



ELSEVIER



Distribution of the internal nasal branch of the infraorbital nerve to the nasal septum: Application to rhinoplasty

Joe Iwanaga ^{a,b,c,*}, Koichi Watanabe ^b, Rod J. Oskouian ^{a,d},
R. Shane Tubbs ^{a,e}

^a Seattle Science Foundation, 550 17th Avenue, Suite 600, Seattle, WA, USA

^b Division of Gross and Clinical Anatomy, Department of Anatomy, Kurume University School of Medicine, 67 Asahi-machi, Kurume, Fukuoka 830-0011, Japan

^c Dental and Oral Medical Center, Kurume University School of Medicine, 67 Asahi-machi, Kurume, Fukuoka 830-0011, Japan

^d Swedish Neuroscience Institute, Swedish Medical Center, 500 17th Ave, Seattle, WA 98122, USA

^e Department of Anatomical Sciences, St. George's University, St. George's, Grenada

Received 18 May 2017; accepted 5 December 2017

KEYWORDS

Rhinoplasty;
Nose;
Cosmetic surgery;
Anatomy;
Trigeminal nerve;
Nasal septum

Summary Background: The course of the nerves along the nasal septum has not been clearly studied, and surgical procedures such as rhinoplasty require a more detailed topography of the nerve supply inside the septum. Therefore, we aimed to investigate the distribution of the internal nasal branch of the infraorbital nerve inside the nasal septum and to define the relationship between it and the nasal cartilages.

Methods: Fourteen sides from eight fresh frozen and embalmed Caucasian cadaveric heads were dissected. The specimens were derived from three males and five females. The ages of the cadavers at death ranged from 65 to 84 years. The course of the internal nasal branch and its relationship between the nasal cartilages were observed using a surgical microscope.

Results: On all sides, the internal nasal branch approached the medial crus of the major alar cartilage from behind and traveled anteriorly below the medial crus of the major alar cartilage while giving off anterior inferior septal, middle inferior septal, and posterior inferior septal branches.

Conclusions: Based on the results of this study, we suggest that procedures of the nasal cavity such as rhinoplasty could be modified to avoid injuring the main trunk of the internal nasal branch of the infraorbital nerve inside the nasal septum.

© 2017 British Association of Plastic, Reconstructive and Aesthetic Surgeons. Published by Elsevier Ltd. All rights reserved.

* Corresponding author. Seattle Science Foundation, 550 17th Avenue, Suite 600, Seattle, WA 98122, USA.
E-mail address: joei@seattlesciencefoundation.org (J. Iwanaga).

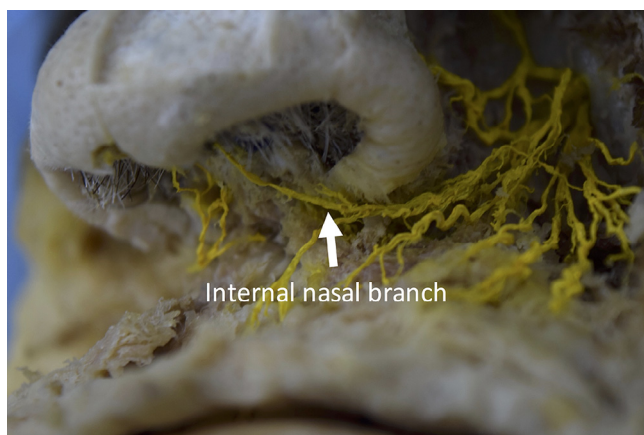


Figure 1 Lateral view (left) of the internal nasal branch of the ION.

Introduction

The infraorbital nerve (ION) is the largest branch of the maxillary division of the trigeminal nerve and gives rise to four branches; palpebral, superior labial, and internal and external nasal branches.¹ The external nasal branch of the ION is distributed to the external nose and ala of the nose, while internal nasal branch (INb) of the ION is distributed to the philtrum, septum and vestibule.^{2,3} Han et al.⁴ investigated the anatomy of the external nasal branch of the anterior ethmoidal nerve, which is a branch of the ophthalmic division of the trigeminal nerve. It is distributed to the tip, ala and vestibule of the nose.⁵ Our previous study⁶ demonstrated the distance from the ala, running course of the INb (Figure 1) and relationship between the related mimetic muscles⁷ and other maxillofacial surgeries. However, the innervation of the nasal septum by the INb of the ION has been scantily investigated. The course of this nerve inside the nasal septum has not been well studied and surgical procedures such as rhinoplasty require a detailed understanding of the topography of this nerve inside the nasal septum, especially between the nerve and cartilages. Therefore, the aim of this study was to investigate the distribution of the INb inside the nasal septum and reveal the relationship between it and the cartilages.

