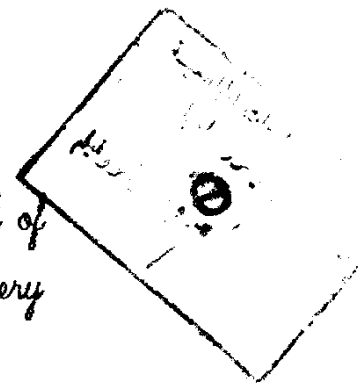
An Update Review of Classification and Management of Parotid Tumours

An Essay

Submitted for Partial Fulfilment of
Master Degree in General Surgery



By

Mahmoud Ahmed Gad

(M.B., B. Ch.)

Supervised by

Prof. Dr. Hussein Abdel Alim Boshnak

Assist. Prof. of General Surgery

Faculty of Medicine

Ain Shams University

Prof. Dr. Fateen Abdel Moneim Anous

Assist. Prof. of General Surgery

Faculty of Medicine

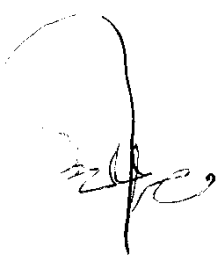
Ain Shams University

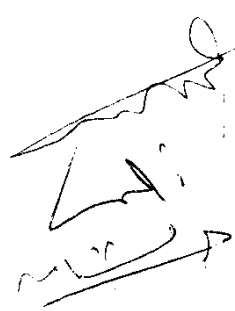
Department of Surgery

Faculty of Medicine

Ain Shams University

1993

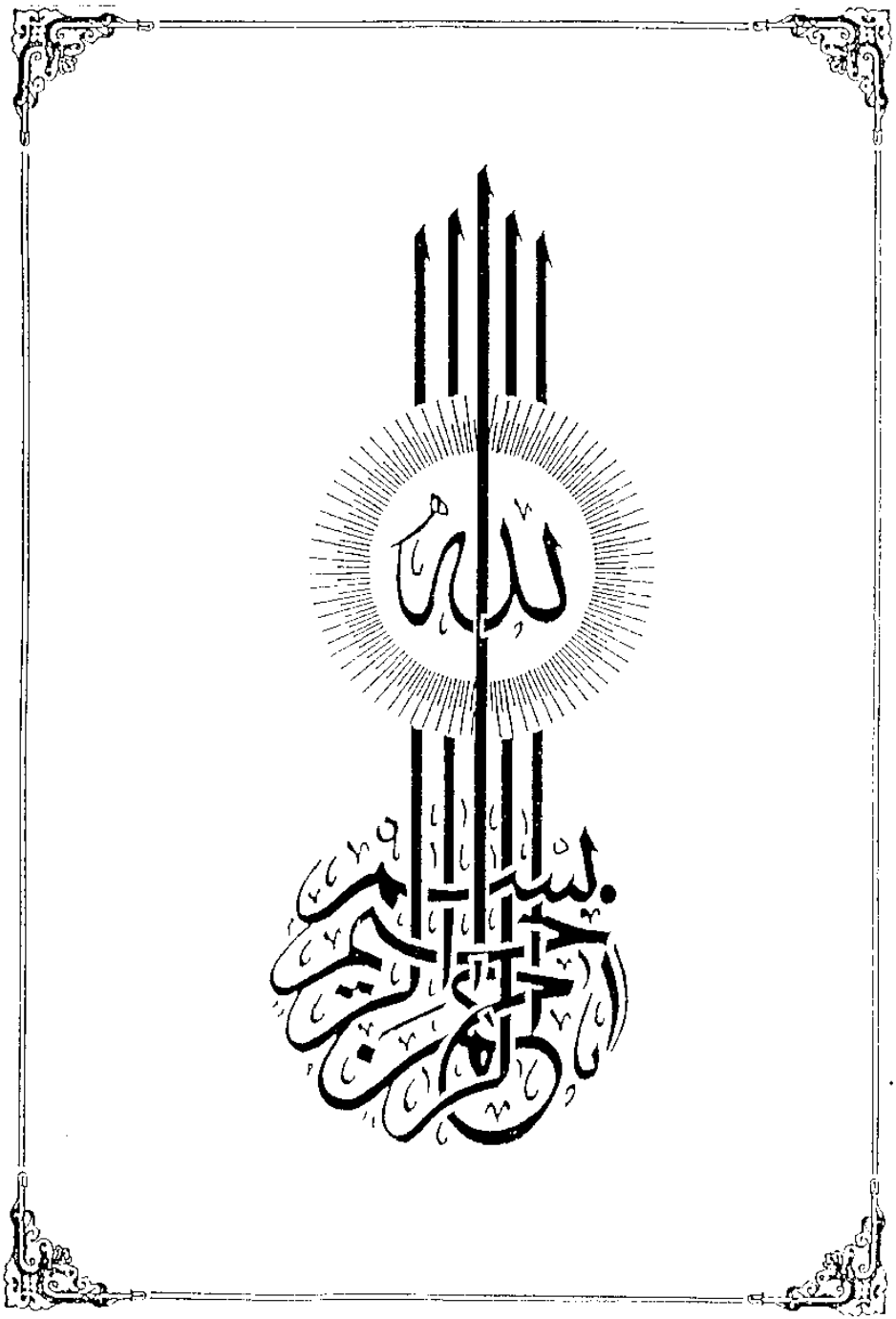




بسم الله الرحمن الرحيم

(ويسئلونك عن الروح قل الروح من امر ربى وما اوتيتم من العلم الا قليلا)

صدق الله العظيم
سورة الإسراء - " آية ٨٥"



To the memory of my father

ACKNOWLEDGMENT

I wish to express my deep gratitude, thankfullness and deepest appreciation to my ***Professor Dr. Hussein Abdel Alim Boshnak,*** professor of General Surgery - faculty of medicine - Ain Shams university under whose guidance and constant supervision, this work has been prepared.

Also, I wish to acknowledge my appreciation and gratitude to ***Dr. Dr. Fateen Abdel Moneim Anous*** assistant professor of General Surgery - faculty of medicine - Ain Shams university, for his kind help, careful guidance and advice.

****

CONTENTS

****

Introduction

Parotid gland is the largest salivary gland and its surgical importance comes from, approximately 75% of all salivary neoplasms arise in the parotid gland, of these some 80% are benign and 80% of the benign tumours are pleomorphic adenoma. ***(Seward 1992).***

Parotid tumours occur predominantly in white population; Benign tumours tend to occur in the younger age group in the fifth decade of life while patients with malignant neoplasms tend to be older. ***(Byrne 1988).***

