Evaluation of Surgical Removal of Pituitary Tumours By Trans-sphenoidal Approach

Thesis
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M.Sc. (General Surgery)

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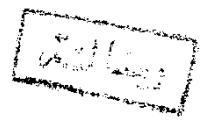

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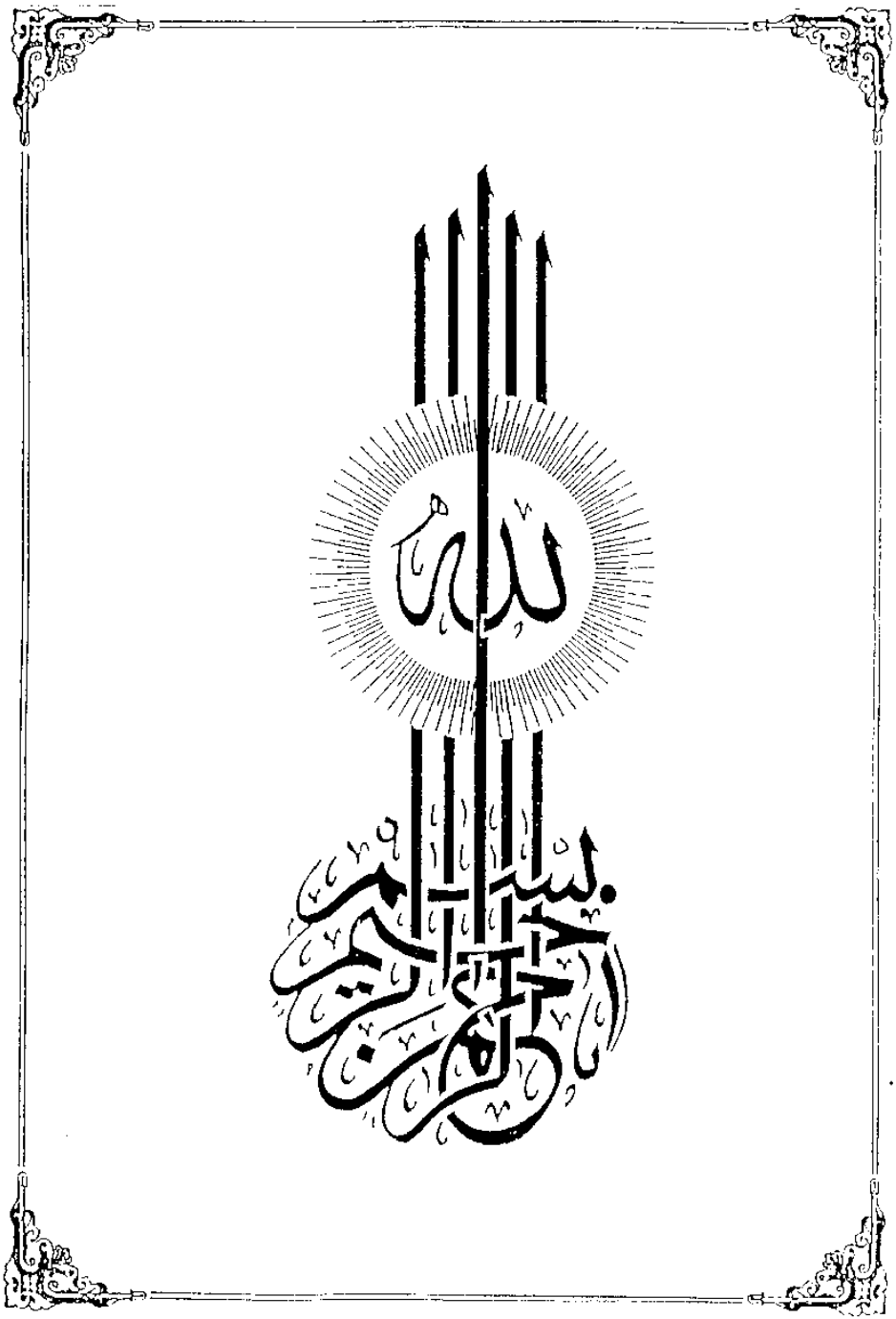

To

My

Parents

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Introduction

Introduction & Aim of The Work

Pituitary adenomas are frequently occurring epithelial neoplasms composed of and deriving from adenohypophyseal cells. They represent approximately 10% of intracranial tumours. In the majority of cases, they are benign and slow growing. However, some tumours exhibit a more rapid growth rate and invade the surrounding structures.

Pituitary adenomas are either secreting adenomas or nonfunctioning adenomas. The secreting adenomas produce hormonal disturbances which is reflected on the physiological functions of the body. The nonfunctioning adenomas presented by mass effect with chiasmal compression and subsequent visual troubles.

The goals of surgical intervention in pituitary adenomas are to remove the tumour, relief chiasmal compression and correction of endocrinopathy. While the surgical management of pituitary adenomas continues to be a safe and effective method for dealing with a large number of these lesions, the trans-sphenoidal approach had proved to be more physiologic, more tolerated and safer than the cranial approach. Among the different routes to

the sphenoid, the trans-septal route is the most direct, atraumatic and easiest of all of them. Our experience in the trans-septal approach for treating patients with pituitary adenomas of different types and sizes is discussed.

Review

Of

Literature

I-Embryology

The human pituitary gland is divided into two lobes, the anterior lobe or adenohypophysis and the posterior lobe or neurohypophysis. Although each has a distinct embryological origin, the two lobes become intimately related during embryogenesis and remain so (Tindall and Barrow, 1990).

