PATHOLOGICAL STUDY OF SALIVARY GLAND TUMOURS AND SIMILAR TUMOURS OF SWEAT AND LACRIMAL GLANDS

THESIS

Submitted for Partial Fulfilment of
Master Degree in Pathology

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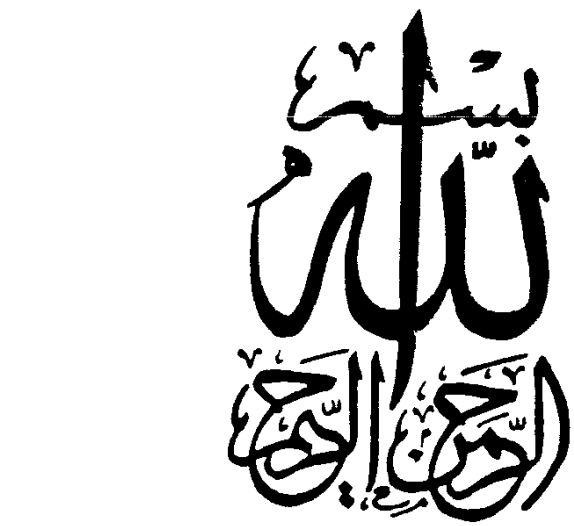
1987



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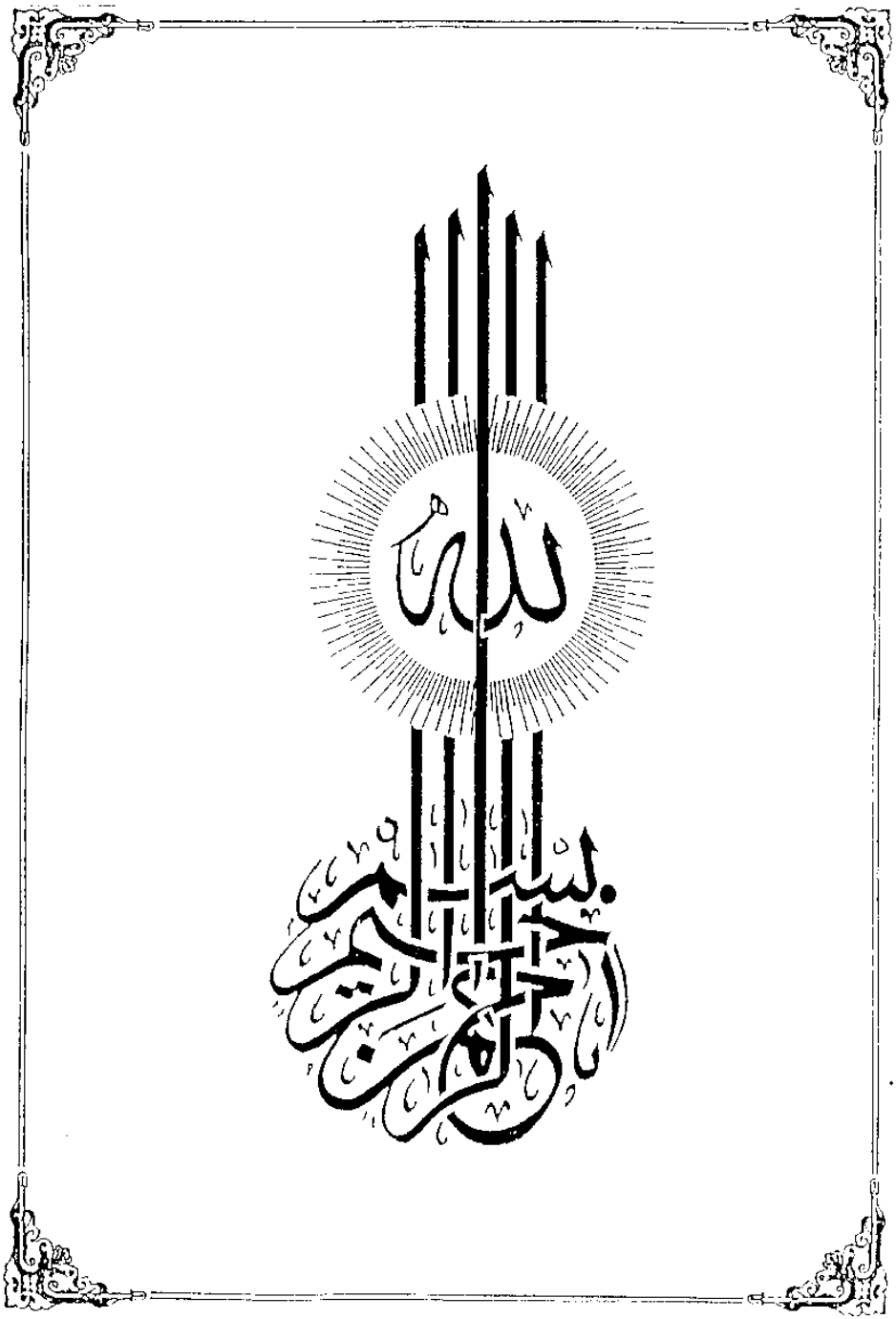

