Treatment of mucus retention phenomena in children by the micro-marsupialization technique: case reports

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Abstract

The purpose of the present study was to emphasize the technique of micro-marsupialization as an alternative for the treatment of mucus retention phenomena. Out of 41 patients, 14 were selected for treatment by the micro-marsupialization technique on the basis of clinical criteria. Patient age ranged from 5-9 years. The technique was performed as follows: the area was disinfected with 0.1% iodine; a topical anesthetic was applied to cover the entire lesion for approximately 3 min; a 4.0 silk suture was passed through the internal part of the lesion along its widest diameter; and a surgical knot was made. Of the original 14 patients treated by the micro-marsupialization technique, 12 presented full regression one week after treatment. Recurrence occurred in two cases. It was possible to conclude that the micro-marsupialization technique is an alternative to be considered, especially in pediatric dentistry. (Pediatr Dent 22:155-158, 2000)

Among the benign lesions involving the oral cavity are the mucus retention phenomena, lesions that involve the salivary glands and their respective ducts. Clinically, these lesions may be classified as mucocele or ranula. Mucocele consists of a volumetric increase caused by the accumulation of mucus inside the tissues. The ranula is a form of mucocele specifically localized on the floor of the mouth. Its name derives from the Latin "rana" for frog, due to the similarity of the clinical aspect of the lesion to a frog belly. The literature also reports a similarity between the voice of the patient altered by the difficulty in phonation and the croaking of a frog.[1]

On the basis of their microscopic characteristics, these lesions can be classified as mucus retention or mucus extravasation cysts, the former being characterized by the presence of epithelial tissue and the latter, which have been reported to occur at higher frequency, by a covering with granulation tissue.[2-4]

The major etiologic factor is related to trauma which provokes rupture and/or occlusion of the excretory duct of the salivary gland involved, leading to extravasation and accumulation of salivary mucus inside connective tissue.[5]

These lesions preferentially occur among white people of both sexes, with some papers reporting a slight predominance among females.[2, 6] With respect to age, they mainly occur during the second and third decades of life.[3] The preferential localization of mucocele is the lower lip, but it may also be found on the tongue, palate, and buccal mucosa. As mentioned earlier, ranulas specifically occur on the floor of the mouth.[2,3,5]

The lesions have a sessile or pedicled base, are of flaccid or fibrous consistency, and may reach more than 1 cm in size.[5] They have clearly defined limits and a smooth surface and are usually lined with a thin mucosa. Evolution is rapid or slow and painless, with periods of remission and exacerbation.[5] If the lesion is localized superficially it presents a bluish coloring[3] due to the superficial capillary network that appears through it.[5] When located more deeply in tissues, its color is similar to that of the mucosa.[3] In the presence of trauma, the surface may become irregular with a pink coloring. The ranula, located unilaterally on the floor of the mouth, may reach the opposite side of the floor and give the false impression of bilaterality when the volume of the lesion is large. In this case, there may be a raise of the tongue and the patient usually reports difficulties in phonation and deglutition.[7]

According to Shafer,[3] microscopic analysis reveals the presence of polymorphonuclear leukocytes, lymphocytes, and plasmocytes and the lumen of the cavity is filled with an eosinophilic clot mainly containing leukocytes and mononuclear phagocytes. The results of histopathological analysis show a predominance of lesions surrounded by granulation tissue.[2-4] The lesions characterized by an epithelial lining preferentially occur among individuals older than 40 years.[2,4]

Prognosis is favorable and several treatments have been proposed in the literature, such as excision of the lesion associated or not with removal of the gland involved,[1,3,8] marsupialization,[1,8,9] cryosurgery,[10-12] laser,[13,14] and micro-marsupialization.[5,15]

Redish[16] reported that the placement of a wire suture through the lesion is a method of treatment that may be utilized for ranulas. Morton & Bartley[17] stated that ranula can be treated with the placement of a silk suture into the dome of the cyst. The silk suture technique was named micro-marsupialization by Cardoso in 1974, and considered a choice for treating mucoceles. A suture was passed through the lesion and it was maintained for at least 10 days.[15] Castro[5] indicates the micro-marsupialization technique for mucoceles with more than 1 cm in size and for ranulas.

