Histopathological Spectrum of 112 Cases of Mucocele

Denise Tostes OLIVEIRA¹
Alberto CONSOLARO¹
Francisco José Guimarães FREITAS²

¹Departamento de Patologia, Faculdade de Odontologia de Bauru,
Universidade de São Paulo, Bauru, SP, Brasil
²Escola Técnica de Saúde,
Universidade Federal de Uberlândia, Uberlândia, MG, Brasil

Mucoceles are mucous cysts related to obstruction or trauma of the minor salivary glands. The mucoceles may be lined by epithelium (mucous retention cyst) or covered by granulation tissue (extravasation cyst). This clinical and microscopic study of 112 cases of diagnosed mucoceles was carried out at the Department of Oral Pathology, School of Dentistry of São Paulo. Microscopically, the mucous extravasation cyst was the most commonly found (92.45%); however, mucous retention cysts were also observed (7.54%). Inflammatory cells mainly polymorphonuclear leukocytes and macrophages were found in the inner part of the mucocele. The minor glands involved showed degeneration and metaplasia.

Key Words: mucocele, mucous retention cyst, mucous extravasation cyst.

Introduction

Oral mucoceles represent one of the most common lesions which affect the oral mucosa. They can be found in other parts of the body, but not as frequently as in the mouth. The nomenclature used to describe mucoceles microscopically is not uniform, therefore different terminology is generally used when lesions are described in other regions of the body, such as in the paranasal sinus and the nasal cavity (Ash, 1960). Another important factor to be considered is the presence or absence of epithelial lining of the walls of the mucocele, thus determining its description and also the specific microscopic diagnosis of a similar entity. In order to verify these aspects, we proposed the study of cases catalogued in the Oral Lesion Files in our Oral Pathology Department.

Material and Methods

A total of 112 cases of mucoceles diagnosed at the Department of Oral Pathology, School of Dentistry of Bauru, University of São Paulo were studied. Details such as: age, sex, race, location of the lesion, recurrence and possible factors related to the etiology were obtained from patient records.
The microscopic aspects studied refer to the characteristics of the overlying oral mucosa, minor salivary glands involved and the mucocele itself. They were observed and registered on previously prepared charts. Normal aspects, atrophy, hyperplasia and/or ulceration were observed in the epithelium of the oral mucosa. The presence of edema, vascular congestion and/or inflammatory infiltration were also observed in the peripheral connective tissue. The microscopic characteristics of the minor salivary glands involved, which are classified as mucous or seromucous, refer to the normal or altered conditions of the acini and ducts. Therefore, cellular swelling, hydropic degeneration, ductal dilatation, metaplasia, presence of disrupted cells as well as the conditions of the glandular stroma (normal, with mucus and/or with inflammatory cells) were investigated.

The mucoceles were classified as mucous retention cysts and as extravasation cysts, respectively, with the presence or absence of the lining of epithelium. The microscopic aspect of the mucus, when present, was identified as fibrous, hyaline or mixed. The inflammatory cells present in the inner cystic cavity involved by the mucus were identified and registered, giving emphasis to the predominant cell type.

Results

Clinical data

The 112 cases of mucocele analysed were evenly distributed between sexes. Regarding race, 106 cases occurred in white patients, 4 in negroes and 1 in an Oriental. Age distribution of 108 cases is shown in Figure 1. In 4 of the cases there were no data concerning age, the same occurring in one case regarding race. Figure 2 shows the numerical and percentual location of 96 cases of mucocele in the oral cavity.
A total of 20 (18%) of the mucoceles had reappeared and the previous trauma was still present in 10 of the cases (9%).

In all cases the clinical aspects of the lesions were nodules or papules of a whitish-pink or blueish color. The size varied from 0.2 to 2 cm in diameter. Only 2 of the cases presented multiple lesions, these being two mucoceles. The duration of the lesions varied from 4 days to 7 years, with an average duration of 14 months. The symptomatology was described in only 4 cases and consisted of pain associated with traumatism of the area. In one case, there was local hemorrhage.

The presence of remissions was detected in 21 cases and the period of their occurrence varied from 1 to 7 months.

Microscopic data

The alterations found in the oral mucosa overlying the lesion, as well as the peripheral connective tissue are shown in Table 1.

