Dermoscopy of oral mucocele: three type of extravasation mucocele

Abstract

Background/aim: Dermoscopy is a diagnostic tool that assists in imaging the epidermis and dermis. Although it has also been started to be used to diagnose non-melanocytic lesions recently, it has not been tested much on oral mucosal masses such as oral mucoceles. This study aimed to investigate whether dermoscopy is a valuable tool in diagnosing oral mucoceles.

Materials and methods: In this study, the clinical and dermoscopic features of 21 oral mucocele lesions of 21 patients (11 females, 10 males) aged between 6 and 38 years who were confirmed histopathologically were evaluated.

Results: 95.2% (20) of the lesions were extravasation and 4.8% (1) were retention mucoceles. The non-vascular structures were determined as white areas (61.9%, 13), erythema (57.1%, 12), purplish-gray background (52.3%, 11), ulcer (30%, 8), yellowish-orange areas (23.8%, 5), crust (14.2%, 3), starburst pattern (0.95%, 2), bleeding (0.47%, 1). Dermoscopically, forty percent of extravasation mucoceles were classified as type 1 (8 patients), 25% as type 2 (5 patients) and 35% as type 3 (7 patients).

Conclusion: We concluded that there are three types of extravasation mucocele dermoscopically and clinically and these types may be stages of transition between each other.

Keywords: Mucocele, cyst, neoplasms, dermoscopy
1. Introduction

Oral mucocele is the most frequently observed benign lesion of the minor salivary gland that is formed as a result of any mechanical trauma on the discharge duct of the salivary gland. There are two types of mucoceles as extravasation mucocele (EM) and retention mucocele (RM) [1,2]. Extravasation mucocele emerges as a result of the extravasation of salivary gland secretions from the salivary gland duct into the soft tissues around the gland. Meanwhile, the obstruction of the salivary gland ducts which leads to the reduction or absence of glandular secretion causes RM [3,4]. These are accepted as separate of each other since each has a unique pathogenesis and microscopic properties [5]. While the lesions are more common in the internal part of the lower lip, they may also be present on the buccal mucosa, tongue and floor of the mouth [6-8].

Meanwhile, dermoscopy is a diagnostic tool that is used for both melanocytic and non-melanocytic lesions. Although it is generally used to diagnose melanocytic skin diseases, it has also been started to be used to diagnose non-melanocytic skin diseases also in the recent years [9]. There are very few dermoscopic publications concerning oral mucosal diseases [10, 11]. This study is aimed to investigate the dermoscopic and clinical characteristics of histopathologically verified mucoceles.

2. Materials and Methods

Ethical committee decision was obtained for the study. 21 patients (11 female, 10 male) of various ages in the range of 6-38 ages (mean age 20.38), who have applied at the dermatology department as out-patients and received mucocele diagnosis histopathologically, were included in the study. The lesions were totally excised by the
otorhinolaryngologist after dermoscopic evaluation. This study covers three stages that include the dermatological and dermoscopic examination of the lesions (Dermatoscope Delta 20; Heine, Herrsching, Germany; Handyscope Fotofinder Systems), photographing and evaluating the findings. All lesions in the study were photographed macroscopically (at least 3) and by the hand dermatoscope (at least 10) and the data were recorded. The structures that were classified as vascular and non-vascular were identified dermoscopically. The contact plate was washed with physiological saline prior to taking the dermoscopic images in order to increase the image quality and the visibility of the structures. The pressure on the lesion was relieved in order to prevent the vascular structures from collapsing.

Scoring for connective tissue increase, inflammation, vascular proliferation (0: absent, 1: mild, 2: moderate, 3: severe) was performed. Epithelial thickness and mucus spread were measured microscopically. The amount of mucin was evaluated by two pathologists by calculating the area at 40x magnification. Furthermore, the base and surface characteristics of the lesions were evaluated.

All patient data were uploaded to SPSS 17.0 for Windows statistic application software (SPSS Inc., Chicago, IL). Mann-Whitney U test and Pearson's Chi-square test was used to compare the parameters. P-value of < 0.05 was accepted as indicating statistical significance.
3. Results