Salivary tumours are thought to originate from two cell types, intercalated and excretory duct reserve cells, myoepithelial cells are present in many salivary tumours but rarely as the principal malignant cell type. ***(Byrne 1988).***

Parotid surgery could be hazardous and carries the risk of injury to the facial nerve (which enters the gland through its posteromedial surface) or one of its branches, operative bleeding because the gland is piercied by two large vessels (external carotid artery, posterior facial vein), salivary fistula, local recurrence of the tumour operated upon, frey's syndrome and bad cosmatic. ***(Byrne 1988).***

Aim of the Work

The aim of this essay is to present an update comprehensive review of parotid - facial nerve relations, the anatomical variations and the commenest display, together with a detailed description of common pathological entities and different surgical approaches in an attempt to clarify its hazards.

Surgical Anatomy

less detached, and lies between the zygomatic arch above and the paratid duct below. This detached portion is named the accessory part of the gland.

(Williams and Warwick, 1980)

The body of the gland fills the space between the ascending ramus of the mandible and the surface presented by the external acoustic meatus and the mastoid process, its contours moulded to the irregularities of the bed in which it lies. The anterior border of the bed is formed by the projection backwards of the ascending ramus with masseter covering its superficial surface and medial pterygoid covering it deeply. The outer surface of the external acoustic meatus, bony and cartilagenous, forms the posterior border of the bed above, continuing below into the mastoid process and for a short distance along the anterior border of sternocleidomastoid. The floor is formed by the styloid process with its attached muscles and the posterior belly of digastric. These structures separate the gland from the internal jugular vein, the internal carotid artery and cranial nerves, IX, X, XI and XII.

