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Anatomy of the Median Part of the Septum Depressor Muscle in Aesthetic Surgery

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Abstract. When a person smiles and talks, everyone in his or her own specific way, it can be noticed that the tip of the nose drops and the upper lip shortens, making the nasolabial angle more acute. The importance of the upper lip in the dynamics of the nose makes necessary a more detailed study of the morphology and anatomical relations of the median part of the nasal septum depressor muscle, contributing in this way to new techniques in plastic surgery. The authors proposed to study the anatomy of the nasal septum depressor muscle and its relationship with the dermocartilaginous ligament of Pitanguy and the upper lip, important components of the nasal dynamics of facial expression. In this way they seek to contribute to the treatment of the nasal tip in aesthetic rhinoplasties.

Key words: Anatomy of the nose—Septum depressor muscle—Ligament of Pitanguy—Aesthetic surgery

Introduction

The study of the anatomy of the muscles in the nasolabial region has become important in the last years because of its contribution in aesthetic rhinoplasty to what concerns the search for harmony between the nose and the upper lip, and for the most part, regarding smiling. Llorca [13] has referred to the maxilla above the upper incisor teeth as the generic origin of the septum depressor muscle; it ends at the movable part of the nasal septum, while the median part aids in the dilation of the nostril during deep breathing. According to Davies [6], a segment of the nostril dilator muscle goes up to the membrane part of the septum.

Other authors have described it as an integral part of the nasal muscle [2,3,27]. Therefore, detailed studies of the septum depressor muscle should help in developing new techniques in plastic surgery.

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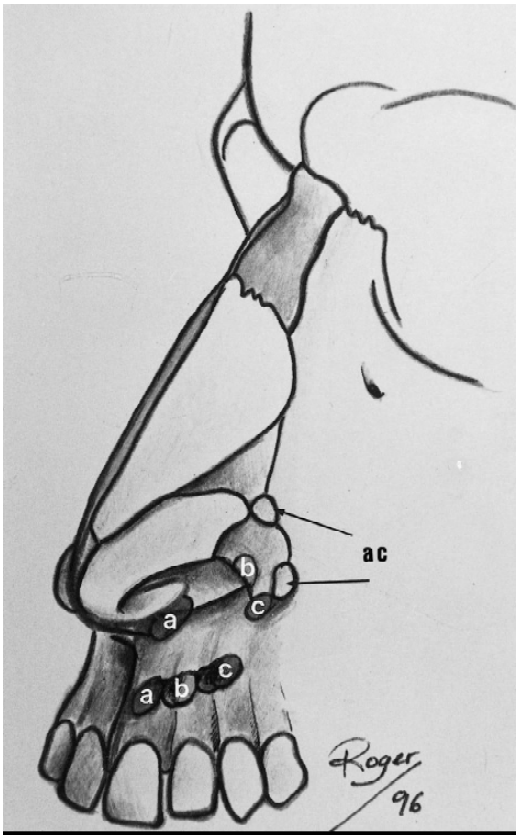
Method

The corpses under study were dissected at the Morphophysiopathology Department at the Santos Medical Sciences School of the Lusíada Foundation and at the Medical Law Institute of Santos. Of the total of 15 corpses, 11 (73.3%) were male and four (26%) female. Concerning race, eight (53.3%) were Caucasian and seven (46.6%) nonCaucasian. Their ages were between 12 and 35, average 23.5. The cause of death occurred by firearms (20%), knife stabbing (20%), or car accidents (60%). The specific area of the body under study was not visibly compromised.

The corpses had been dead up to 72 hours, seven (46.6%) of them were already in 10% formaldehyde, and the others (53.3%) had been preserved between −4° and −8°C.

Access for dissection was made through the mouth by an incision above the superior labial frenum, beginning with a no. 15 blade and with rounded-tipped scissors to expose the muscles of the nasolabial region. The skin of the nose and the upper lip was then resected to expose the ligament of Pitanguy. Photographs were taken from a distance of about 50 cm.

The authors did not take race nor sex into consideration, but only age and cause of death, important data in preserving the anatomy of the studied area.