21 lesions of 21 patients, the diagnoses of which were verified histopathologically, were included in the study. 52.4% (11) of the patients were female and 47.6% (10) were male. The average of all the patients, whose ages varied in the range of 6-38 ages, was 20.38±9.07. 95.2% (20) of the lesions were extravasation and 4.8% (1) were retention mucoceles. All lesions were localized on the lower lip mucosa. The starting time of the lesions varied between 1 week and 12 months. The lesion diameters varied in the range of 4-15 mm and the average diameter was 7.47 mm (±2.96). The non-vascular structures were determined as white areas (61.9%, 13), erythema (57.1%, 12), purplish-gray background (52.3%, 11), ulcer (30%, 8), yellowish-orange areas (23.8%, 5), crust (14.2%, 3), starburst pattern (0.95%, 2), bleeding (0.47%, 1). Meanwhile, the vascular structures were compiled as hairpin-like vessels (57.1%, 12), branching vessels (42.8%, 9), dot vessels (33.3%, 7), comma-like vessels (0.47%, 1). The lesions were erythematous (57.1%, 12) or purplish-gray background (52.3%, 11) as based on their general colors. Meanwhile, two lesions were both erythematous and purplish-gray background. While 47.6% (10) of the lesions were nodule and 52.3% (11) were dome-shaped, as based on their base properties, 85.7% (18) had a smooth surface and 14.2% (3) had a lobular surface as based on their surface properties. Extravasation mucoceles were basically divided into three types as based on their clinical dermoscopic characteristics such as color, base, surface and dermoscopic characteristics such as vascular and non-vascular structures. The lesions in type 1 (Figure 1) were purplish-gray background, soft, nodular, with smooth surfaces, regular and uncertain border and
were dermoscopically accompanied by reticular branching vessels. The lesions in type 2 (Figure 2) were erythematous, soft, nodular, with smooth surfaces, regular and uncertain border and were dermoscopically accompanied by hairpin-like vessels. Meanwhile, the lesions in type 3 (Figure 3) were erythematous, firm, dome-shaped, with sharp and irregular border, and with smooth surfaces (rarely lobular surfaces) and were dermoscopically accompanied by hairpin-like vessels. It has been observed that the clinical characteristics in type 2 resembled type 1, while the dermoscopic characteristics were more similar to type 3. In addition, while the mucin material was drained by puncture in types 1 and 2, there was no mucin material drainage in type 3.

The mean age of patients with type 1 (23.5) and type 2 (25) lesions was higher than that of patients with type 3 (12.57) lesions (p=0.016). A significant relationship could not be identified between the lesion diameters and types. The purplish-gray background and reticular branching vessels observed in type 1 lesions were statistically significant compared to other types (respectively; p=0.001, p=0.002). In type 2 and 3, the detection of erythema and hairpin-like vessels were significant according to type 1(respectively; p=0.002, p=0.008). Yellowish-orange areas observed in type 3 were statistically significant compared to other types (p=0.036). Any significant relationship could not be determined between the white areas and three clinical types. However, they were identified more in types 2 and 3.

It was statistically significant to observe more mucin material amount in EM types 1 and 2 as compared to type 3 histopathologically, even after there has been a certain amount of material lost by puncture (p=0.023, Table 1). A significant relationship related with epithelium thickness, vascular proliferation, increased connective tissue and
inflammation could not be determined between the types (Figure 4). However, the
epithelium thickness was less in retention mucoceles as compared to EM.
While 5 of the patients related with all lesions expressed a trauma history, 6 patients
said that they had no trauma and 10 said that they did not know how the lesions started.
The clinical, histopathological and dermoscopic features of EM types are shown in
Table 1-2.

4. Discussion

Oral mucocele is a widespread salivary gland lesion arising from mucus accumulation.
It is observed most frequently on the lower lips since the lower lip is more prone to
trauma due to its anatomic localization [12]. A mucocele is clinically observed as
asymptomatic vesicles and pink or bluish colored bulla and the dimensions vary from 1
mm to several centimeters [13]. It has the highest incidence between ages 10 and 20
[14]. Two types of mucoceles may appear as extravasation and retention types [12].
EM is widespread in children while RM is very rare.

A retention mucocele emerges from the obstruction of the salivary duct by a sialolith or
a scar in the duct; and the mucin is therefore surrounded by ductal epithelium. While
RM is associated with the traumatic injury of the ductus, EM emerges from the
extravasation of the saliva to the adjacent connective tissue areas [14].
Extravasation mucoceles undergo three evolution phases. The mucus infiltrates into the connective tissues from the mucus discharge duct in the first phase. In the next stage, in other words the resorption phase, granuloma formation occurs due to foreign substance reaction. In the final stage, a pseudo-capsule forms around the mucosa (without epithelial lining) [3, 4].

Dermoscopy is a valuable diagnostic tool for both melanocytic and non-melanocytic lesions. To the best of our knowledge, dermoscopic profiles for oral mucocele lesions have not been previously reported in the English literature.

In our study, 95.2% of the subjects (20 patients) were observed to have EM. Only one subject was RM. The publications regarding the incidence of mucocele between genders are controversial [15]. According to one study, incidence between men and women was not observed to be significant different [16]. In our study, 52.4% (11) of the patients were female and 47.6% (10) were male. There was no significant difference between the females and males.

