this tumor neoplastic cells appeared to be invading the pars nervosa (Fig. 234).

The mammary glands were hyperplastic and cystic and spermatogenesis was arrested at the spermatid stage in the seminiferous tubules of the testis. Amyloidosis was severe in the liver and also present in the spleen, adrenal, and small and large intestines.

**Ultrastructure**

The neoplastic cells were roughly polygonal with large round or slightly indented nuclei. Most contained few granules but a few were more heavily granulated. The secretory granules within the cytoplasm of the cells containing many granules measured 600–700 nm, which is within the size range of lactotrophic granules (Fig. 235). Granules in the sparsely granulated cells were of various sizes, measuring 200–500 nm, and were slightly variable in density (Fig. 236).

**Immunohistochemistry**

Some chromophobe adenomas which have few or no visible secretory granules may still secrete hormone and these may be identified by im-