

An Incidentaloma of Pituitary Gland in Cadaver - A Clinical Correlate

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Abstract

Background: The pituitary gland is located at the base of the brain in the pituitary fossa and weighs about 0.5gm. The pituitary gland is often referred to as the “master gland” and is the most important endocrine gland in the body because it regulates vital hormone secretion. Pituitary adenomas are present in approximately 10-15% of persons in the general population on imaging studies or at autopsy. Less than one percent adenomas found during autopsy are macro adenomas.

Case Report: An enlarged pituitary mass of weight 25gms was found in embalmed female cadaver of age 65 yrs old during routine dissection in area of Sella turcica. Dimensions of the pituitary gland were found 30mm x 10.5mm x 20mm (Cranio-caudal x transverse x Anteroposterior) signified it as macro adenomas (>10mm)

Histopathological examination of the pituitary showed an encapsulated tumor composed of round to oval cells arranged in sheets and nests with intervening fibro muscular stroma showing moderate amount of

cytoplasm, uniform nuclei with stippled chromatin and inconspicuous nuclei consistent with Pituitary adenoma or Pituitary neuroendocrine tumor.

Conclusion: To conclude about pituitary adenoma, these macro adenomas can compress optic chiasma leads to affect the eye sight, Hormonal imbalances, extend into cavernous sinus associated with compression of cranial nerves and impaired cognitive function. This report could be useful for Neurophysicians and Neurosurgeons to determine the way of therapeutic approach for such tumor by knowing their size, expansion and histopathological findings. In this aspect, Clinical case studies will get better diagnostic and treatment of patients having pituitary adenoma, making them extremely helpful for advancement of medical Sciences

Keywords: Pituitary Adenomas, Sella Turcica.

Introduction

The pituitary gland also referred as “master gland” of the body is located at the base of the brain below the hypothalamus surrounded cranially by optic chiasma and caudally by sphenoid bone in Sella turcica³ covered by

diaphragma sellae having size of 2-8mm and weighs no more than half a gram. It is connected to the hypothalamus by infundibular stalk.

The pituitary gland is the most important endocrine gland in the body because it regulates vital hormone secretion, responsible for control of body growth, reproduction, metabolism and blood pressure.¹

Anatomically, the pituitary gland is divided into three lobes, anterior, intermediate and posterior lobes. Pituitary adenomas arise from the anterior lobe of the pituitary gland.

These pituitary masses are classified according to size into microadenoma (<10mm) and macroadenoma (>10mm). Further, they are classified Functional and Nonfunctional depending upon the secretion of hormones.²

Pituitary tumours lead to dilatation of the Sella turcica and corrosion of the clinoid edges and damage the chiasm or optic nerve resulting in reduced vision.⁴ Pituitary adenomas are benign tumors that arise from one of the five cell types that comprise the anterior pituitary (lactotrophs, gonadotrophs, somatotrophs, corticotrophs and thyrotrophs). Pituitary adenomas are true neoplasms with a monoclonal cell origin. Hyper secretion or diminished inhibition of the hormones of the hypothalamic-pituitary axis can lead to the constellation of endocrine symptoms often seen in patients with pituitary adenomas.³

Anatomical measurements of pituitary adenoma and their expansion into surrounding areas could be helpful for neurosurgeons and clinicians to make standard guidelines to approach the adenoma for surgical removal. The sign and symptoms produced by compression or invasion of surrounding structure provide baseline data for physician to make suitable guidelines for treatment of pituitary adenoma.

Case Report

During routine gross dissection at Dissection Hall of Employee State Insurance Medical College and Hospital (ESIC MCH), Faridabad, Haryana at a female cadaver of age 65 yrs. old, after removal of brain from the cranial cavity, an enlarged mass was found in the Sella turcica which was protruding out of the space superiorly as shown in figure 1.

In this case study, Pituitary gland of size 30mm x 10.5mm x 20mm (Craniocaudal x transverse x Anteroposterior) weighing 25gms was found (fig:2) signified it as macro adenomas (>10mm). (Normal weight of pituitary is 0.5gms and size is 2-8mm)



Fig.1: Pituitary Gland in Sella Turcica



Fig. 2: Gross morphology

The pituitary was compressing upon optic chiasma/ Optic Nerve present above and exerting pressure on structure around i.e. cavernous sinus, internal carotid artery

The histopathological examination of the specimen showed an encapsulated tumor composed of cells arranged in sheets and nests with intervening fibrovascular stroma, these cells are round to oval with moderate amount of cytoplasm, uniform nuclei with stippled chromatin and inconspicuous nucleoli as shown in Figure 3A, 3B, 3C, 3D, 3E at different magnification. It is consistent with Pituitary adenoma or Pituitary Neuroendocrine tumor.

