

## MUCOCELE IN PEDIATRIC PATIENTS: CASE SERIES ANALYSIS

A. FRANCHELLA<sup>1</sup>, S. PELLEGRINELLI<sup>1</sup>, F. CARINCI<sup>2</sup>,  
I. ZOLLINO<sup>2</sup>, G. CARNEVALI<sup>2</sup>, V. CANDOTTO<sup>2</sup>,  
S. FRANCHELLA<sup>2</sup>, V. PINTO<sup>3</sup>, G.P. MORSELLI<sup>3</sup>

<sup>1</sup>*Department of Pediatric Surgery, University of Ferrara, Ferrara, Italy*

<sup>2</sup>*Department of D.M.C.C.C., Section of Maxillofacial and Plastic Surgery, University of Ferrara, Ferrara, Italy*

<sup>3</sup>*University of Bologna, School of Plastic Surgery, Plastic Surgery Unit S. Orsola Hospital, Bologna, Italy*

**The mucocele, a mucus accumulation from the salivary gland, represents a common lesion of the oral cavity. From 44 % to 79 % of mucoceles occur on the lower lip. There is no gender predilection and it can arise at any age. Mucoceles do not cause direct obstruction of salivary flow, and the amount of secretion that can be extravasated is limited by the elasticity of the surround tissues. In the period between January 2001 December 2010, 21 patients underwent to ulcer treatments at the Pediatric Surgery Unit, S Anna Hospital, Ferrara, Italy. Patients included 9 females and 12 males. Age ranged from 5 months to 13 years with a mean value of 7 years. All were located in the lower lip. Mucocele were treated with surgical excision, 13 under general anesthesia and the remaining under local anesthesia. Several techniques have been proposed: initial cryosurgical approach, CO2 laser, marsupialization and complete resection: this last is in most cases the best option.**

The mucocele, a mucus accumulation from the salivary gland, represents a common lesion of the oral cavity. There are two mechanisms for the development of these lesions: mucus extravasation and mucus retention (1, 2).

According to several studies, the lower lip is the region most affected by mucoceles (2-4). However, rare cases of mucoceles involving the upper lip, palate, retromolar region, buccal mucosa, lingual frenum, and dorsal tongue have been reported (4-6). In particular, "ranula" designates mucoceles located on the floor of the mouth (7). Ranulas are generally related to the duct systems of the sublingual salivary glands and, less frequently, to the submandibular gland and minor salivary gland ducts of the floor of the mouth. A ranula manifests as a cup-shaped fluctuant bluish swelling on the floor of the mouth. Ranulas tend to be larger than mucoceles located in other regions of the mouth, reaching some centimetres in diameter (8).

From 44 % to 79 % of mucoceles occur on the lower lip. There is no gender predilection and it can arise at any age (9). Mucoceles do not cause direct obstruction

of salivary flow, and the amount of secretion that can be extravasated is limited by the elasticity of the surround tissues. As a result, although these lesions can become quite large, they are usually of small size (10).

The primary cause of mucocele formation involves mucus extravasation from accessory salivary glands and is generally regarded as being of traumatic origin, particularly related to lip biting (9).

Mucus extravasation triggers a secondary inflammatory reaction predominantly consisting of mononuclear cells in surrounding connective tissue, followed by agranulation tissue-type reaction that culminates in the formation of a fibrous capsule around the mucin deposit, conferring a cyst-like aspect to the lesion (4). The diameter of mucoceles ranges from a few millimeters to centimeters (4, 10). Many patients report the periodic discharge of viscous fluid from the lesion.