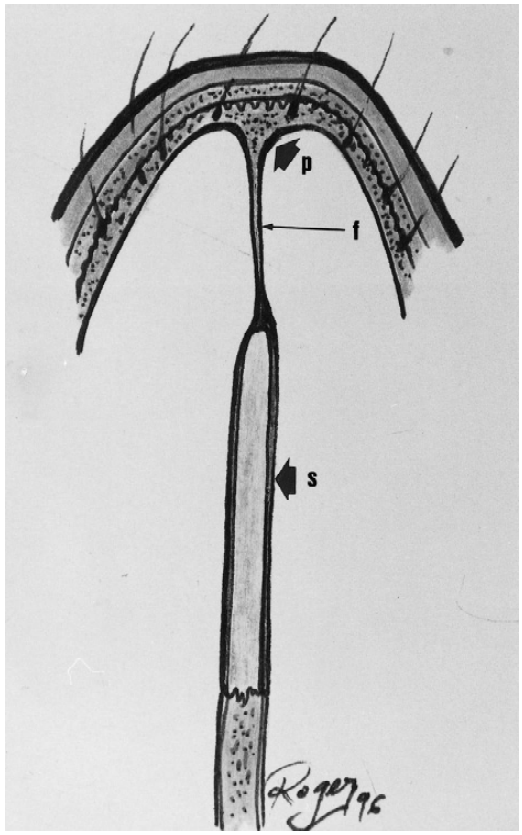
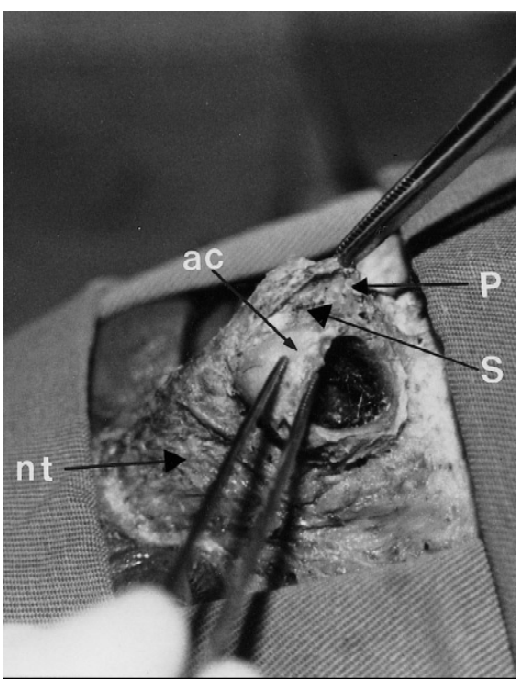


Fig. 1. Observe the origin and terminal insertion of the median part of the muscle in **a, b,** Medial part of the muscle, and **c,** the lateral part of the septum depressor muscle; **ac** = alar cartilage.
Fig. 2. In transversal section of the nose, note in **p** the dermocartilaginous ligament of the nose. **f** = fibrous septum. **s** = cartilaginous septum.



