ORONASAL FISTULAE

ESSAY

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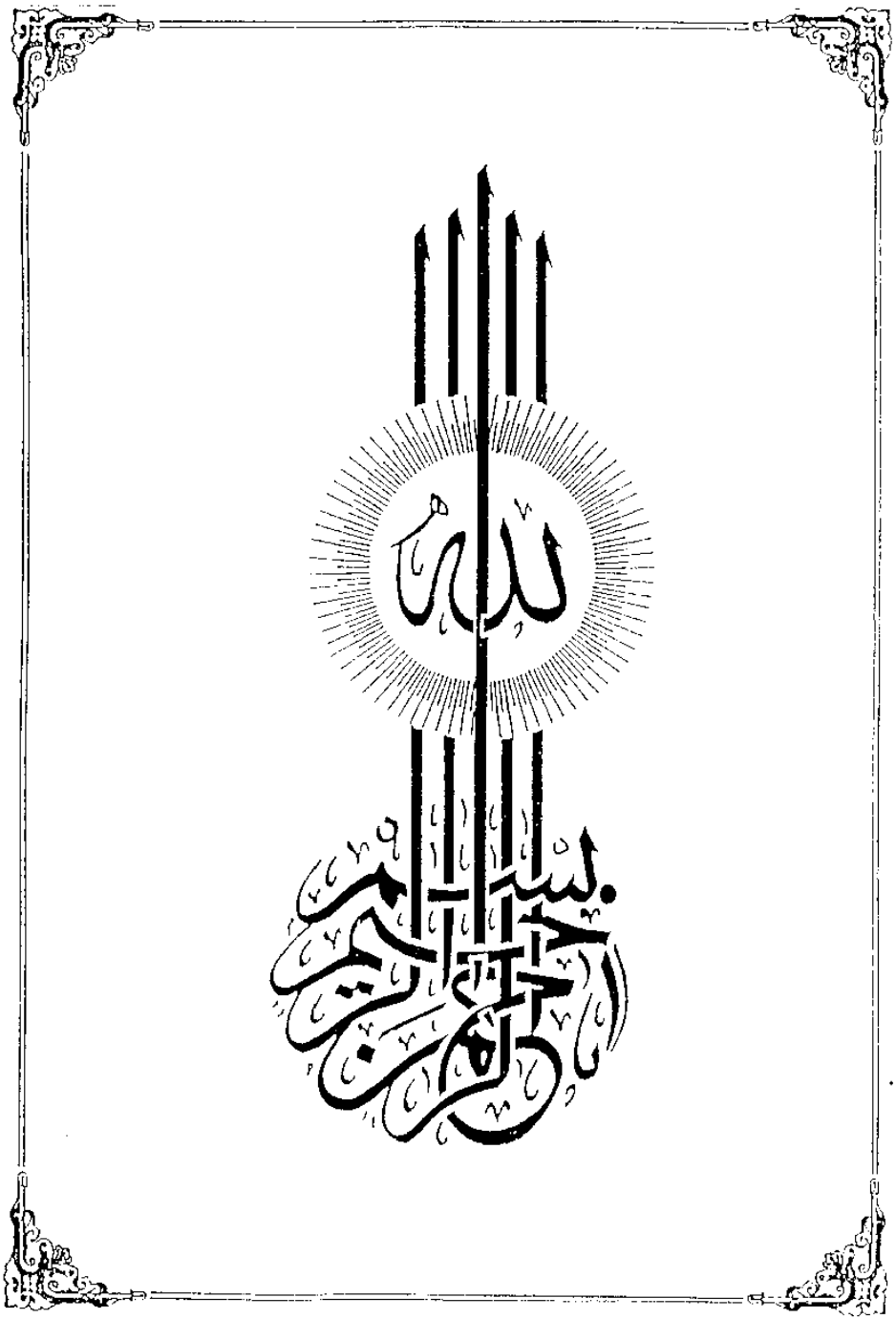
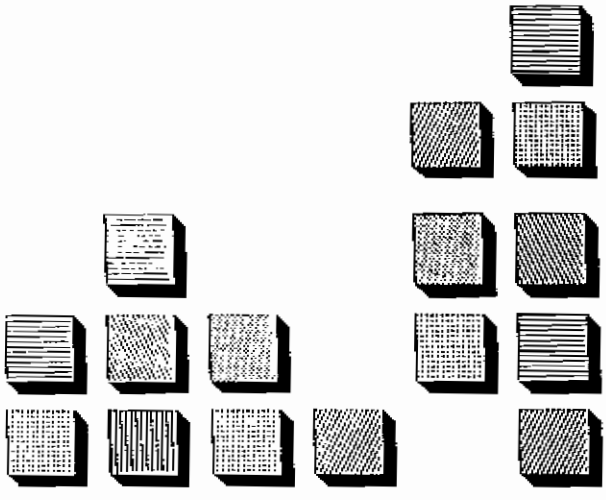