In the minor salivary glands involved, various aspects of the acinar and duct structures were observed and the alterations encountered are shown in Figures 3 and 4, respectively. Analysis of the stroma of the 75 glands involved showed that 28 (73%) were
Table 1 - Distribution of epithelial alterations of the oral mucosa and of the peripheral connective tissue in 112 cases of mucoceles.

<table>
<thead>
<tr>
<th>Epithelium of the oral mucosa</th>
<th>N</th>
<th>%</th>
<th>Peripheral connective tissue</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>4</td>
<td>4.54</td>
<td>Normal</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Atrophic</td>
<td>61</td>
<td>69.31</td>
<td>Inflamed</td>
<td>14</td>
<td>15.90</td>
</tr>
<tr>
<td>Hyperplastic</td>
<td>75</td>
<td>85.22</td>
<td>Vascular congestion</td>
<td>57</td>
<td>64.77</td>
</tr>
<tr>
<td>Ulcerated</td>
<td>10</td>
<td>11.36</td>
<td>Edema</td>
<td>65</td>
<td>73.86</td>
</tr>
</tbody>
</table>

infiltrated with chronic inflammatory cells, predominantly lymphocytes, and in 53 (70.6%) of the glands, the stroma presented mucus discharge in the interior, and, in 12 cases (16%), normal structures were observed.

The mucocele itself, in 92.45% of the cases, was filled by mucus surrounded peripherally by a rim, generally, regular, of granulated tissue, which presented a wide range of fibrosis, fibroblastic proliferation and cell infiltration. For this reason, these cases were diagnosed as mucous extravasation cysts. However, 7.54% of the mucoceles presented an epithelial lining, 2 cases having one layer and 3 cases cuboid or cylindrical in shape. In 3 cases, the epithelium was evenly stratified; in one of them there were superficial cuboid

![Figure 3](image-url) - Acinar alterations found in the minor salivary glands involved in the pathogenesis of 75 cases of oral mucoceles.
cells. Due to this, 8 cases were diagnosed as mucous retention cysts. In 8 other cases, we were not able to do a mucocoele analysis due to excessive fragmentation and absence of its main characteristics.

Mucous content was present in 102 cases, 56 (54.9%) being of fibrillary aspect, 29 (28.43%) of hyaline and homogeneous aspect, and 17 (16.66%) of the cases, both types were present. In the mucous content there was the occurrence of cells in 96 out of 102 cases, which were predominantly macrophages and neutrophils. In 12 cases, the presence of eosinophils was significant (Figure 5).

**Discussion**

Mucocoeles are characterized by an accumulation of mucus in the interior of connective tissue, known as mucus extravasation cyst; which in general, represent most of the cases. In the present study 92.45% of the cases presented such characteristics when analyzed microscopically. Epithelial lining of the mucus occurred in very few cases; of 104 cases studied only 8 (7.54%) were diagnosed as mucus retention cysts. Such prevalence is similar to that detected by other authors (Sela and Ulmansky, 1969; Southam, 1974; Marin et al., 1984).

This distinguishing terminology of the mucocoele should be considered, especially in the interpretation of pathoanatomical findings. Mucocoeles occur in other body regions; however, the microscopical characterization may be different, such as in the paranasal sinus.
and the nasal cavity (Ash, 1960). The real frequency of the oral mucocele is almost impossible to determine, due to the fact that many of them recede spontaneously. Besides, many of these excised lesions, unfortunately, are not sent to pathological laboratories (Shear, 1983). The age distribution for oral mucoceles reveals a greater prevalence (45%) in the second decade of life, differing from the data of Shear (1983) and Valle and Oliveira (1972) in which the third decade was considered more prevalent. Independently, it occurs at any age; however, Harrison (1975) pointed out that in age groups over 40 years, there is a greater proportion of mucoceles of the mucous retention cyst type. In our 8 cases of mucous retention cysts, 4 occurred in individuals over this age.

In the literature as well as in our 112 cases, sex distribution is equal. However, there is great predominance in the white race. In our survey, our attention was called by the fact that 95.4% of the cases occurred in white patients, even though in Brazil there is a high proportion of negroes. The predominance as to race was also detected by Standish and Shafer (1959) and by Robinson and Hjorting-Hansen (1964); therefore, this aspect should be studied with more exact epidemiological criteria.

The predominant location was the lower lip (52.25%), followed by the tongue (14.4%) and upper lip (6.3%), which, except for some small variation, is compatible with data found by other authors (Chaudry et al., 1960; Valle and Oliveira, 1972; Shear, 1983).

