EVALUATION OF MAXILLARY ORTHOGNATHIC SURGICAL PROCEDURES BASED ON A STUDY OF IT S'BLOOD SUPPLY

THESIS

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Doctoral Degree in Plastic and Reconstructive Surgery

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1994

TO

MY FAMILY

&

MY UNCLE
THE LATE MAJOR GENERAL ADEL SOUKA

WITH LOVE

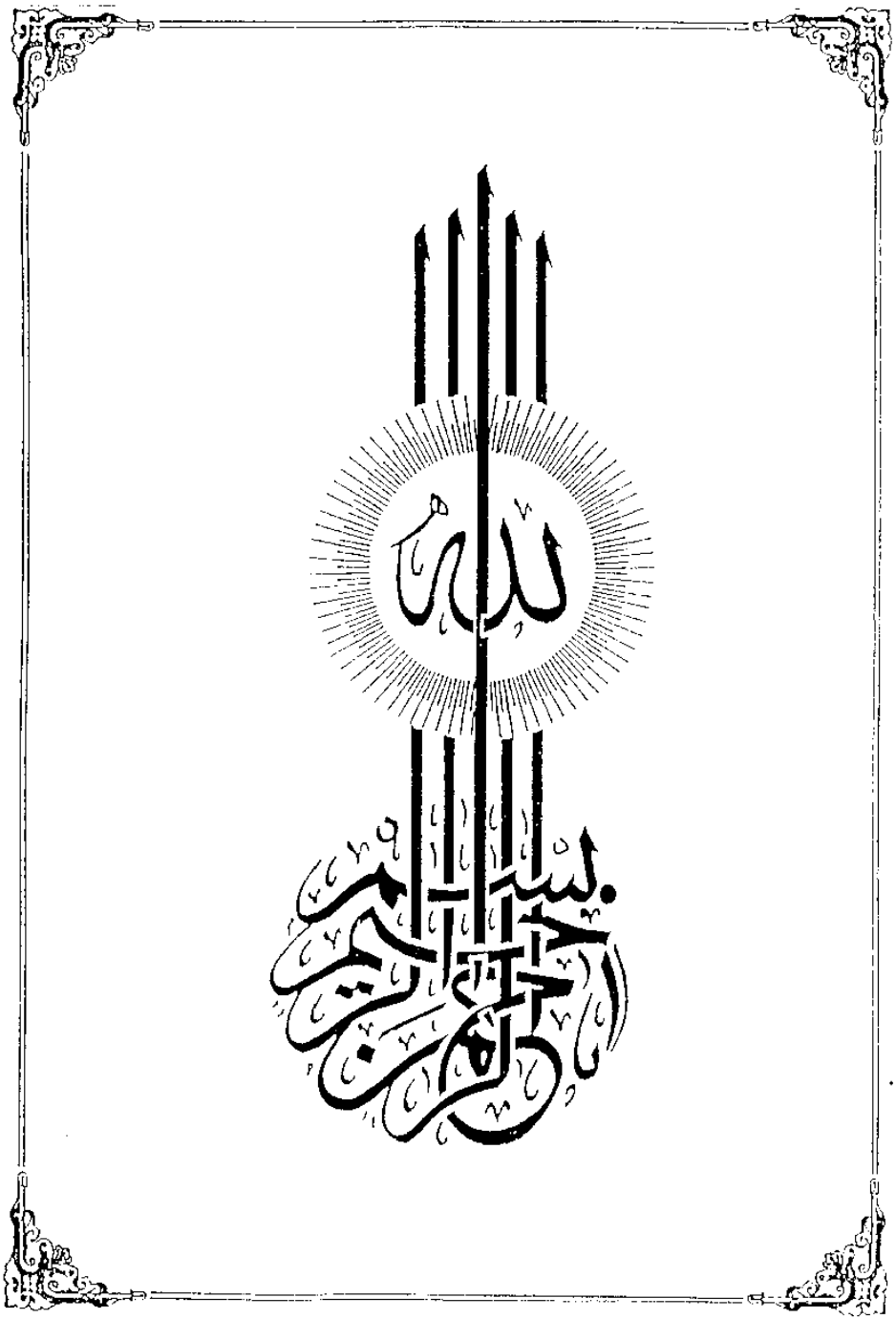

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TABLE OF CONTENTS

INTRODUCTION

When we first meet someone, initially we glance at the face, then studying the rest of the person, we tend to return to the face continually. The concept that "beautiful is good" makes people so face conscious that facial cosmetic improvements are sought after. The maxilla being a major portion of the facial skeleton, it's deformities tend always to cause great disfigurement to the face.