CONTENTS

Page

INTRODUCTION



INTRODUCTION

The oronasal fistula is a pathologic defect lined by stratified squamous and -or- pseudostratified columnar ciliated epithelium that connects the oral and nasal cavities.

The most frequent causes of oronasal fistulae are congenital, traumatic injuries, infections and neoplasms. Occasionally, an acute dentoalveolar abscess of the maxillary central incisor region may tunnel through the maxilla into the floor of the nasal cavity forming an oronasal fistula.

The most common predisposing traumatic injuries are motor vehicle accidents and gun shot wounds **(Thompson et al., 1985)**.

Oronasal fistula is a common complication of cleft palate repair. In **1931 Veau** reported an incidence of 10%, and others have found frequencies to be as high as 21%.

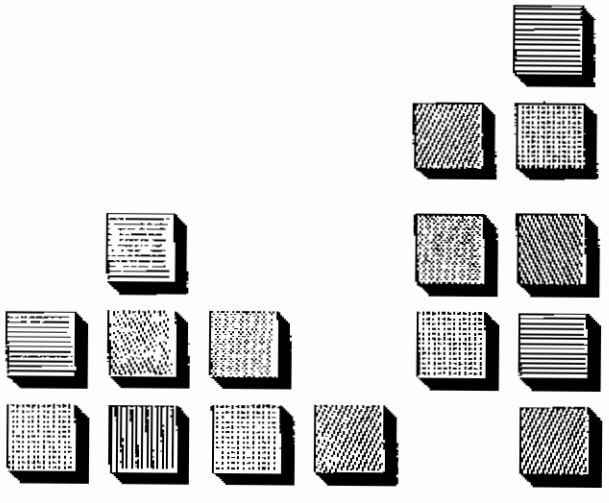
Fistulae may occur in the labial vestibule, the alveolus, the hard palate and at the junction between the hard and soft palates.

Complications of these fistulae include nasality in speech, leakage of fluids into the nose, and food lodging in the defect. The complications depend to some extent on the site and size of the fistula **(Amaratunga, 1988)**.

The relatively high incidence of oronasal fistulae after cleft palate repair and difficulty of their repair led us to discuss the different techniques, advantages and disadvantages of each.

The aim of this work is to study the etiology of oronasal fistulae and to define the various techniques used for their closure. Trying to find the best ways to repair such fistula.

EMBRYOLOGY OF THE PALATE



CHAPTER I
Embryology Of The Palate

Williams and Warwick (1980) stated that after the head fold has formed, the stomatodeum or the primitive mouth, is bounded cranially by the projection of the forebrain and caudally by the cardiac prominence. The mandibular region and the whole of the neck, which will subsequently intervene between the mouth and the developing thorax, are as yet absent; but will be formed by the appearance and modification of six paired branchial arches, which develop on the lateral aspects of the head.

The branchial arches play a large part in the formation of the face, oral cavity, neck, pharynx and larynx.

Decker and du Plessis (1986) stated that the face is formed from five processes which surround an opening (the stomatodeum) at the anterior end of the embryo. These are frontonasal process (single), maxillary processes (one on each side) and mandibular processes (one on each side) (Figs.1-5).