Clinical presentation corresponds invariably to that described up to now in the literature (Valle and Oliveira, 1972; Shear, 1983; Marin et al., 1984; Sanatana Garay and Miranda Tarrago, 1984). One of the findings which called our attention was the duration of the lesion, which varied from 4 days to 7 years. The long lasting cases probably correspond to those in which constant trauma and the accumulation of mucus did not lead to the
destruction of the glandular parenchyma, which probably occurred in the cases of spontaneous regression. The autoresolution of the mucoceles may be related to the degeneration and breakdown of the acini due to enzymatic digestion, not only because of the action of polymorphonuclear cells and macrophages but due to the accumulated salivary secretion as well.

Also, from the clinical point of view, the rate of recurrence found was considerably high (18%); especially if compared with the casuistics of Elzay et al. (1968) where a recurrence rate of 9% was reported. Certainly, this occurred as a result of surgical technical errors, such as the improper removal of the minor salivary glands during the excision of the mucocele. Therefore, these cases would not be a case of recurrence but new lesions in the same location.

The percentage of acini with hydropic degeneration (86.66%), with cloudy swelling (69.33%) and disrupted cells (48%), generally accompanied by mucous extravasation in the connective tissue, reinforces the hypothesis that the mucoceles represent a disrupted mucous retention cyst. The cellular degeneration, the rupture and the acinar metaplasia may be consequences of mucous retention in the ducts with reflux of this mucous secretion into the interior of the glandular parenchyma. The acini would then be under a physical action from the extra pressure, as well as chemical or enzymatic action from the constituents of the accumulated mucous. Although, only experimentally, Bhaskar et al. (1956) found results similar to ours, as did other authors (Chaudry et al., 1960). Thus, we should further consider the possibility of this reflux occurring right from the beginning; as suggested by Praetorius and Hammersstrom (1974) though probably, in these cases, reflux could be less in the lesion even in those mucoceles characterized by ductal disruption.

Ductal alterations found in the salivary glands involved reinforce the former reasoning. In 88.15% of the cases they were dilated, in 81.57%, metaplastic, and in 36.84%, they were disrupted. A total of 61.84% of the ductal lumen presented a shapeless substance, as a result of the accumulation of mucus in stasis, in reflux. The ductal alterations described were also observed in various papers concerning mucoceles (Chaudry et al., 1960; Sampaio, 1972). The glandular stroma was infiltrated with mucus in the majority of cases, probably as a result of the acinar and ductal disruptions. This disruption has occasionally been observed in some microscopic findings.

The occurrence of only 8 cases of epithelium-lined mucocele is explained as the result of little elasticity of the ductal structures to contain an exaggerated accumulation of secretion. In older patients, probably the smaller production, along with less salivary flow, would explain the greater prevalence of the mucous retention cyst in the age group over 40 years, as occurred in 50% of our cases and in 85% of the cases of Harrison (1975), and 67% of those of Shear (1983). To reinforce this reasoning, we can use the results obtained by Jensen et al. (1979), in which the occurrence of calculi in minor salivary glands was detected in individuals over the 5th decade. In patients in this age group, calculi in the minor salivary glands may represent the principal cause of mucoceles.

The accumulated mucus in the mucous extravasation cyst was invariably surrounded by granulation tissue. It had a predominantly fibrillar aspect, when not hyalinized
or mixed. These varied aspects are the result of various factors such as, duration of the accumulation, exposition of the same during macroscopy of the sample and its histotechnical processing, and the unequal distribution of the same in the cavity due to surgical procedures, such as perforations, tweezing and incisions. Normally, the mucus contains cells; in 88.65% of the cases, there were normal or vacuolated macrophages, besides those intensely filled with mucin; in 62.8% there were neutrophils and in 12.67% eosinophils. According to Harrison (1975), the mucus extravasation induces an intense macrophage and fibroblast reaction, especially in the first days of the acinar or ductal rupture, thus, justifying not only the peripheral tissue reaction but also the cellular content of the mucus.

References

Valle JC, Oliveira LY: Mucus retention cysts review of 50 cases. Arq Cent Estud Fac Odontol (Belo Horizonte) 9: 201-206, 1972

Correspondence: Profa. Denise Tostes Oliveira, Departamento de Patologia, Faculdade de Odontologia de Bauru, Al. Otávio Pinheiro Brisola, 9-75, 17043-101, Bauru, SP, Brasil.

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