(Mc Gregor, 1992)

The gland has several extensions beyond its main borders. It extends forwards both superficial and deep to the mandibular ramus, overlying part of masseter and medial pterygoid. Just below the condylar neck, above the attachment of medal pterygoid to the bone, where the bone and muscle separate, the gland extends into the gap between the two. In the region of the condyle the gland fills the narrow recess between the capsule of the temporomandibular joint and the external acoustic meatus. Below the meatus it extends on to the outer

surface of the mastoid process and over the anterior border of the sternocleidomastoid muscle.

(Mc Gregor, 1992)

There is no natural plane of cleavage between the gland and the skin capable of being exploited surgically. The gland is also firmly fixed to the structures which border it both anteriorly and posteriorly, with particularly firm fibrous attachments to the external acoustic meatus, the mastoid process and the fibrous sheath of sternocleidomastoid. In contrast, its attachments to the structures lying deep to it are generally much looser.

(Mc Gregor, 1992)

One of the fascial attachments is named the stylomandibular ligament. This structure is a thickening of the fascia *(investing layer of cervical fascia)* deep to the gland, and it passes from the styloid process to the posterior border of the ascending ramus of the mandible just above the angle, separating the parotid from the submandibular gland. Together with the mandibular ramus it forms the boundaries of a narrow tunnel, the stylomandibular tunnel, through which a process of the gland projects towards the pharynx. This process of the gland is occationally the site of tumour, resulting in the so-called "deep lobe" tumour, which presents as a swelling in the faucial and lateral pharyngeal area rather than externally.

(Mc Gregor 1992)

Surfaces of the parotid gland:

The parotid gland possesses three surfaces namely, lateral, anterior and posterior. The superficial or lateral surface, which is the external part of the

superficial leaf of the gland, is being triangular in shape and bounded by the posterior border which reaches the external acoustic meatus and the sternocleidomastoid muscle and extends inferiorly to the angle of the mandible and the posterior belly of the digastric muscle. The superior border which lies below the zygomatic arch, generally matching the horizontal plane of the arch. The anterior border which ascends irregularly to meet the superior border. Thus forming the apex of the gland. The apex, directed forward, rests upon the masseter muscle and, when prolonged as an accessory lobe, may follow the duct to the buccinator muscle.

(Anson and Mc Vay, 1984)

The anterior *(or antero - inferior)* surface of the gland is molded around the posterior border of the ramus of the mandible and the muscles which clothe the latter - the masseter laterally, the pterygoideus internus medially. The sulcus thereby produced in the anterior surface of the gland being, in some instances, a deep incisura, may continue posterioly as the cleavage plane between the superficial and deep leaves.

(Anson and Mc Vay, 1984)

The posterior *(or posteromedial)* surface is in contact with the sternocleidomastoid muscle, the mastoid process of the temporal bone, the cartilage of the external acoustic meatus, the posterior belly of the digastric muscle, the internal carotid artery, the internal jugular vein, the root of the styloid process, and the muscles *(stylohyoideus, styloglossus)* attached thereto.

(Anson and Mc Vay, 1984)

As the anterior and posterior surfaces of the gland meet,. The part of the gland thus formed may extend medialward beyond the styloid process, toward the pharynx; this medial part, the processus retromandibularis, may constitute the bulk of the deep leaf.

(Anson and Mc Vay, 1984)

Parotid Duct:

The human parotid duct, known also as stensen's duct, is 6 to 8 cm long in the adult. It begins at the anterior part of the parotid gland, crosses the masseter muscle, and at the muscle's anterior border turns medially, nearly at aright angle, and passes through the fibroadipose tissue of the check and pierces the buccinator muscle. The duct runs obliquely forward for a short distance (1cm) between the buccinator muscle and the mucosa of the oral cavity and opens into the oral surface of the check by a small orifice opposite the second upper molar tooth.

(Kevin and Batsakis, 1991)

Structures within the parotid gland:

The structures of surgical significance which pass through the gland are the external carotid artery, the retromandibular vein with their branches and the facial nerve.