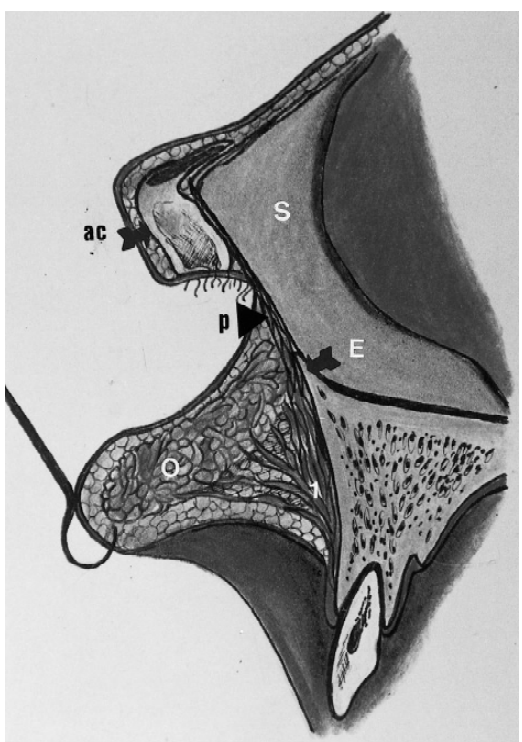
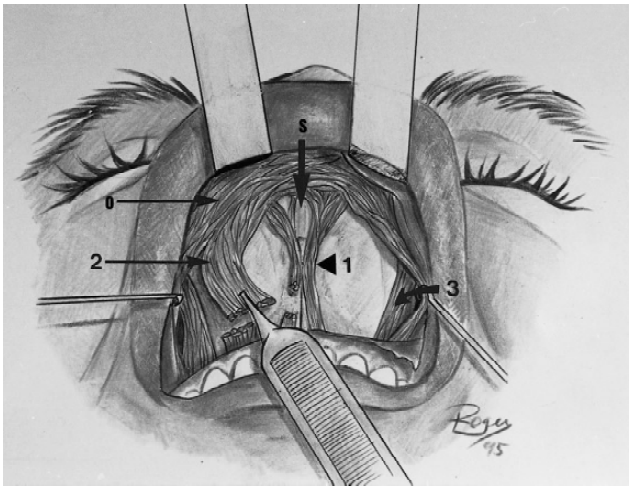
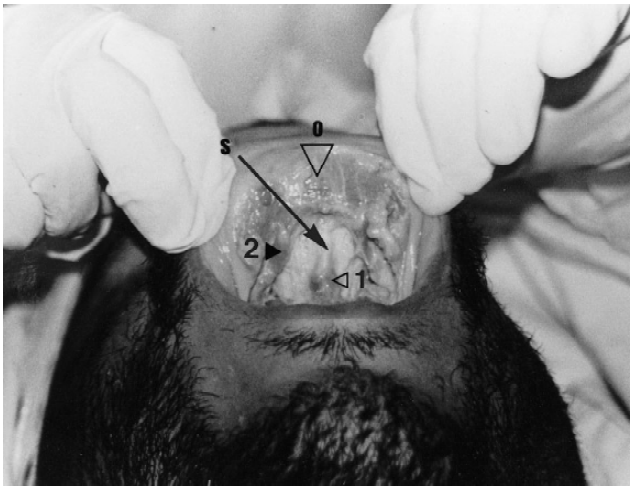


Fig. 3. Observe in the dissection on cadaver. **ac** = alar cartilage. **P** = dermocartilaginous ligament of the nose. **S** = fibrous septum. nt = nasal transverse muscle.
Fig. 4. Observe in median section of the face. **O** = orbicular muscle of the mouth. *P* = dermocartilaginous ligament of the nose. **E** = anterior nasal spine. **ac** = alar cartilage. **S** = fibrous septum; **1** = median part of the septum depressor muscle.





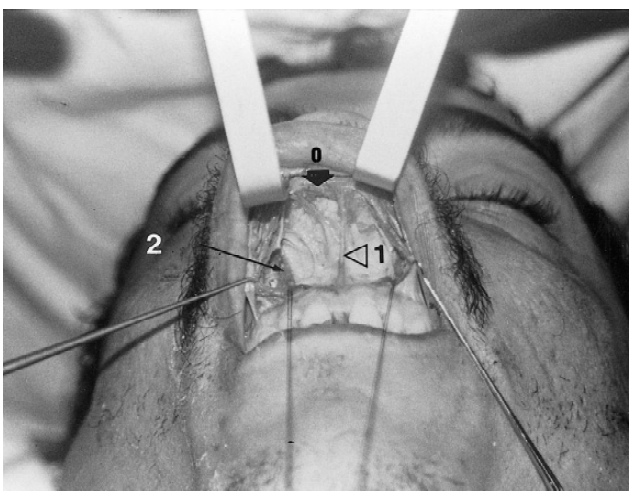


Fig. 5. Note in **S,** the cartilaginous septum. **O** = orbicular muscle of the mouth. **1** = median part of the muscle. **2** = medial part of the muscle. **3** = lateral part of the septum depressor muscle.
Fig. 6. Note in cadaver, **O** = orbicular muscle of the mouth. **S** = cartilaginous septum. **1** = median part of the muscle. **2** = medial part of the muscle.
Fig. 7. Observe in **O,** orbicular muscle of the mouth. **1** = median part of the septum depressor muscle. **2** = lateral part of the muscle.
Fig. 8. Note in **1,** median part of the septum depressor muscle. **2** = medial part of the muscle. **3** = lateral (more posterior) part of the muscle.