The nasal pits, each surrounded by a lateral and medial nasal process, develop in the frontonasal process. The two medial nasal processes merge to form the intermaxillary segment which consists of the philtrum of the upper lip, an upper jaw component which carries the four incisor teeth, the triangular primary palate (premaxilla) and the nasal septum which develops as a down growth from the fused medial nasal processes.

The lateral nasal process forms the side of the nose. It takes no part in the formation of the upper lip.

The maxillary processes fuse with the lateral nasal process at the nasolacrimal groove (the future nasolacrimal duct) and with the medial nasal processes to form the lateral part of the upper lip.

Two lateral palatine processes, which fuse in the midline to form the secondary palate, develop from the inner aspect of the maxillary processes. The palate is formed by the fusion of secondary palate to the primary palate. The incisive foramen marks the junction of the two components of the palate (Figs.6-8).

The mandibular processes give rise to the lower lip and lower jaw.

Williams and Warwick, (1980) stated that during the sixth week the internal aspects of the maxillary processes produce palatine processes, which grow towards the midline but are for sometime separated from each other by the tongue. At this stage the roof of the oral cavity projects anteriorly beyond its floor, and the tip of the developing tongue actually lies in contact with the cranial (superior) surface of the primitive palate.

Johnston et al. (1990) stated that the growth of the palatal shelves (processes) is apparently regulated by an epithelial-mesenchymal interaction at the shelf edges, perhaps like that taking place at the end of the limb bud where the apical ectodermal ridge epithelium interacts with the underlying mesenchyme (the so-called "progress zone").

When the palatal shelves first start to develop, they are directed downward so the their margins lie along the floor of the mouth on either side of the root of the tongue. Palatal elevation occurs during the eighth week. The development of the neck allows some descent of the tongue. The tongue is attached to the anterior end of the mandible and rapid mandibular growth may assist in bringing the tongue down and forward from between the shelves. In addition, mouth opening movements and possibly even tongue movements appear to be involved in removal of the tongue

from between the shelves **(Patten, 1971)**, **(Williams and Warwick, 1980)** and **(Johnston et al., 1990)**.

When the shelves have reached a size sufficient for contact after elevation, they begin the process of reorientation. In the hard palate region they appear to hinge upward, while in the posterior region they apparently undergo a remodeling process **(Johnston et al., 1990)**.

The shelf edge epithelium undergoes a sequence of developmental alterations that begin even before contact is made. Unlike the other covering epithelia that differentiate into mucous secreting (nasal surface) and keratinizing (oral surface) epithelia, the shelf edge epithelia cease proliferation and undergo partial breakdown and other changes. The covering peridermal cells slough. The underlying cells become active in the contact and adhesion through extended cell processes and the production of adhesive glycoproteins. Desmosomes form rapidly between the contacting epithelial cells to complete the adhesion **(Johnston et al., 1990)**.

As the palatal shelves grow medially along the inferior borders of the primitive choanae, they unite with them except over a small area in the midline where a nasopalatine canal maintains connection between the nasal and oral cavities for sometime and

marks the position of the incisive fossa. As the medial borders of the maxillary palatine processes (shelves) fuse together, fusing also with the cranial free border of the nasal septum, the nasal and oral cavities are progressively separated. The nasal cavities are thus extended dorsally, and the choanae reach their final position, leaving the caudal edge of the nasal septum free in about its dorsal quarter as the partition between them. The posterior extremities of the palatine processes, which extend dorsally beyond the choanae, fuse together to form the soft palate **(Williams and Warwick, 1980)**.