These deformities have always been a challenging problem to the plastic surgeon. They are usually treated by different osteotomies aimed to change the position of the deformed segments to fit into a moral normal position. Inspite of the belief that the blood supply of the maxilla is so abundant that virtually no ischemic sequelae can result from maxillary osteotomies. Yet few authors have tried to study the effect of maxillary osteotomies on the blood supply of the maxilla in experimental animals. *(Bell, (1969)) , (Bell & Levy, (1970)), (Poswillo, (1972)), (Bell, (1975)), (Nelson et al, (1978)), (Sugg et al, (1981)), (Deeb et al, (1981)), (Nanda et al, (1982)) and (Inderson and Lundell, (1983))*. They all agreed on trying to maintain palatal mucosa and labial buccal gingiva for maintaining the vascularity of the mobilized segments.

Few cases of avascular sequelae following maxillary osteotomies were reported in literature. *(Parnes & becker, (1972)), (Hinds and Kent, (1972)), (Westwood and Tilson,*

(1975)) and (Lanigan et al (1990)).

Inspite of the rarity of these cases yet this complication do happen the proper knowledge of the blood supply of the human maxilla will help in avoiding the risk factors that might hinder the vascularity of the mobilized segment in the maxillary osteotomies.

REVIEW OF LITERATURE

Review of Literature

Anatomy of the Maxilla

The Maxilla as reported by ***Williams et al, (1989)*** the largest of the facial bones excepting the mandible. Both Maxillae jointly form the whole upper jaw most of the buccal roof, floor and lateral wall of nasal cavity, orbital floors, inpart the infratemporal and pterygopalatine fossae and inferior orbital and pterygomaxillary fissures. Each has a body and zygomatic frontal, alveolar and palatine processes.

THE MAXILLARY BODY:- (Fig 1, 2)

Roughly pyramidal, has anterior, infratemporal (posterior) orbital and nasal surfaces enclosing the maxillary sinus. The anterior surface:- facing anterolaterally displays inferior elevations overlying the roots of teeth. Above the incisors is a shallow incisive fossa. The depressor septi; to the alveolar border below this is a slip of orbicularius oris is attached and superolateral to it is the nasalis. Lateral to this fossa is a larger, deeper canine fossa separated from it by the

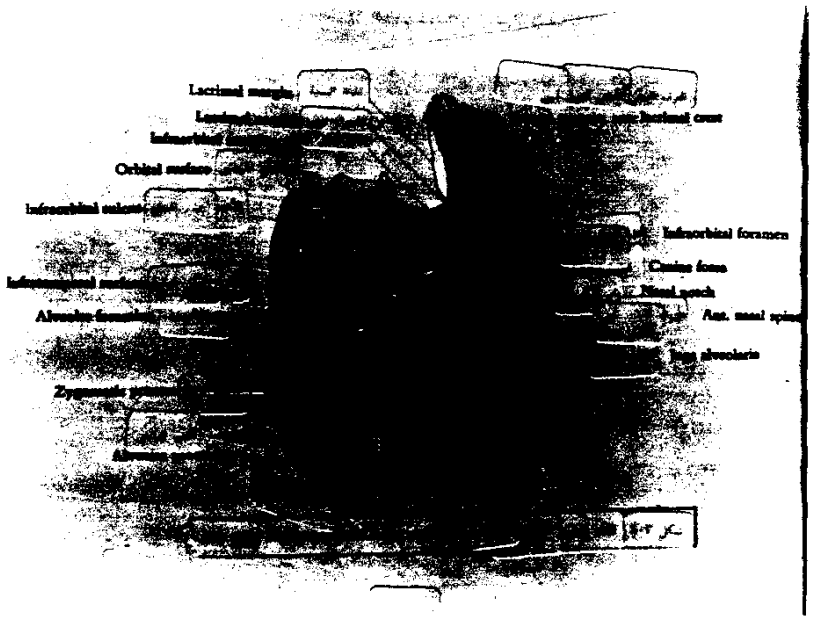

Figure 1: Right Maxilla Lateral View
(Rakhawy , (1978))

