



Nasalis Muscle in Unilateral Cleft Lip Patients: Anatomical study and Surgical Implications

Thesis

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INTRODUCTION

The anatomic deformity of the unilateral cleft lip primarily involves the soft tissues of the lip and nose. The underlying bony skeleton is also deficient. Anatomical abnormalities contributing to cleft lip nasal deformity include disfigurement and displacement of the lower lateral cartilage, a short columella, and malpositioning of the lesser maxillary segment. Abnormal insertion of the Nasalis muscle has also been described as another contributor to nasal deformity in cleft lip patients (*Bagatain et al., 1999*).

The interplay of embryonic development begins at the 7th and 8th weeks, at which time the first ossification centers in the middle part of the face make contact with the muscles of facial expression. From this point on, further skeletal growth is governed by the influence of the surrounding soft tissue. This is assisted by the embryonic cartilage in the ethmoid region along with the development of the cartilaginous nasal capsule, which represents primary growth centers (*Joos, 1989*). When the muscles are intact, growth stimulants of the nasal septum can be transmitted to the sutures, as well as the nasal, and maxillary periosteum, thus the development of the midface is positively influenced. In a cleft patient, the earliest points of ossification will appear two weeks later when the muscle precursors are already present. So, all the bone formation will take place at the direction and under the

influence of asymmetric muscular forces (*Breitsprecher et al, 1999*). Between the 10th and the 15th weeks of fetal life the deformity of the cleft lip nose is complete and is the same as in a new-born where the only skeletal framework is the nasal cartilaginous capsule. (*Talmant, 2006*).

Kernahan, and Bauer in 1983 described many findings; Rather than forming a complete sphincter around the oral cavity, the Orbicularis Oris muscle fibers are discontinuous and directed upward parallel to the margins of the cleft. These fibers terminate at the base of the nasal ala on the cleft side and the base of the columella on the non cleft side leading to its deviation because of unopposed pull of the muscle.

On the cleft side there is a lack of bony skeletal support for the alar base. It is therefore displaced laterally, inferiorly, and posteriorly when compared to the normal side. The weaker lower lateral cartilage is usually displaced caudally on the cleft side that has relatively shorter medial crus and longer lateral crus which is manifested as a wide and horizontal nostril with a flat alar dome. (*Bagatain et al, 1999*)

On the cleft side the facial envelope loses its anterior support in the midline and collapses influencing in the same way the underlying bony structures. The vestibular lining of the nostril is stretched and vertically elongated. The lower lateral cartilage