Treatment modalities of Craniopharyngioma

Review of literature

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بسم الله الرحمن الرحيم

Dedication

To the soul of my father
You are the one to whom I owe everything.
You encouraged me all the way long.
I wish you were here to see your dream come true.

To my mother,
The sun of my life,
The giver of endless love, deep faith and prayers,
Without your blessings, I'm nothing!

To my brothers and sister
Ahmad, Osama and Eman
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Introduction

"There is perhaps no other primary brain tumour that evokes passion, emotion, and as a result, controversy than does the craniopharyngioma" ***(Gleeson et al, 2008)***.

Craniopharyngiomas are slow-growing, benign, locally invasive intracranial tumours that can generate considerable morbidity and recurrences are often difficult to manage. As reliable morphologic criteria for accurately predicting the clinical outcome of these tumours is lacking, it has challenged the neurosurgeon and his skills for years. These tumours have a very intricate relation with the hypothalamus, pituitary stalk and optic apparatus, which have caused excessive problems regarding optimal management. Even now, no consensus exists in the optimal management of these patients ***(Kato et al, 2008)***.

One of the earliest descriptions of a craniopharyngioma is credited to ***Zenker***, who in an 1857 autopsy study recognized a suprasellar lesion containing cholesterol crystals. Extensive study by ***Luschka*** of the squamous epithelial cells in the adenohypophysis followed in1860. The significance of these findings was not initially recognized, and for many decades they remained overlooked ***(Karavitaki et al., 2006).***

In 1892, ***Onanoff*** coined the term *pituitary adamantinoma* after appreciating the similarities between tumors of the jaw and tumors of the pituitary region. In 1899, pathologists ***Mott*** and ***Barrett*** began to investigate a group of epithelial-type tumors that occupied the sellar region.

They postulated that these tumors arose from either Rathke's pouch or the hypophyseal duct. In the next few years, these tumors were reported by both ***Babinski*** and ***Frohlich*** as suprasellar lesions without acromegaly ***(Mehta and Black, 2004).***

In 1902, ***Saxer*** reported a tumor consisting of these cells. Two years later, ***Erdheim***, after a systematic study of the squamous epithelial cells in the adenohypophysis, described them only in the glands of adult patients, usually on the anterior surface of the infundibulum and in groups or islets of variable size, shape, and number. Because a few of these groups of cells contained small cysts similar to some pituitary tumors unnamed at that time, he was convinced that both lesions had the same origin and called them *hypophyseal duct neoplasms*. Interestingly, he did not find any cell rests along the route of the regressed craniopharyngeal duct, a discrepancy explained by ***von Mihalkovitcs'*** theory that the developing adenohypophysis underwent a forward andupward rotation carrying with it the cranial insertion of the gland. Similar observations on clumps of cell rests were later published by ***Duffy***, ***Kiyono***, and ***Carmichael***, but it wasn't until 1932 that squamous epithelial cells were also detected in the pituitary glands of childhood populations by ***Susman (Karavitaki et al., 2006).*** Different terminologies were used for these tumors (including hypophyseal ductor craniopharyngeal duct or Rathke's pouch tumors, interpeduncular or dysontogenetic or suprasellar or craniobuccal cysts, suprasellar epitheliomas and adamantinomas), until 1932, when the name "craniopharyngioma" was introduced by ***Cushing***. Commenting on the new terminology, ***Cushing*** wrote:

"This admittedly somewhat cumbersome term has been employed for want of something more brief to include the kaleidoscopic tumors, solid and cystic, which take their originfrom epithelial rests ascribable to an imperfect closure of the hypophyseal or craniopharyngeal duct" ***(Karavitaki et al., 2006).***

This term is now well entrenched in the neurosurgical literature, although embryologically, these tumors are remnants of the primitive stomodeum and not the pharynx ***(Mehta and Black, 2004).***

The first attempt for surgical removal of craniopharyngioma was credited to ***Halsteadt*** who performed transsphenoidal surgery for a patient with symptoms of a sella mass, in 1909 ***(Karavitaki et al., 2006).***

The surgical philosophy regarding the treatment of craniopharyngiomas has vacillated significantly over the last 5 decades. Early operative series demonstrated an extremely high mortality rate of 40%, with only 15% of patients undergoing total removal. By the early 1960s, many felt that aggressive surgery should be abandoned in favor of cytoreduction combined with radiotherapy. In mid-1970s, with improvements in both postoperative endocrinologic care and overall surgical technique, there was renewed support for an aggressive surgical approach. Even today, controversy exists between those who advocate aggressive surgical resection and those who support a more conservative approach ***(Mehta and Black, 2004).***