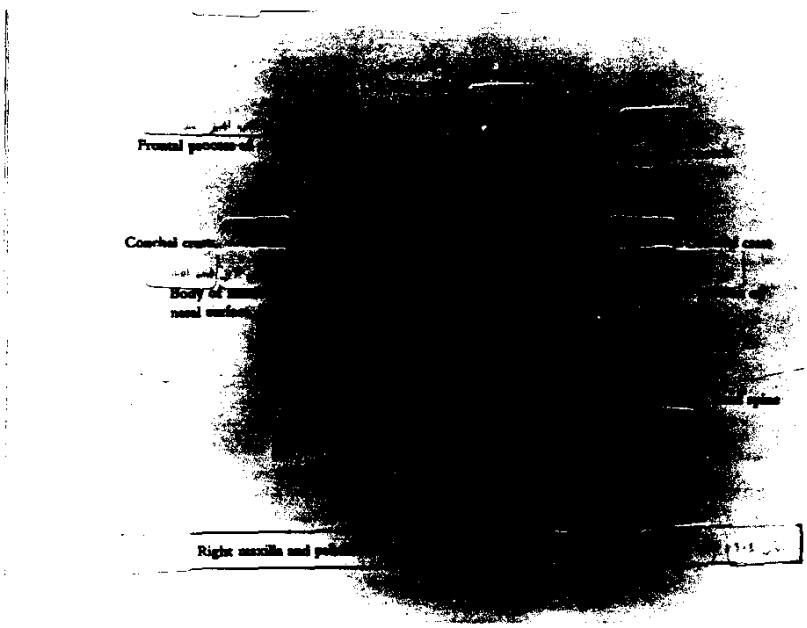

Figure 2: Right Maxilla and Palatine Bones
Palatine, blue
(Rakhawy, (1978))

canine eminence, over the canine socket. In the canine fossa the levator anguli oris is attached. Above it is the infra-orbital foramen, the anterior end of its canal, transmitting infraorbital vessels and nerve. Above the formaena sharp border, dividing anterior and orbital surfaces, is part of the orbit opening rim; attached near it is the levator labii superiors. Medially, the anterior surface ends at a deeply concave nasal notch, ending in a pointed process which, with its fellow forms the anterior nasal spine. To the anterior surface near the notch, the nasalis and depressor septi are attached.

The convex infratemporal surface facing posterolaterally, forms the anterior wall of the infratemporal fossa and is seperated from the anterior surface by maxilla's zygomatic process and a ridge ascending to it from the first molar socket. Near its center are apertures of two or three alveolar canals, containing posterior superior alveolar vessels and nerves. Postero inferior is the maxillary tuberosity, rough superomedially where it meets the palatine bone's pyramidal process; a few fibers of medial pterygoid are attached to it and somtimes it articulates with the lateral pterygoid plate. Above this is the smooth anterior boundary of the pterygopalatine fossa, grooved by the maxillary nerve as it passes laterally and slightly upwards into the infra-orbital groove on the orbital surface.