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ACKNOWLEDGEMENT

I wish to express my sincere thanks and deep appreciation to ***Prof. Dr. Adly Farid,*** *Professor and Head of the Pathology Department - Ain Shams Faculty of Medicine for his valuable suggestion and continuous co-operation throughout this work.*

My deep heartful feelings of appreciation and sincere thanks to ***Dr. Nadia B. Mahmoud,*** *Ass. Prof. of Pathology-Ain Shams Faculty of Medicine for her keen supervision, wise guidance, generous advice and valuable suggestions of this work.*

I wish also to thank ***Dr. Mousa Abdel Aziz Shahin,*** *Lecturer of Pathology - Ain Shams Faculty of Medicine for his guidance, support and supervision of this work.*

INTRODUCTION AND AIM OF THE WORK

INTRODUCTION

Salivary gland tumours are among the most interesting lesions of the head and neck. Their multiple structural characteristics and the frequent difficulties in correlating histologic features with clinical behaviour require an accurate histopathologic study for their appropriate management **(Fitzpatrick and Black, 1985).**

The lacrimal glands may be the focus of tumours with the same property as the major and minor salivary gland tumours **(Delire et al., 1975).**

Furthermore, recognition of an analogy between tumours of salivary glands and those of sweat glands is not new. In these tumours, there are histologic features which recall stages in the embryonic development of salivary glands and/or adnexae of skin **(Batsakis and Brannon, 1981).**

AIM OF THE WORK:

To study the incidence, classification, histopathology and ultrastructure of tumours of salivary glands and similar tumours of sweat and lacrimal glands trying to find the relationship in histogenesis among them.

REVIEW OF LITERATURE

EMBRYOLOGY OF THE SALIVARY GLANDS

The major salivary glands and many of the minor salivary glands are derived from stomodeal ectoderm, although those minor glands of the nasopharynx and base of the tongue that arise from pharyngeal endoderm show no histologic differences in the adult that would indicate a difference in origin **(Patton, 1968).**

George et al. (1980) reported that each of the major salivary glands develops in a generally similar fashion by the ingrowth of oral epithelium into the underlying mesenchyme. The bud of epithelial cells proliferates to form a cylindric mass, which extends away from the oral cavity toward its eventual destination. As this cord of cells elongates, budding and branching of the distal segments occur, resulting in the formation of primordial ducts and acini. As the outer ductal cells differentiate into a secretory epithelium, the ductal lumen is formed by degeneration of the central cells. Serous and mucous acini develop from the terminal buds. The myoepithelial cells probably arise here as well. While epithelial growth and differentiation is taking place, the connective tissue stroma of the glands forms by condensation of the regional mesenchyme.

Patton (1968), reported that the parotid gland primordium can be recognised in the six-weeks embryo at a point in the cheek where the duct orifice is eventually located. It grows upward and backward across the lateral aspect of the masseter muscle, ending its course against the developing ear canal structures. Simultaneously,

the facial nerve migrates anteriorly through the developing gland and becomes surrounded by it. The growing glandular parenchyma insinuate itself into the many spaces related to the mandible, temporal bone and adjacent muscles, forming the many irregularly shaped processes that characterize the adult parotid gland.

Arising near the midline in the floor of the oral cavity,the submandibular primordium is seen late in the sixth week of fetal life. The point of origin is marked in the adult by the orifice of the submandibular duct. The duct elongates posteriorly nearly to the angle of the mandible.

The sublinguals are the last of the major salivary glands to appear. They can be seen by the end of the seventh week and develop, not as a single anlage, but rather as several closely related groups of cell buds. Although these groups merge into a single gross structure that is surrounded by a common fascial envelope, the multicentricity of origin is evidenced in the adult by the presence of multiple ducts that open directly into the floor of the mouth and into the submandibular duct.

Thompson and Bryant (1950), found that the epithelial growth and differentiation of the parotid gland primordium occurs in an already present meshwork of undifferentiated lymphoid stroma. At 20 mm crown-rump length, round cell clusters begin to form. Later, (at the 60 mm length) these cells are recognized as lymphocytes. These lymphoid elements are conspicuously absent in the sublingual and submandibular glands. Whereas, the parotid gland develops as a meshwork of branching ducts within a lymphoid stroma, the submandibular and sublingual glands develop as uninvaded units within

a well-defined mesenchymal capsule seen as early as $7\frac{1}{2}$ weeks. At the parotid site, no evidence of similar encapsulation is seen prior to 14 weeks. As a result of this late encapsulation, small lymph nodes, some containing salivary tissue, occasionally are enclosed within the parotid gland. Salivary ducts and acini have been also found in lymph nodes outside the capsule of the parotid.