Materials and methods

Fourteen sides from eight fresh frozen and embalmed Caucasian cadaveric heads were dissected (eight sides were embalmed and six sides were fresh frozen). The specimens were derived from three males and five females. The ages of the cadavers at death ranged from 65 to 84 years (mean age; 74.6 ± 7.5 years). All cadavers were confirmed to have no previous history of surgery of the face or nose.

First, the skin and derma layer of the cheek was removed on all sides. Second, the infraorbital foramen was identified below the inferior border of the orbital cavity and underneath the levator labii superioris. Third, the IONs were dissected and INbs were followed into the nasal septum. The course of the INb and relationship between branches and cartilages were observed. All dissections were performed

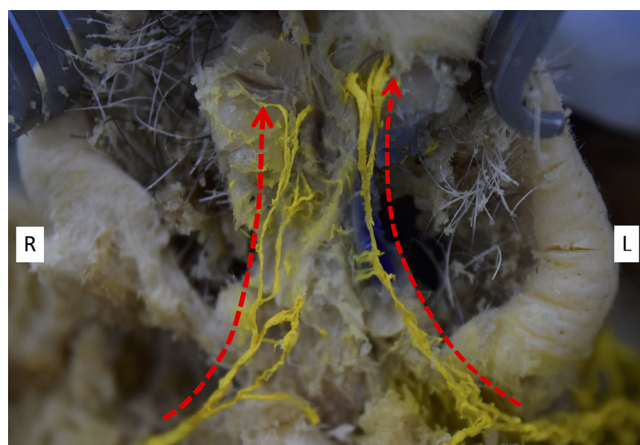


Figure 2 Inferior view of the internal nasal branch of the ION.

using a surgical microscope (OPMI CS NC31, Carl Zeiss, Oberkochen, Germany). One clinical anatomist and one oral and maxillofacial surgeon performed all dissections and measurements. At our institution, Institutional Review Board approval has been waived for all cadaveric studies, and work was performed in accordance with the requirements of the Declaration of Helsinki (64th WMA General Assembly, Fortaleza, Brazil, October 2013).

Results

On all sides, the INb approached the medial crus of the major alar cartilage (MCMAC) from behind and traveled anteriorly below the MCMAC while giving off several branches to the posterior, middle and anterior (tip of the nose) parts of the nasal septum (Figure 2). Here we named an anterior inferior septal (AIS) branch, middle inferior septal (MIS) branch, and posterior inferior septal (PIS) branch (Figures 3 and 4). The PIS branch was given off from the INb after the INb entered into the subcutaneous tissue of the nasal septum and supplied the posterior part of the MCMAC. The MIS branch arose from the INb below the middle part of the MCMAC, ascended medial to the MCMAC and supplied the middle part of the MCMAC and inferior part of the septal cartilage. The AIS branch passed medial to the MCMAC and supplied the anterior part of the MCMAC and nasal tip. The columellar artery ran in the midline between the right and left INbs. The INb entered the nasal septum deeper than the columellar artery (Figure 5). In one specimen (80-year-old female), the communicating branch between right and left sides of the MIS branch was found (Figure 6). On three sides (21.4%), a communicating branch between the branch to the middle part of the septum and anterior ethmoidal nerve was found (Figure 7).

Discussion

Open rhinoplasty with a trans-columellar incision is one of the most common surgical procedures that requires a transverse skin incision onto the nasal septum,^{7,8} and requires a detailed knowledge of surgical anatomy in order to reduce

Download English Version:

<https://daneshyari.com/en/article/8806636>

Download Persian Version:

<https://daneshyari.com/article/8806636>

[Daneshyari.com](https://daneshyari.com)