



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

*International Journal of Current Research*  
Vol. 11, Issue, 03, pp.2611-2612, March, 2019

DOI: <https://doi.org/10.24941/ijcr.34955.03.2019>

**INTERNATIONAL JOURNAL  
OF CURRENT RESEARCH**

## RESEARCH ARTICLE

### THE USEFULNESS OF THE ENDOSCOPIC VISUALIZATION OF VOMERONASAL ORGAN BEFORE SEPTOPLASTY

<sup>\*</sup><sup>1</sup>Francesco Asprea, <sup>2</sup>Barbara Gaudio, <sup>3</sup>Francesco Carfi, <sup>4</sup>Gregorio Micali and <sup>5</sup>Annunziata Maceri

<sup>1</sup>Head of Division of Otolaryngology C.O.T. Clinic – via Ducezio, 1, Messina, Italy, ENT Consultant Marrelli Health – Via G. Da Fiore, Crotone, Italy

<sup>2</sup>Speech Therapist, Private Practitioner, Roccella Ionica, Italy

<sup>3</sup>Senior Consulting of Division of Otolaryngology C.O.T. Clinic – Via Ducezio, 1, Messina, Italy

<sup>4</sup>Co- Director of Division of Otolaryngology, Head of the Maxillofacial Surgery Unit C.O.T. Clinic – Via Ducezio, 1, Messina, Italy

<sup>5</sup>Co- Director of Division of Otolaryngology, IRCCS Bonino-Pulejo, Messina, Italy

#### ARTICLE INFO

##### Article History:

Received 03<sup>rd</sup> December, 2018

Received in revised form

06<sup>th</sup> January, 2019

Accepted 19<sup>th</sup> February, 2019

Published online 31<sup>st</sup> March, 2019

##### Key Words:

Jacobson, Vomeronasal, Nose, Surgery, Septoplasty, Endoscopy.

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**Citation:** Francesco Asprea, Barbara Gaudio, Francesco Carfi, Gregorio Micali and Annunziata Maceri, 2019. "The usefulness of the endoscopic visualization of vomeronasal organ before septoplasty", *International Journal of Current Research*, 11, (03), 2611-2612.

#### ABSTRACT

The purpose of this study is to recognize with nasal endoscopy the presence of vomeronasal organ before any surgical procedure of septoplasty. Ludvig Jacobson published a scientific work in Danish in 1813, entitled "Anatomical description of a new organ in the nose of domesticated animals" but Kolliker can be considered the discoverer of the vomeronasal organ in humans. Potiquet described in 1891 the possibility of locating and identifying the Jacobson channel in the living man and hypothesized its possible role in the pathogenesis of some nasal septum lesions. The importance of this anatomical structure in nasal pathology and nasal surgery justifies its preoperative systematic research in order to carry out a conservative and respectful surgery.

## INTRODUCTION

The importance of the vomeronasal organ of Jacobson is discussed by scientists. Jacobson (Bhatnagar and Smith, 2003; Jacobson *et al.*, 1998; Døving and Trotier, 1998; Trotier *et al.*, 2000) identified the organ in animals and stated that it was an organ that is absent or has vestigial functions in humans. Other scientists among whom Potiquet (Potiquet, 1891; Stoyanov *et al.*) affirm instead that the organ, although vestigial, has a fundamental importance in some pathologies of the nasal septum and that its presence must be taken into account during surgical maneuvers on the nasal septum as caustications of nasal veins and septoplasty.

We routinely carry out a nasal endoscopy before any septoplasty in order to better define the anatomical arrangement of the nasal structures. The vomeronasal organ is an anatomical landmark that we always research in nasal endoscopy.

**\*Corresponding author: Francesco Asprea**

Head of Division of Otolaryngology C.O.T. Clinic – via Ducezio, 1, Messina, Italy, ENT Consultant Marrelli Health – Via G. Da Fiore, Crotone, Italy.

## MATERIALS AND METHODS

From 1 January 2016 to 31 December 2018 we performed 180 septoplasty. Patients were always subjected to a nasal endoscopy prior to the surgical procedure and the vomeronasal organ was routinely searched. We studied all the patients with flexible rhinofibroscopy. The exams were videotaped and reviewed remotely in order to highlight the presence of the vomeronasal organ, either unilaterally or bilaterally. Patients had a gender distribution of 120 (66, 66 %) men and 60 women (33,33 %).