Regarding the mucus retention cyst it appears to be caused by epithelial proliferation of a partially obstructed salivary duct, which becomes unable to adequately drain the saliva produced, leading to ductal dilatation and

*Key words: Mucocele, wound, gland, salivary, cyst, skin*

*Corresponding author:* Prof. Francesco Carinci, M.D  
Department of D.M.C.C.C.  
Section Maxillofacial and Plastic Surgery,  
University of Ferrara  
Corso Giovecca 203 44100 Ferrara Italy  
E-mail: [crc@unife.it](mailto:crc@unife.it) Web: [www.carinci.org](http://www.carinci.org)  
Phone: +39.0532.455874 Fax: +39.0532.455876

swelling (11). The disparate site and age incidences of extravasation and retention mucocoeles suggest that these two types are not related and have a different pathogenesis (12).

On clinical representation, the mucocoele appears as an asymptomatic nodule with a pink or bluish color; the size may vary. The nodule often arises within a few days after minor trauma. Once produced, it may unchanged for months unless it is treated. If the content of the cyst is drained, it usually consists of thick, mucinous material. Some lesions regress and enlarge from time to time and may disappear after traumatic injury, which results in drainage (13).

Regardless of the etiology, appropriate treatment depends on identification of the salivary gland in which the lesion originates and on appropriate elimination of the source of secretions (8).

Surgical excision of the pseudocyst and supplier gland has been the main treatment option. However, other options have been reported in the literature such as marsupialisation, cryosurgery, micromarsupialisation, CO2 laser vaporization (11) and corticosteroid injections as an alternative to surgery (9).

Aim of this retrospective study is to assess the clinical outcome in a series of patients affected by mucocoele and discusses the pertinent literature.

## MATERIALS, METHODS AND RESULTS

In the period between January 2001 December 2010, 21 patients underwent to mucocoele excision at the Pediatric Surgery Unit, S Anna Hospital, Ferrara, Italy.

### *Patients*

Patients included 9 females and 12 males. Age ranged from 5 months to 13 years with a mean value of 7 years. All were located in the lower lip.

### *Treatment*

Mucocoele were treated with surgical excision, 13 under general anesthesia and the remaining under local anesthesia.

## DISCUSSION

Mucocoeles are defined as mucus-filled cavities that can appear in the oral cavity, appendix, gallbladder, paranasal sinuses or lacrimal sac (1, 14). They are characterized by the accumulation of liquid or mucoid material, giving rise to a rounded, well circumscribed transparent and bluish-colored lesion of variable size. The consistency is typically soft and fluctuant in response to palpation. Mucocoeles are painless and tend to relapse (10). The incidence is high, indeed, mucocoeles are the most common minor salivary gland disorder, and represent the second most frequent

benign soft tissue tumours of the oral cavity, following irritative fibromas (1, 5, 10).

Etiologically, most mucocoeles are considered to be secondary to traumatic or obstructive disorders of the mainly minor salivary glands and the preferential location being the humid mucosa of the lower lip (10). Based on the underlying etiopathogenesis, these lesions classically have been divided into retention mucocoeles and extravasation mucocoeles (1, 10).

Mucocoeles are more frequently treated by surgical excision of the lesion and careful dissection of the adjacent minor salivary glands affected (1, 7). However, recurrence can occur and a new surgical intervention is necessary (1).

In the case of "ranula", treatment consists of surgical removal of the sublingual gland and/or marsupialization (1).

There are different treatment options, such as cryosurgery, intralesional corticosteroid injection, marsupialization and micro-marsupialization of the mucocoele, conventional surgical removal of the lesion and laser ablation (10).

Some Authors recommend an initial cryosurgical approach or the intralesional injection of corticosteroids (10). However, the number of relapses associated with these techniques is very high, and most cases, therefore, require re-intervention in the form of conventional surgery to ensure complete resolution of the lesions. On the other hand, Botazzo et al. (15) propose micromarsupialization as an ideal treatment alternative for mucocoeles in pediatric patients, since the technique is rapid, simple, and offers good results. Another option is the marsupialization of large mucocoeles, with the purpose of making surgery less invasive, and thus preventing damage to neighboring anatomical structures such as the labial branch of the mental nerve (1, 10). Using the scalpel, Baurmash (1) proposes complete resection of the mucocoele through careful dissection, ensuring that both the affected and neighboring glands are removed, along with the pathological tissue, before primary closure of the wound. This minimizes the risk of relapse. In addition, special care is required to avoid damaging of other glands or ducts with the suture needle, since this may become a cause of recurrence.