The aim of the present study was to emphasize the technique of micro-marsupialization as an alternative for the treatment of mucus retention phenomena.

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Fig 1. Mucocele on the lower lip in a 7-year old girl. Clinical appearance.

Fig 2. Topical anesthetic covering the entire lesion.

Fig 3. Passage of a 4.0 silk suture through the internal part of the lesion.

Report of cases

Forty-one patients with mucus retention phenomena were treated in the Pediatric Dentistry Clinic of the School of Dentistry of Araçatuba–UNESP from 1990-1998. Of these, 14 patients (12 girls and 2 boys, ages ranging from 5-9 years) were selected for treatment by the micro-marsupialization technique[5,15] on the basis of certain clinical characteristics of the lesions (Fig 1), such as presence of a smooth surface, thin mucosa, bluish color or mucosa-like color, sessile base, and flaccid consistency and localization (lower lip, ventral surface of the tongue, and floor of the mouth). The technique is contraindicated for lesions of fibrous consistency, with a traumatized surface and pedicle base, and for those found on the palate and buccal mucosa. Five lesions were located on the lower lip, 1 on the ventral surface of the tongue, and 8 on the floor of the mouth (ranula).

The technique was performed as follows: The area was disinfected with 0.1% iodine; a topical anesthetic (Emla, prilocaine and lidocaine—Astra; or Dorfree, 20% benzocaine—SSWhite) was applied to cover the entire lesion for approximately 3 min (Fig 2); a 4.0 silk suture was passed through the internal part of the lesion along its widest diameter, not too deep so the underlying tissue is not reached (Fig 3); and a surgical knot was made (Fig 4). The suture was then removed 7 days later (Fig 5).

Of the 14 patients treated by the micro-marsupialization technique, 12 presented full regression one week after treatment. While the technique was being applied, the lesions presented a considerable reduction in volume due to the immediate extravasation of mucus. A slight inflammation in the area was observed after the removal of the suture. No symptom or local hemorrhage was observed. Recurrence occurred in two cases, both involving lesions on the floor of the mouth. Treatment by micro-marsupialization was repeated, leading to a successful outcome.

Clinical analysis of the region involved by the lesion after treatment by the technique described suggested that no deformity occurred in the area after passage of the suture, and no pain or infectious processes were reported. None of the lesions had been treated previously. Follow-up has been done since the performance of the technique every six months (Fig 6); total period ranged from 12 months to 5 years.

Discussion

The literature reports that phenomena of salivary retention affect both sexes in a similar way.[2,3] The present series showed a predominance of females, corresponding to approximately 70% of the 41 cases.

The micro-marsupialization technique was selected because it is of simple execution, less traumatic, and well tolerated by the patient. These are fundamental features to be considered in pediatric dentistry. Simple incision and drainage will result in recurrence of mucus retention phenomena.[16] The introduction of a suture presumably maintains a tract while permitting an epithelial tract to form between the surface and the underlying salivary glandular tissues.[17]

The micro-marsupialization technique is not contraindicated for children with systemic diseases, since it is a simple procedure and any of the other treatments for ranulas or mucoceles will be more invasive than that technique.

Fig 4. Surgical knot immediately after the performance of the technique.

Fig 5. Follow-up of 7 days.

Fig 6. Three years postoperative there is normal healing and no evidence of recurrence.

Information from the history is very important in diagnosis. Questions concerning trauma in the lower lip and the presence of periods of remissions should be performed.