Between the third and fourth weeks of embryonic development, a longitudinal groove, "the sulcus limitans" appears in the lumen of the neural tube. This sulcus divides the alar (dorsal) plate from the basal (ventral) plate. The basal plate plays no part in the development of the hypothalamus or pituitary, participating only in the formation of nervous tissue caudal to the diencephalon. At about five and a half weeks the alar plate in the region that gives rise to the diencephalon, develops a longitudinal groove contiguous with the sulcus limitans, this groove the "hypothalamic sulcus" divides the alar plate into a dorsal portion that gives rise to thalamus and ventral portion that gives rise to the hypothalamus (Cooper and Martin, 1990).

During the fifth week of gestation, a midline diverticulum "Rathk's pouch" forms as an outgrowth of the primitive

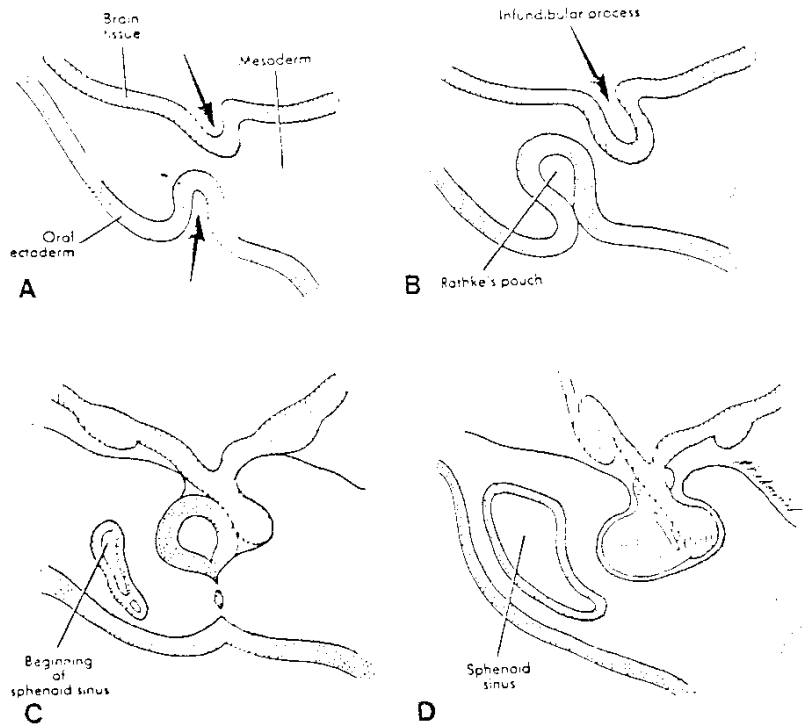

Fig (1) Embryogenesis of pituitary gland. (A), Early invagination of primitive stomodeum and infundibular process. (B) Growth of mesoderm Constricts Rathke´s Pouch. (C) Further development pinches off Rathke´s pouch from oral cavity. (D) Rathke´s Cleft components develop into the pars distalis, pars tuberalis, and possibly the pars intermedia. Infundibular process develops into infundibular stalk and pars nervosa (From Tindall, Barrow, 1986).

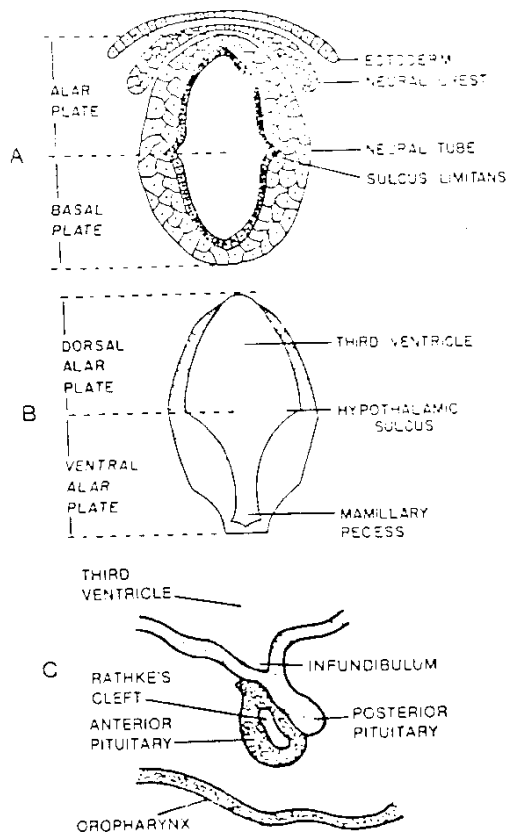

Fig (2) "A" Cross section of a human embryo (3.5 weeks) through the first Cervical somite. "B" Cross Section of a human embryo (5.5 weeks) in the region of the diencephalon. "C" Midsagittal Section of the hypothalamus of a human embryo (11 weeks).

stomedium, and grows cranially toward the neural tube to form the craniopharyngeal duct. The proximal portion of this duct is obliterated by the twelfth week of gestation and loses its connection with the oral cavity. Proliferation of the distal anterior wall of Rathk's pouch forms the pars distalis which makes up most of adult adenohypophysis. The posterior wall of Rathk's pouch, becomes the intermediate lobe, which is largely vestigial in adult humans. A thin layer of anterior pituitary cells the pars tuberalis, surrounds the lower end of pituitary stalk, and extends a short distance above the diaphragma sellae.

The posterior pituitary is formed early in embryogenic life from a down pouching of the diencephalon in the floor of the third ventricle, the upper portion fuses to become the pituitary stalk, and distal end enlarges to become the neurohypophysis (Tindall and Barrow, 1990).

Residual cells of craniopharyngeal duct persist in the posterior lobe of the pituitary, the hypophyseal stalk, and the basi-sphenoid. These are generally thought to be the origin of the tumour (craniopharyngeoma). Superior pharynx in infants, and adults almost always reveals a pharyngeal hypophysis at the buccal end of craniopharyngeal duct, it is composed mainly of