## RESULTS

On the 180 patients studied the vomeronasal organ was found monolaterally on the right in 25 cases (13,88 %), on the left in 22 cases (12,22 %) and bilaterally in 5 cases (2,78 %) for a total of 52 patients (28,88 %) without significant differences between the two sexes (Fig. 1, 2). In no case the endoscopic observation after the septoplasty showed the presence of a vomeronasal organ not previously visualized. None of the patients undergoing septoplasty presented postoperative complications such as bleeding, septal perforation, septo-turbinal synechia or significant residual deviation.

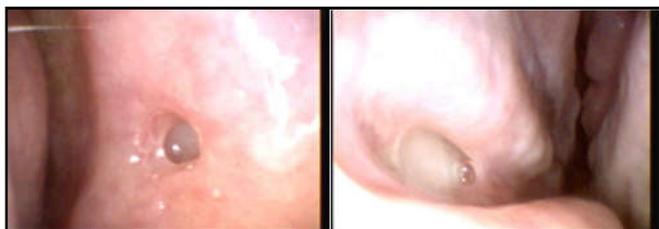


Fig. 1, 2. Endoscopic visualization of the vomeronasal organ

## DISCUSSION

The data obtained are superimposable to those reported in the literature. Stoyanov (Stoyanov *et al.*) find a similar percentage of reporting of vomeronasal organ in a Bulgarian population; Garcia-Velasco (Garcia-Velasco and Mondragon, 1991; Garcia-Velasco and Garcia-Casas, 1995) finds the vomeronasal organ in almost all the cases observed; among the cases in which the anatomical structure had not been highlighted, were many cases with septal deformities; in most of which, after surgical correction of the septal deformity, was possible to find the vomeronasal organ. In our experience we did not find any difference between preoperative and postoperative findings probably because the preoperative investigation performed with flexible endoscope is, in our hands, sufficiently accurate to identify vomeronasal organ even when it is hidden behind the nasal septum deformity. Anatomic investigations on cadavers, especially if correlated by histological findings, give a much higher percentage of vomeronasal organ findings. For the identification of the vomeronasal organ we followed the original indications of Potiquet (Potiquet, 1891; Stoyanov *et al.*) which identifies a rhomboidal area of about 7 mm of height and 8 of depth in antero-posterior direction within which the vomeronasal organ can be searched; this area is located at about 23 mm from the angle formed between the cartilaginous septum and the upper lip. The normal zone of the vomeronasal organ of Jacobson corresponds for large lines with the locus Valsalvae or area of Little, seat of vascular anastomoses between the tributary nasal vascular territory of the external carotid artery and the tributary of the internal carotid where there are capillaries at subepithelial localization (Kubo capillaries) frequent site of anterior epistaxis.

During a septoplasty the approach to this area must be as conservative as possible following an essentially extramucous technique as suggested by Garcia-Velasco (Garcia-Velasco and Mondragon, 1991; Garcia-Velasco and Garcia-Casas, 1995); this allows not only to avoid injuries in the region of the vomeronasal organ which is often present even when clinically not visualized, but also to reduce the risk of iatrogenic perforations of the nasal septum. Endoscopic septoplasty (Asprea *et al.*, 2018) allows an even more conservative approach to septal deformity, allowing its correction with less morbidity and a lower risk of lesion of the vomeronasal organ.

## Conclusion

From the data we elaborate and from the examination of the literature certainly derives the evidence of the need for greater attention to the vomeronasal region in nasal surgery. Certainly we must consider this atomic entity during a septoplasty because forgetting it can cause complications such as septal perforation or abscess or septal hematoma. We propose a prudent surgical approach both in case of traditional septoplasty and in case of endoscopic septoplasty. In case of traditional septoplasty, we perform essentially sub-pericondral and subperiosteal maneuvers with the least possible removal of cartilage and bone material in the region of the joint between vomer and quadrangular cartilage. In case of endoscopic septoplasty we locate the vomeronasal organ outlet and, if possible, we perform the septal incision and the subpericondral and subperiosteal maneuvers without damaging the vomeronasal structures. In both cases these principles of conservative surgery are useful in preventing iatrogenic complications.

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