Fig. 9. Note the preoperative of the septum depressor muscle's treatment.
Fig. 10. Observe the postoperative of the septum depressor muscle's treatment.

Discussion

The anatomy of the septum depressor muscle has been described in the literature [1–10,13–20,22,23,25–27], but there remain questions about its true function in facial expression and its arrangement concerning origin and terminal insertion. It sometimes has been given little importance in the clinic [26].

Anatomy publications have described it as a muscle composed of three parts (internal, median, and external), inserted on the lower side in the maxilla at the level of the canine grooves and protrusions on both sides and with terminal insertion close to the inferior edge of the piriform fossa [6,9,11,13,14,22,23,25,27].

Benninghoff and Woodburne have described the muscle as the median part of the nasal muscle inserted in the movable part of the septum.

Morris [1] and Rees [21] have described the muscle, in their studies on corpses, as the determining part of the depression of the nasal tip together with the other muscles of the nose. Hollinshead refers to it as a quadrilateral muscle, lying below the orbicular muscle of the mouth, which, upon insertion in the lower part of the septum, determines caudal traction of the nasal tip.

In his studies on corpses, Gonella has mentioned a generic origin of the muscle parts, starting at the median side of the alveolar process of the first incisor on the median side of the first molar (Fig. 1, 5). The median part has, according to the authors, its origin in the median part of the alveolar process of the first incisor above the median part of the alveolar process of the second incisor. Such fibers would direct themselves vertically and obliquely to the median line around the anterior nasal spine, where they would be inserted into the lower half of the medial crus of the alar cartilage and into the deeper layers of the skin.

Letourneau [12] refers to this muscle as the one determining the lowering of the nasal tip in facial expression.

Denecke and Meyer have proposed a surgical technique to correct the nasolabial angle and project the columella by removing the median part of the septum depressor muscle and connective tissue in the area.

Recent studies [17,18,28] have shown the presence of a structure consisting of fibrous tissue in the nose, arranged between the anteromedian edges of the nasal bones and the anterior nasal spine. This fibrous structure, described by Pitanguy, has been named the dermocartilaginous ligament of the nose.

In his studies, Pitanguy refers to the presence of a dense fibrous structure that unites the deep layers of the skin of the middle third of the nose to the junction of the medial cruses of the alar cartilages penetrating anteroposteriorly to join the fibrous nasal septum.

Vogt demonstrates his technique to correct the nasolabial angle sectioning the ligament of Pitanguy at the level of the domus of the nose by a transcolumellar surgical incision.

In our studies we have also been able to observe this connecting structure. We observe that the membranous septum is no more than posterior extension of the quadrangular cartilage, running between the deep skin layers of the median lines of the dorsum, tip, and columella and the anterior nasal spine. The junction between the fibrous septum and the deep skin layers is made by a triangular thickening of the inferior or posterior apex, according to the area observed (dorsal, of the tip, or of the columella) and corresponding to the structure described by Pitanguy (Figs. 2, 3). The inferior part of this ligament—close to the anterior nasal spine—presents as one continuity, by its terminal insertion, with the posterior fibers of the median part of the Nasal Septum Depressor Muscle (Fig. 4). We could also observe a close relation between this ligament and the nasolabial part of the Orbicular Muscle of the mouth (Figs. 6–10). Literature study [24] about the anatomy of the facial expression muscles in lower animals (feline and equine) have demonstrated that it is this median component of the nasal muscle that in human beings has probably differentiated itself in the septum depressor muscle, meanwhile holding on to a vestige of the craniocaudal movements of the snout or muzzle of these animals.

Conclusion

The anatomical relationship between the median part of the septum depressor muscle and the ligament of Pitanguy demonstrates that this muscle is inserted in the distal part of the ligament. Thus it should not be confused with the aponeurosis of this muscle, because it is not an independent structure but continues into the membranous septum.

Therefore, one should consider their treatment as part of aesthetic rhinoplasty because they are important structures of the dynamics of the nose, contributing to the shortening of the upper lip and the lowering of the nasal tip while talking and smiling.

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