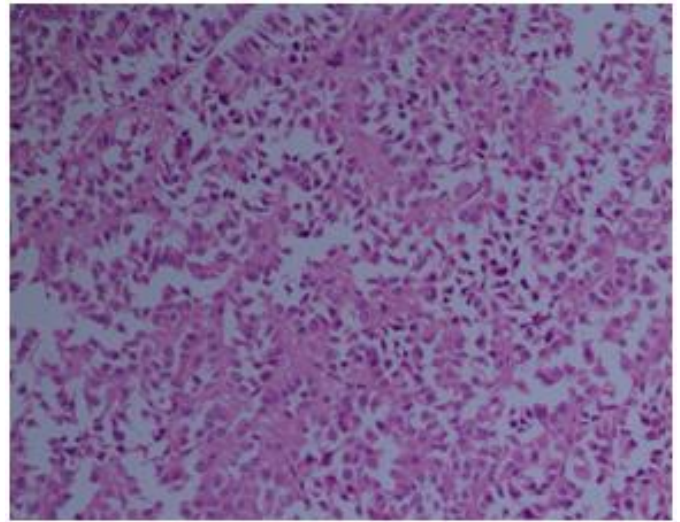


Fig. 3C: 200X

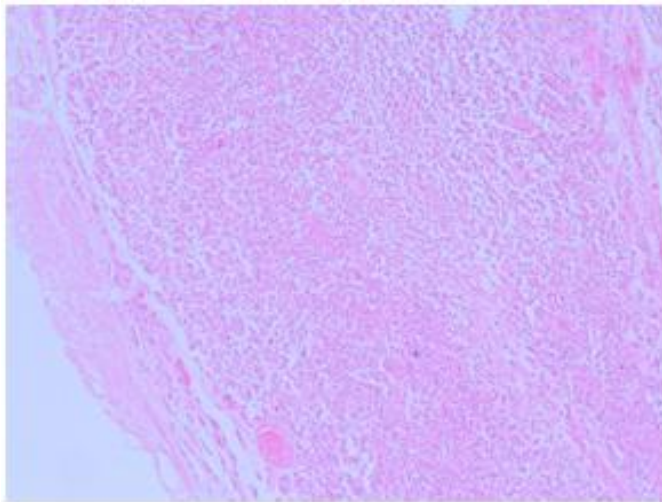


Fig. 3A: 40X

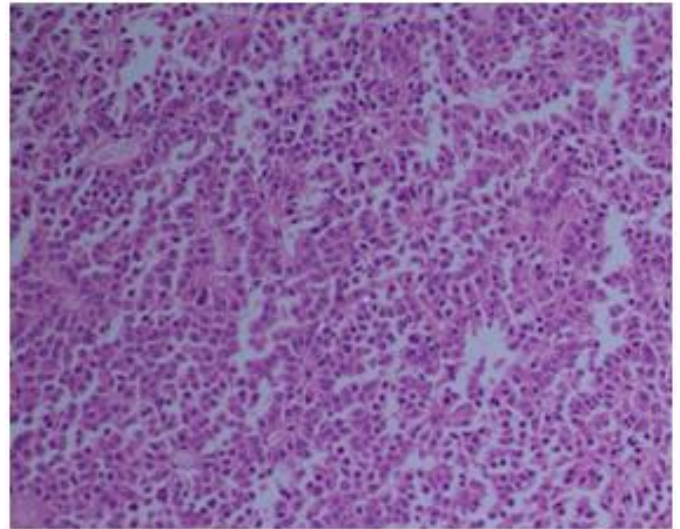


Fig. 3D: 200X

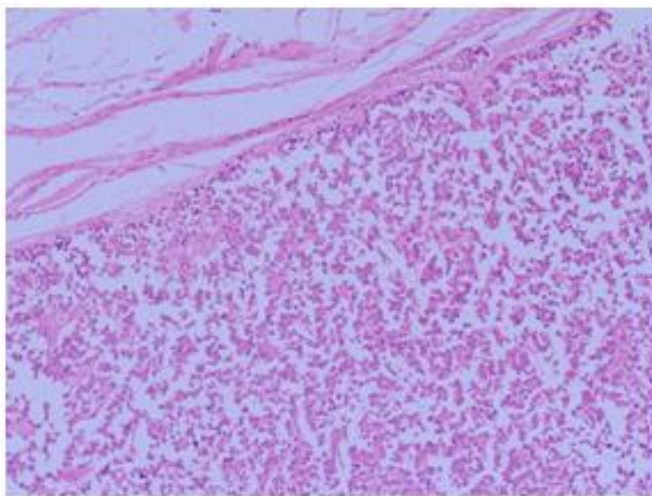


Fig. 3B: 100X

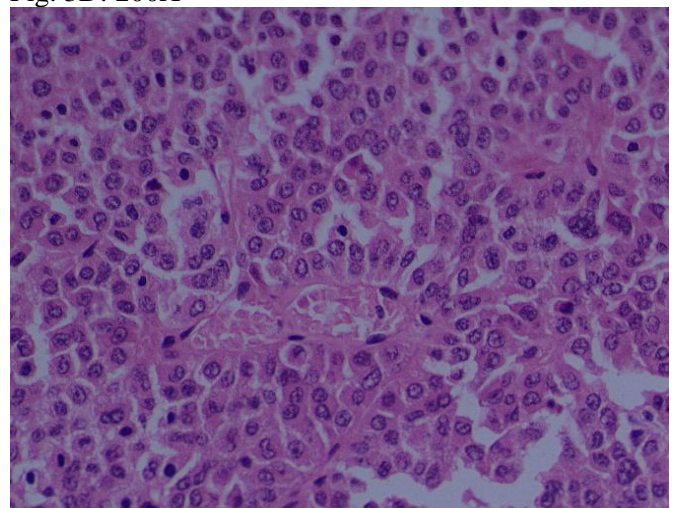


Fig. 3E: 400X

Discussion

The pituitary gland is the about the size of a pea (two to eight millimeters in diameter) and weighs about 0.5 g. It is located within the Sella turcica of the sphenoid bone at the base of the skull and is covered by a dural fold (diaphragma sellae).⁵

Pituitary adenomas account for approximately 10% of all CNS tumors. Recent data suggest that approximately 40% to 66% of all PAs are prolactinoma, 14% to 43% are non-functional pituitary adenoma, and the rest are either GH-secreting adenomas or ACTH-secreting adenomas.

Pituitary Gland adenoma is more common in females. Incidence of pituitary adenoma in approximately 10-15% of persons in the general population but it is uncertain because of regional variation in prevalence of pituitary adenoma. An incidence rate of 35% was extracted from the study by Burrow et al.⁸ Whereas prevalence of pituitary adenoma was found to be 16.7% in a study conducted by Ezzat et al.⁷. The rate of pituitary tumors detected at autopsy is even higher, reaching 41.8%–71.0% in a study conducted by Liang L et al.¹¹

Histologic examination of the pituitary gland is acknowledged to be considerably more sensitive for detecting pituitary adenomas.⁹

In present case study, histopathology of specimen showed an encapsulated tumor composed of round to oval cells arranged in sheets and nests with intervening fibromuscular stroma showing moderate amount of cytoplasm, uniform nuclei with stippled chromatin and inconspicuous nuclei (Fig. 3). In a study conducted by Asa SL et al.¹⁰, they found the various cells of pituitary (Somatotrophs, Lactotrophs, Gonadotrophs adenomas) with scattered cells and inconspicuous nuclei with H&E staining.

A number of important structures surround the pituitary gland. The optic chiasm lies about 10 mm above it. The