The CO2 laser often has been used in oral soft tissue surgery. However, it has been little used to date for treating oral mucocoeles (10). This laser is strongly absorbed by water, as a result of which its effect is scanty penetrating, and action is essentially confined to the surface of the soft tissues.

Since most of all mucocoeles are extravasations cysts lacking an epithelium, cyst exeresis is not obligate, and moreover may prove complicated or incomplete. Total removal of the gland originating the lesion is required,

however, in order to prevent relapses(16).

#### REFERENCES

1. Baumash HD. Mucoceles and ranulas. *J Oral Maxillofac Surg* 2003; 61:369-78.
2. Jones AV, Franklin CD. An analysis of oral and maxillofacial pathology found in children over a 30-year period. *Int J Paediatr Dent* 2006; 16:19-30.
3. Gatti AF, Moreti MM, Cardoso SV, Loyola AM. Mucus extravasation phenomenon in newborn babies: report of two cases. *Int J Paediatr Dent* 2001; 11:74-7.
4. Hayashida AM, Zerbinatti DC, Balducci I, Cabral LA, Almeida JD. Mucus extravasation and retention phenomena: a 24-year study. *BMC Oral Health*; 10:15.
5. Baumash H. The etiology of superficial oral mucoceles. *J Oral Maxillofac Surg* 2002; 60:237-8.
6. Zancope E, Pereira AC, Ribeiro-Rotta RF, Mendonca EF, Batista AC. Mucocele in posterior dorsal surface of tongue: an extremely rare location. *J Oral Maxillofac Surg* 2009; 67:1307-10.
7. Nico MM, Park JH, Lourenco SV. Mucocele in pediatric patients: analysis of 36 children. *Pediatr Dermatol* 2008; 25:308-11.
8. Anastassov GE, Haiavy J, Solodnik P, Lee H, Lumerman H. Submandibular gland mucocele: diagnosis and management. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000; 89:159-63.
9. Alves LA, Di Nicolo R, Ramos CJ, Shintome L, Barbosa CS. Retention mucocele on the lower lip associated with inadequate use of pacifier. *Dermatol Online J*; 16:9.
10. Yague-Garcia J, Espana-Tost AJ, Berini-Aytes L, Gay-Escoda C. Treatment of oral mucocele-scalpel versus CO2 laser. *Med Oral Patol Oral Cir Bucal* 2009; 14:e469-74.
11. Guimaraes MS, Hebling J, Filho VA, Santos LL, Vita TM, Costa CA. Extravasation mucocele involving the ventral surface of the tongue (glands of Blandin-Nuhn). *Int J Paediatr Dent* 2006; 16:435-9.
12. Jinbu Y, Kusama M, Itoh H, Matsumoto K, Wang J, Noguchi T. Mucocele of the glands of Blandin-Nuhn: clinical and histopathologic analysis of 26 cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2003; 95:467-70.
13. Huang IY, Chen CM, Kao YH, Worthington P. Treatment of mucocele of the lower lip with carbon dioxide laser. *J Oral Maxillofac Surg* 2007; 65:855-8.
14. Ozturk K, Yaman H, Arbag H, Koroglu D, Toy H. Submandibular gland mucocele: report of two cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2005; 100:732-5.
15. Delbem AC, Cunha RF, Vieira AE, Ribeiro LL. Treatment of mucus retention phenomena in children by the micro-marsupialization technique: case reports. *Pediatr Dent* 2000; 22:155-8.
16. Boneu-Bonet F, Vidal-Homs E, Maizcurrana-Tornil A, Gonzalez-Lagunas J. Submaxillary gland mucocele: presentation of a case. *Med Oral Patol Oral Cir Bucal* 2005; 10:180-4.