(Mc Gregor, 1992)

The external carotid artery:-

It enters the posteromedial surface, dividing into the maxillary artery which emerges from the anteromedial surface and the superficial temporal artery which

gives off its transverse facial branch in the gland and ascends to leave its upper limit. The posterior auricular artery may also branch from the external carotid artery within the gland leaving by its posteromedial surface.

(Williams et al., 1989)

The retromandibular vein:-

The retromandibular vein formed by the union of the maxillary and superficial temporal veins *(which enter near the points of exit of the corresponding arteries)*, is superficial to the external carotid artery and emerges behind the gland's apex to join the posterior auricular vein, forming the external jugular. It has a communicating branch which leaves anterior to the apex to join the facial vein.

(Williams et al., 1989)

The facial nerve:

The facial nerve emerges from the stylomastoid foramen at apoint 2.5 - 4cm deep to the middle of the anterior border of the mastoid process. Almost at once it enters the parotid gland. Before doing so it gives off three branches.

A) posterior auricular: This nerve associates itself with the artery of that name, and runs back in the groove behind the pinna to supply the occipitalis muscle and the auricularis posterior.

B) Nerve to stylohyoid: A long thin twig.

C) Nerve to digastric (posterior belly): a short fat twig, which gives a communication to the glossopharyngeal nerve, which communication soon leaves this latter, as the nerve to the stylopharyngeus.

In the parotid the facial nerve lies superficial to the posterior facial vein and external carotid artery. It soon divides into two divisions.

a) The temporofacial which runs sharply upward.

b) The cervicofacial which continues the course of the parent trunk downwards forwards and outwards.

(Pitts, 1986)

These divisions in turn divide to form the goose's foot *(pes anserinus)*, the branches of which leave the anterior border of the parotid and pass as five twigs to the i- temporal ii- zygomatic iii- buccal iv- mandibular, and v- cervical (regions.), to supply the muscles of expression, which inculde the buccinator, the frontalis, and the platysma. All these nerves communicate on the face with branches of the v^{th} cranial.

(Pitts, 1986)

Variations in the pattern of branching are common as in a recent series of 350 cervicofacial dissections, the trunk of the nerve separated into two main divisions, the temporofacial and cervicofacial portions, this point of bifucation of the facial nerve lies posteriorly and slightly medial to the ramus of the mandible and superiorly two-thirds of the distance between the external angle of the mandible and the temporomandibular articulation in all instances the temporofacial portion of the nerve is the larger of the two primary divisions in the proximal part of its course, this division lies between the lobes of the parotid gland, proximal to the point of its separation into branches. The cervicofacial division is usually about half the size of the upper division; its branches and anastomosis are far less complex than those of the temporofacial part.

(Anson and Mc Vay, 1984)

Despite of these variations, these do not present a serious hazard to the surgeon, since at operation the branches are traced through the gland under visual control in these clinical situations where maintainance of the continuity of the nerve is of prime importance. The pattern is also frequently altered when a tumour is present in the gland.

(Mc Gregor, 1992)

The mandibular branch of the facial:-

This has important relations., It passes down, continuing the course of the main trunk, just behind the angle of the mandible., it then lies deep to the platysma between it and the deep cervical fascia, crossing the inferolateral surface of the submandibular gland. It turns up and crosses the lower border of the mandible to supply the quadratus labii inferioris muscle. Incisions made behind the angle of the jaw, e.g. mastoid process to hyoid bone, will cut this branch of the facial unless the cut is made at least 2.5cm behind the angle. The result of division of the nerve is paralysis of the muscle, so that the mouth will be asymmetrical.

(Pitts, 1986)

Facial nerve in relation to the parotid gland:-

The gland is divided by the nerve into suprafacial and subfacial parts and parotid tumours should be removed by an anatomical dissection of the gland leaving the nerve intact. The nerve is followed forwards or its terminal branches are traced back. The former procedure entails exposing the trunk of the facial nerve at its emergence from the stylomastoid foramen; there is about 1cm of nerve trunk before it enters the parotid and another centimeter before it divides