cavernous sinuses contain cranial nerves III, IV, VI, V1 (ophthalmic) and V2 (maxillary) and the internal carotid arteries are on either side of it.⁵

Pituitary adenoma invade these surrounding structures produces various signs and symptoms. Involvement of optic chiasma leads to affected eye sight, cognitive impairment and expansion of these adenoma in cavernous sinus leads to affect the cranial nerves and internal carotid artery. In a study conducted by Agakhani K et al.⁴, diagnosis of adenoma was made based on the proliferation of the endocrine cells with diffused, sinusoidal, or papillary growth pattern, loss of normal structure of acinar and stromal cells, and compression of the parenchymal tissues adjacent to the pituitary gland.

Surgical resection is the mainstay treatment for pituitary adenoma and may be performed via various routes, most commonly by transcranial (Trans frontal and transpterial) and transsphenoidal approaches. Owing to the complexity of the anatomic structures around the pituitary and surgical pathways, complication can still occur during and after operation, some of which can be serious and even fatal. Thus, it is extremely important for neurosurgeons to have firm knowledge about the regional anatomy involved in various resection approaches for pituitary tumor.

Conclusions

The present case study provides essential anatomic measurements of the pituitary adenoma as well as histopathological features of pituitary adenoma. These macroadenomas can get expand into surrounding areas leads to compression of optic chiasma affect eye sight, Hormonal imbalances, extend into cavernous sinus associated with compression of cranial nerves and impaired cognitive function.

Gross measurement, expansion and microscopic study of such macroadenoma with clinically relevant features can

offer guidance to clinicians and Neurosurgeons to approach for medical and surgical management of the patients. Moreover, the application of a rational approach to the Immunohistochemical analysis of these lesions can be helpful to evaluate pathogenetic and prognostic markers and to predict response to specific therapeutic modalities in future.

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