EMBRYOLOGY OF THE LACRIMAL GLAND

The lacrimal gland develops from the ectoderm forming the conjunctival surface of the eye ball. Once formed, it receives connective tissue septa and supporting structures from the mesoderm **(Newell, 1982). Wolff (1976)**, stated that the lacrimal gland develops by about eight wedge-shaped epithelial buds which grow towards the end of the second month from the upper and temporal side of the conjunctival sac and repeatedly divide. With the development of the levator and fascia bulbi, the gland is divided into orbital and palpebral portions. The full histological differentiation does not, however, take place till after birth, so that tears are not produced till about the beginning of the third month.

The conjunctival (Krause's) glands are developed as growths of the basal cells of the upper conjunctival fornix and to a slight extent from the lower fornix at about six months **(Mausolf, 1975).**

EMBRYOLOGY OF THE SWEAT GLANDS

Eccrine Sweat Glands:

Lever and Schaumburg (1983), stated that the embryonal stratum germinativum differentiates into basal cells giving rise to the (keratinizing) epidermis and primary epithelial germs (hair germ) and into eccrine gland germs giving rise to the eccrine glands.

Eccrine glands develop in man earlier on the palms and soles than elsewhere. On the palms and soles, eccrine gland germs are first seen in 2-to 13 weeks old embryos **(Hashimoto et al., 1965).**

The eccrine gland germs begin as areas of crowding of deeply basophilic cells in the basal layer of the epidermis. They differ from primary epithelial germs by being narrow and by showing fewer mesenchymal cells at their base. At an age of 16 weeks, both intraepidermal and intradermal lumens begin to form on the palms and soles.

At the time of lumen formation, the intradermal duct as well as secretory segment show a wall composed of two layers of cells, an inner layer of luminal cells and an outer layer of basal cells. Dermal duct continues to consist of these two layers of cells throughout life.

In the secretory segment, the two layers undergo differentiation. The luminal cells differentiate into tall, columnar secretory cells. The basal cells differentiate either into secretory cells or into myoepithelial cells. The differentiation into secretory and myoepithelial

cells in the secretory segment is well advanced on the palms and soles in embryos 22 weeks old.

At time of birth, the appearance of eccrine glands resembles that of adult eccrine glands **(Hashimoto et al., 1966 c).**

Electron Microscopy:

On electron microscopic examination, the lumen formation in the eccrine dermal duct results from separation of desmosomes between opposing luminal cells and subsequent formation of microvilli at the luminal surfaces. In the secretory portion, the lumen formation begins by separation of luminal cells followed by appearance of microvilli, Golgi elements, mitochondria, small secretory vesicles, dense secretory granules and abundant endoplasmic reticulum in the secretory cells. The appearance of these structures suggests that preparation for the secretory function of the eccrine secretory segment begins in early embryonic life **(Hashimoto et al., 1966 c).** In the intraepidermal portion of the eccrine duct, intracytoplasmic vacuoles form through lysosomal action within the inner cells. These vacuoles enlarge, fuse and break through plasma membrane. Through coalescence with similar vacuoles produced from adjoining inner cells, a potent extracellular lumen is formed. After formation of the lumen, the intra epidermal eccrine duct unit undergoes keratinization **(Hashimoto et al., 1965).**

Apocrine Sweat Glands:

Apocrine sweat gland is a derivative of the primary epithelial germ as are the sebaceous gland and hair follicle **(Maximow and Bloom, 1943).**

At an early stage of development, about the fourth to fifth intrauterine month, all hair follicles over most of the skin surface have potential to develop apocrine sweat glands. At this time, a small nipple-like down-growth appears at the upper end of the hair follicles which consists of a solid cord of epithelial cells **(Pinkus, 1958).**

It continues to extend and develop into apocrine gland in only a small percentage of hairs, however, primarily in those of the axilla, anogenital region, mammary areola and ear canal, but also irregularly on parts of the trunk, scalp and face. In the rest of the skin, the apocrine bud gradually diminishes in size and lost as a part of hair follicle or adjacent epidermis **(Hurley and Shelley, 1960).** The point at which the down-growth appears is about at the junction of the hair follicle and epidermis **(Pinkus, 1958).**

Apocrine bud migrates or pulls away from the follicle to develop independently, extension of the apocrine down-growth is continued with coiling and cleft formation in the center of the coiled cords. A lumen is formed and subsequent differentiation into glandular and ductal portionsoccurs **(Hashimoto, 1970).**

At birth and for several years, the apocrine glands while distinguishable histologically are non functioning in all apocrine areas except the ear canal, where the ceruminous glands are fully functioning at birth and are apparently under a different endocrinal control **(Hurley and Shelley, 1960).**