The orbital surface, smooth and triangular, forms most of the orbital floor. Anteriorly its medial border bears a lacrimal notch, behind which it joins with the lacrimal bone, the ethmoids orbital plate and, posteriorly, the palatine's orbital process. It's posterior border is smoothly rounded, forming most of the anterior edge of the inferior orbital fissures, central is the infra orbital groove. The anterior border is part of the orbital margin, contnious medially with the lacrimal crest of the maxilla's frontal process. The infra-orbital groove, for so named vessels and nerves, begins midway on the posterior border, continuous with a groove on the pasterior surface and passes forward in to the infra orbital margin. Near its mid point the canal has a small lateral branch for the anterior superior alveolar nerve and vessels; this canalis sinusos *(Wood Jones, (1939))* descends in the orbital floor lateral to the infraorbital Canal and curves medially in the anterior wall of the maxillary sinus. It passes below the infraorbital foramen to the margins of the anterior nasal aperture in front of the anterior end of the inferior concha, it then follows the aperture's lower margin to open near the nasal septum infront of the incisive canal. Antermomedial in the orbital surface and lateral to the lacrimal groove, the attachement of inferior oblique muscle may make a small depression.

The nasal surface displays posterosuperiorly the

large, irregular maxillary hiatus leading into the sinus. ~~At the upper hiatal border is part of air sinus. At the~~ upper hiatal border is part of air sinus completed by the ethmoid and lawimal bones, the smooth concave surface below the hiatus is part of the inferior meatus and behind it a rough surface meets the palatine's perpendicular plate, this surface is traversed by a groove descending forwards from the mid posterior border; it is converted in to a greater palatine canal by the palatine's perpendicular plate. Anterior to the hiatus a deep groove, continous above with the lacrimal groove, makes about two-thirds of the circumfrance of the nasolacrimal canal, the rest being the lacrimal's descending part, and the lacrimal process of the inferior nasal concha. This canal leads to the nasolacrimal duct to the inferior meatus. More anterior is an oblique conchal crest for the inferior nasal concha; the concavity below it is part of the inferior meatus; above it the surface is part of the atrium of the middle meatus.

The Maxillary Sinus: (Fig 3)

A large pyramidal cavity has thin walls corresponding to orbital alveolar, facial and infratemporal aspects of the maxilla. Its lateral truncated apex extends into the zygomatic process, somtimes into the zyogmatic bone, its base is medial and is lateral wall of the nasal cavity,

Figure 3: Hard Palate. Oral View from Below
Maxilla, Yellow, Palatine, blue; Sphenoid, Green
(Rakawi, (1978))

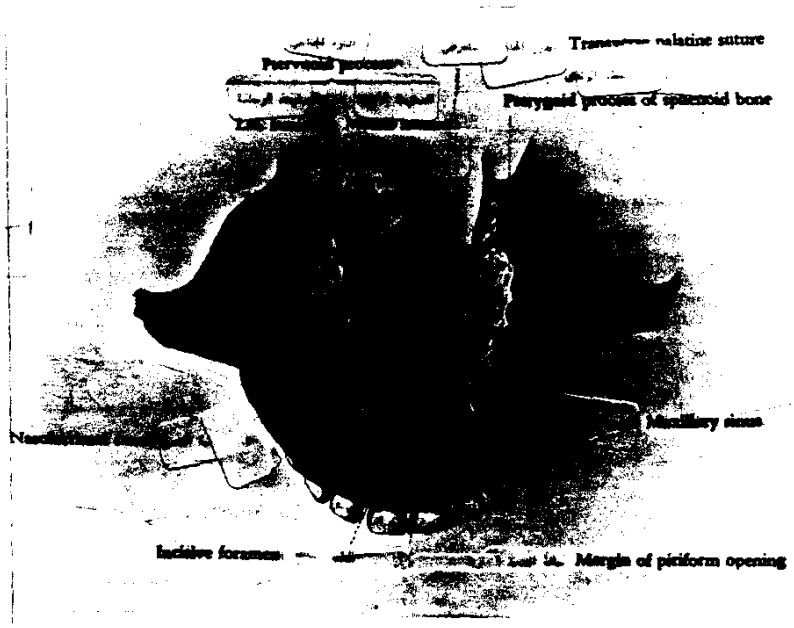

Figure 4: Hard Palate with Inferior Nasal Concha
and Maxillary Sinus, from above Maxilla,
yellow; Palatine, blue; Sphenoid, green
(Rakhawi, (1978))