The observation of the characteristics of the lesion during clinical examination is of extreme importance for a successful treatment, otherwise unsuccessful outcomes are frequent. Although salivary gland neoplasms in childhood and adolescence are rare,[18] especially in the minor salivary glands,[19] the micro-marsupialization technique is contraindicated for lesions located in palate and buccal mucosa, because of the possibility of a clinical misdiagnosis and a missing benign or malignant salivary gland tumor that are more frequently found in those areas.[20,21] If the micro-marsupialization technique is not indicated after thorough clinical examination of the lesion, other treatments such as excision of the lesion associated or not with removal of the gland involved,[1,3,8] marsupialization,[1,8,9] cryosurgery[10-12] or laser,[13,14] should be chosen.

An important factor observed during the execution of the technique is that only topical anesthesia over the lesion needs to be applied, a fact that greatly favors cooperative behavior on the part of children. The mucus content of the lesion is the reason there is only need to anesthetize the mucosa that covers the lesion. According to Holst & Evers,[22] a two-minute application time of the topical anesthetic on the oral mucosa is adequate for best performance. For the micro-marsupialization technique, either EMLA or Dorfree was chosen. Their anesthetic effects were similar for this technique.

In all cases, it was observed the immediate extravasation of mucus while the passage of the suture and consequently reduction of the lesion in volume. This is a fundamental clinical characteristic for the diagnosis of mucus retention phenomena. If the extravasation does not occur, biopsy and histopathologic analysis are recommended.

Another feature is the passing of the suture through the interior of the lesion which, according to the literature,[5,15-17,23] causes epithelialization around the suture, establishing new excretory ducts and leading to the disappearance of the lesion. On this basis, it is suggested that the suture be passed through the widest diameter of the lesion in order to involve all the parts that compose it.

Morton & Bartley[17] reported that the suture may come loose after 2 or 3 days and in this case treatment should be repeated. In the present study, loosening of the suture in 2 patients was also observed, and a conduct of patient monitoring was adopted with a successful outcome.

Inflammation of the area was noted in all cases after the removal of the suture. According to Racey et al.,[24] silk sutures produce inflammation after 7 days. The inflammation may be due to surgical trauma and accumulation of debris around the suture. Bacterial invasion of the suture track is possible,[23] although, clinically, it was not observed in any of the 14 patients treated by the micro-marsupialization technique. Information about oral hygiene was given to the patients.

Conclusion

The micro-marsupialization technique is an alternative to be considered, especially in Pediatric Dentistry, because it is a simple procedure with a good prognosis when propery indicated.

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Abstract of the Scientific Literature

Trends in Postdoctoral Dental Education

This article cites reports and recommendations on postdoctoral dental education (PDE) in the United States conducted by various organizations from 1941 through 1995. The connecting theme of the reports is the recommendation of a mandatory period, of at least one year, of postdoctoral training, preferably with hospital experience, for all dental school graduates. PDE programs are categorized as non-specialty (i.e., hospital-based GPR or non hospital-based AEGD) or specialty programs. Statistical Tables and Figures are presented regarding: number of positions available in general dentistry and dental specialty programs; application trends; current unmet demands; and factors influencing graduates' decisions to pursue postdoctoral training.

As a complete summary of the information would be too lengthy, several key points will be highlighted:

- The total number of PDE programs has increased by ~11% since 1973 (from 672 to 747 programs).
- The number of first-year postdoctoral positions, as of 1999, stood at 2,533 of which 1,199 (47%) are specialty positions (down from a high of 1,259 in '91).
- Pediatric dentistry has reversed a declining trend from ~170 positions in the '70s to a low of 157 in '85 to 180 positions in '99.
- The overall trend to pursue PDE has risen from 18% of graduates in '80 to 35.8% in '98.
- Pediatric dentistry applicants have leveled off at ~20% of specialty applicants.
- In '98, pediatric dentistry was the second most applied to specialty (orthodontics has been first since at least '90).

Further discussion involved the reasons graduates choose to pursue PDE, the need for interest in developing more PDE programs to meet the current need, and the possibility of mandated PDE.

Comments: Although the need to develop more postdoctoral dental education programs to meet increasing demand was discussed, no mention was made of the funding sources for such programs. **RFM**

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