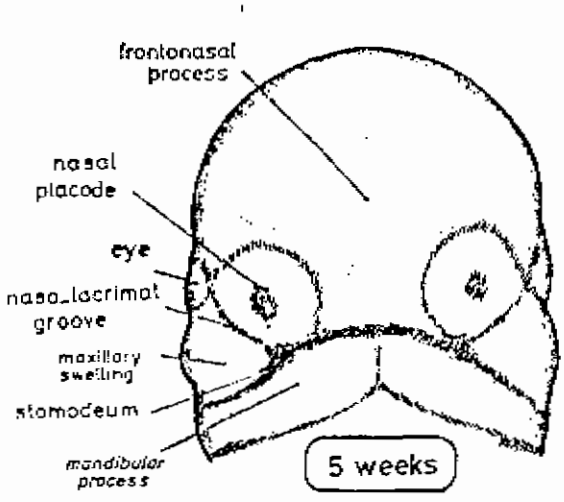


Fig.1: Frontal view of the region of the face of a 5-week embryo.

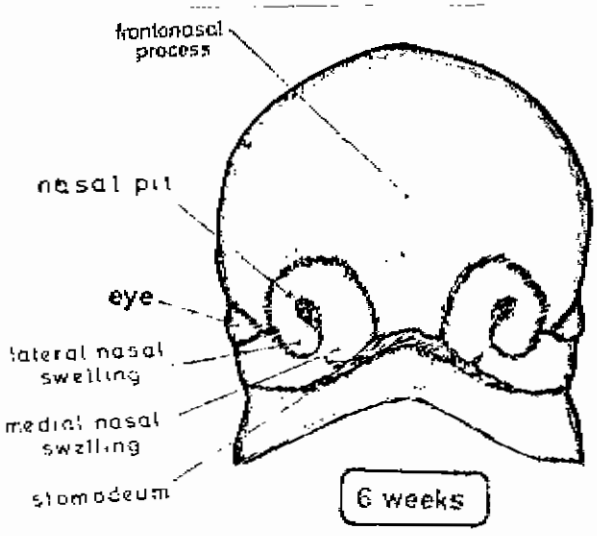


Fig.2: Frontal view of the region of the face of a 6-week embryo.

(Notice that deep grooves gradually separate the nasal swellings from the maxillary swellings).

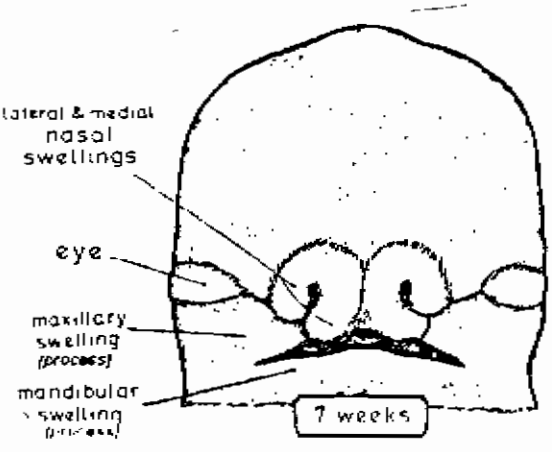


Fig.3: Frontal view of the region of the face of a 7-week embryo.

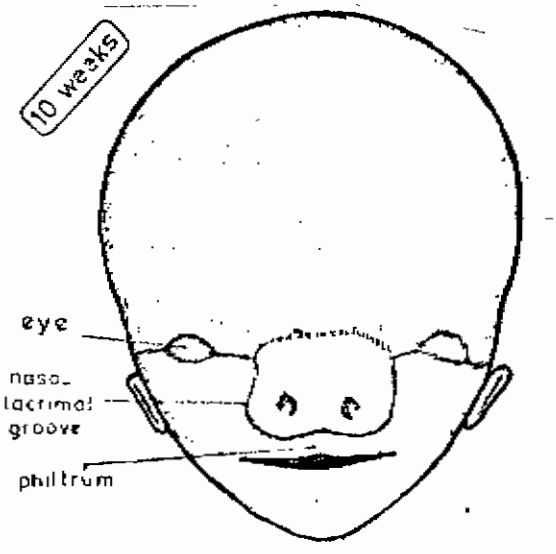


Fig.4: Frontal view of the region of the face of a 10-week embryo.

(Notice that the maxillary swellings gradually merge with the nasal folds)

(After El-Rakhawy, 1975).