

MANAGEMENT OF PAROTID GLAND NEOPLASIA

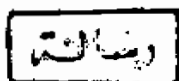
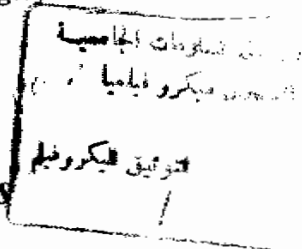
An Essay

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of the master degree in General Surgery*

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Chapter I

INTRODUCTION

INTRODUCTION

Tumours of the parotid gland are indeed rare and account for less than 2.4% of all neoplasms in the head and neck region. 80% of parotid tumours are found to be benign (Bjorklund and Eneroth, 1980).

Historically, the salivary gland neoplasms were vaguely classified until Foote and Frazell presented their correlation of histopathologic and biologic behaviour in 1953. The early ambiguity in histologic classification and biologic characteristics for salivary gland tumours meant that therapy was poorly directed prior to the 1950s (Coulthard, 1987).

The management of parotid gland tumours is complicated by its intricate interaction with the complex anatomy of the head and neck. A further challenge lies in the numerous histopathologic possibilities associated with the parotid mass and the limited amount of pretreatment information available at the time of surgery (Johns and Kaplan, 1987).

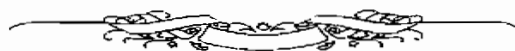
Furthermore, parotid gland cancers have a variable biologic course and do not follow the familiar survival pattern of head and neck cancers. Three and five year follow up periods are inadequate for reviewing survival rates among patients with parotid cancer. In fact many of these lesions are so slow in their growth that a 20-year survival with active disease is possible (Johns and Kaplan, 1987).

The fundamental goal in the management of parotid gland neoplasms is no different than the management of neoplasms anywhere else in the body : Eliminate all the tumour with a minimum deformity and reconstruct any residual defect when reasonable (Johns and Kaplan, 1987).

Chapter II



ANATOMY



REVIEW OF LITERATURE

ANATOMY

The parotid gland is the largest of the three major paired salivary glands and has an average weight of about 25 gm. It forms an irregular, lobulated, yellowish mass lying below the external acoustic meatus between the mandible and the sternocleidomastoid, it projects forwards on to the surface of the masseter where a small part of it, usually more or less detached, lies between the zygomatic arch above and the parotid duct below, this detached part is named the accessory parotid gland (Williams et al, 1993).

Development of the parotid gland :

All the major salivary glands are ectodermally derived, and they arise in fundamentally the same manner by the growth of oral epithelium into the underlying mesenchyme (Eversole, 1971).

The parotid gland is an outgrowth from the buccal cavity and extends backwards towards the ear. It can be recognized in human embryo 8 mm long as an elongated furrow running dorsally from the angle of the mouth between the mandibular arch and the maxillary process. The

groove which is converted into a tube, loses its connection with the epithelium of the mouth, except at its ventral end, and grows dorsally into the substance of the cheek. The tube persists as the parotid duct and its blind end proliferates to form the gland. Subsequently the size of the oral fissure is reduced by partial fusion between the maxillary and mandibular processes and the duct opens thereafter on the inside of the cheek at some distance from the angle of the mouth (Williams et al, 1993).

As the gland grows backwards, it covers the facial nerve, but from its deep surface prolongations of the gland penetrate between the branches of the nerve in an irregular manner and constitute its deep portion. These outgrowths wrap themselves round the nerve and its branches which become buried in its substance. On account of this arrangement the gland may be considered to comprise superficial and deep sections, sometimes termed lobes (williams et al, 1993).

The musculoskeletal bed of the parotid gland :

The parotid gland lies in and superficially overlap the borders of a musculoskeletal recess formed by portions of the temporal bone, atlas and the mandible and their related muscles. The bony fossa is limited posteriorly by the anterior surface of the mastoid process. Its superior margin is formed posterosuperiorly by the convex surface of the external acoustic meatus and anterosuperiorly by the head of the mandible articulating in the mandibular fossa. Ramus of the mandible is an anterior

limit. Marking the medial wall of the bony recess superiorly is the styloid process and lower down, the surprisingly prominent tip of the transverse process of the atlas. The mastoid process forms the posterior limit (Johns, 1977).

The muscles having origin from or insertion in the framework outlined above complete the musculoskeletal bed of the parotid gland. the mastoid process is hidden from view by the insertion of the sternocleidomastoid muscle. The medial wall of the fossa is covered by the posterior belly of the digastric muscle and those muscles originating from the styloid process. its anterior border overlaps the tip of the transverse process of the atlas.

The styloglossus, stylohyoid and stylopharyngeus muscles pass anterior to the transverse process of the atlas and fan out to their insertions from above downwards as named. Anteriorly, three muscles insert in the ramus of the mandible, the masseter laterally and the two pterygoid muscles medially (Johns, 1977).

The gland is enclosed within a capsule derived from the deep cervical fascia; the fascia coli. At the lower pole of the gland, the general investing layer of this fascia splits to enclose it. The deeper of the two layers passes up under the gland to be attached to the base of the skull. The more superficial layer passes up lateral to the masseter muscle to be attached to the zygomatic arch, it is this layer which is called the

parotidomasseteric fascia. It is of great strength and density which accounts for the severe pain produced by the inflammatory swellings of the gland and it is closely adherent to it (Du Plessis, 1986). The portion of the fascia attached to the styloid process and the angle of the mandible is thickened to form the stylomandibular ligament which intervenes between the parotid gland and the submandibular gland, and it is pierced by the cervical part of the facial artery (Du Plessis, 1986).

Davis and co-workers described the fascial investment of the gland as superficial and deep layers of connective tissue that fuse peripherally to enclose it. they further described the continuity of this fascia with numerous septa passing inbetween the lobules of the gland, as well as, the connective tissue surrounding the intraglandular portion of the facial nerve. All surgical procedures in the parotid region are facilitated by the existence of these fascial elements. The presence of these fascial prolongations within and between the parotid lobules makes possible techniques of blunt dissection by which, damage to the facial nerve is best avoided (Davis et al, 1956).

Morphology :

The parotid gland is like an inverted, flattened three sided pyramid, it presents a small superior surface and superficial, anteromedial and posteromedial surfaces (Fig. 1). The lower part of the gland tapers to a blunt apex (Williams et al, 1993).

The superior surface is concave and is related to the cartilaginous part of the external acoustic meatus, and to the posterior surface of the temporomandibular joint, here the auriculotemporal nerve winds round the neck of the mandible, embedded in the gland or in the capsule around it.

The apex of the gland overlaps the posterior belly of the digastric and the carotid triangle to a variable extent.

The superficial surface is covered with the skin and the superficial fascia, which contains the facial branches of the great auricular nerve, the superficial parotid lymph nodes and the posterior border of the platysma. It extends upwards to the zygomatic arch, backwards to overlap slightly the anterior border of the sternocleidomastoid, downwards to its apex behind and below the angle of the mandible, and forwards across the superficial surface of the masseter below the parotid duct.

The anteromedial surface is grooved by the posterior border of the ramus of the mandible. It covers the postero-inferior part of the masseter, the lateral aspect of the temporomandibular joint and the adjoining part of the mandibular ramus (Fig. 2).

The branches of the facial nerve emerge on the face from the undercover of the anterior margin of this surface.

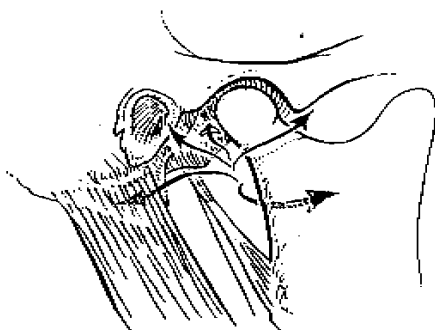


Fig. (3) : Processes of the parotid gland

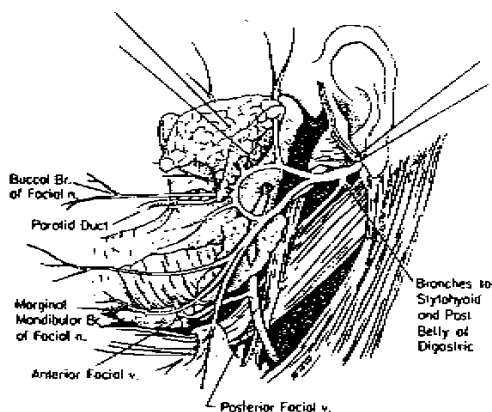


Fig.(4) : Parotid gland and its relationship to the facial nerve and surrounding anatomic structures. Note the relationships of the facial nerve and branches to the tragal pointer, parotid cut and posterior facial vein.

The parotid (Stensen's) duct :

It is about 5 cm long, it begins by the confluence of two main branches within the anterior part of the gland, crosses the masseter, and at the anterior border of this muscle, it turns inwards nearly at a right angle, passes through the corpus adiposum of the cheek and pierces the buccinator, it then runs for a short distance obliquely forwards between the buccinator and mucous membrane of the mouth and opens upon a small papilla on the oral surface of the cheek opposite the crown of the second upper molar tooth. While crossing the masseter it receives the duct of the accessory lobe, in this position it lies between the upper and lower buccal branches of the facial nerve, the accessory part of the gland and the transverse facial artery are above it. The buccal branch of the mandibular nerve, as it emerges from beneath the temporalis and masseter, lies just below the duct at the anterior border of the masseter (Williams et al, 1993).

Surface anatomy :

The parotid duct can be felt in the living, on the face or more easily in the vestibule of the mouth, as it dips inwards at the anterior border of the masseter, by pressing the index finger backwards on this border of the muscle (with the teeth clenched to make the muscle tense) and moving the finger up and down across the line of the duct.