Oral mucocele of the minor salivary gland is generally observed in young people. The peak age of this mucocele has been reported as 10-20 years. According to Liu et al., 43.7% of the total patients were 10-20 years of age and 37.5% of patients were under 10 years of age. [4]. Children under 15 years of age were calculated as 62.5%. In our study, the ages of the patients varied in the range of 6-38. The average age was 20.38 ±09.07. However, while 47.6% (10) of our subjects were 20-30 years of age, 19% (4) of the patients were in the 10-20 age range.
Diagnosis is principally based on clinical findings. Appearance of mucoceles is pathognomonic and the location of the lesion, trauma history, rapid formation, changes in dimensions, bluish color and texture are important factors that need to be taken into consideration prior to the final diagnosis [17]. Extravasation type is more widespread. This type may be misdiagnosed as traumatic fibroma when it does not have a soft texture and bluish color [1,2,18]. The displacement of the epithelium by fibrinopurulent membrane with dense chronic inflammatory cells may cause the surface of the lesion to appear yellowish [18]. According to the literature, classical mucoceles are known as bluish and soft [1,2,18]. Without this color and consistency, it is reported that it may be misdiagnosed [18]. In our study, bluish / purplish color was not observed in 60% of EMs (type 2 and 3), and soft consistency was not observed in 25% (type 3). We classified mucoceles that were evaluated as soft and bluish as Type 1, and those with different clinical and dermoscopic appearances as type 2 and type 3. Type 1 mucocele had purplish color, reticuloporous branching vessels and material drainage by puncture. In type 2, erythema, hyperkeratotic white areas and unclear hairpin vessels and puncture material drainage were observed. Type 3 showed erythema, yellow areas and marked hairpin vessels. There was no material drainage by puncture.

Even if they are children or adults that it can be understood from the anamnestic of most people, especially type 3 lesions began purplish and then the lesions grow and become habitually bitten, which occur white color by creating hyperkeratosis like these type 2 lesions and eventually turns into irregular and sharp confined lesions like type 3.

With these different clinical and dermoscopic features, we think that EMs begin as type 1, known as the classical type, and then evolve into type 2 with white areas in the form
of hyperkeratosis with recurrent trauma, and then evolved into type 3 with yellow color, a sign of the chronic appearance mentioned in the literature.

The lesions in type 1 were soft, nodular, purplish-gray color and had uncertain and regular borders, the lesions in type 2 were soft, nodular, erythematous and had uncertain and regular borders, while the lesions in type 3 were firm, dome-shaped, erythematous and had sharp and irregular borders. Furthermore, mucin material could be drained by puncture in type 1 and type 2.

The appearance of both EM and RM are similar clinically. Mucoceles are found as bluish, soft and transparent cystic tumescenses that frequently dissolve spontaneously. Blue color is associated with vascular congestion, cyanosis of the tissue at the top and accumulation of fluid beneath. However, coloring may change depending on the size of the lesion, its closeness to the surface and the flexibility of the tissue at the top [12]. The purplish-gray color observed in type 1 was associated with the excessive amount of mucoid material as based on the pathological evaluations. Although epithelium thickness was increased in all types of EM, this thickness was less in RM as compared to EM.

The term oral exophytic lesion is defined as pathological growth that bulges above the normal contours of the oral mucosa [19]. There are many basic mechanisms responsible for oral exophytic lesions such as hypertrophy, hyperplasia, neoplasia and pooling of the fluid [20]. This complicates approaching these lesions clinically [21,22]. According to the national epidemiological study of Zain et al., 26% of all lesions are exophytic lesions [21]. Exophytic lesions can be classified according to their surface texture (rough and smooth), base type (nodular, dome-shaped, sessile and pedunculated), and
consistency (firm, soft, cheesy, rubbery, and bony hard) [20,22,23]. While 47.6% (10) of the lesions are nodule-shaped and 52.3% (11) are dome-shaped as based on their base characteristics, 85.7% (18) have smooth and 14.2% (3) have lobular surfaces as based on their surface characteristics. 75% (6) of the lesions were nodular in EM Type 1, 60% (3) of the lesions were nodular in type 2, and 85.7% (6) of the lesions were dome shaped in type 3. When they were examined as based on surface characteristics, all of types 1 and 2 were smooth, while 57.1% (4) were smooth and 42.9% (3) were lobular in type 3.

In conclusion, this study is the first dermoscopic study carried out as aimed for the masses in the oral mucosa. Three clinical forms of the EM were identified from the clinical and dermoscopic perspective. Purplish-gray background and reticular branching vessels were identified in type 1, erythematous base and hairpin vessels were identified in type 2, while hairpin vessels on erythematous base and yellowish-orange areas were identified in type 3. It is believed that these types are stages of transition from type 1 to type 3.

References


Table 1. General clinic and histopathological features of extravasation mucocele.

<table>
<thead>
<tr>
<th>Clinic and histopathological features of extravasation mucocele</th>
<th>Type 1 (n=8)</th>
<th>Type 2 (n=5)</th>
<th>Type 3 (n=7)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (female/male)</td>
<td>4/4</td>
<td>2/3</td>
<td>5/2</td>
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<tr>
<td>Mean age of patients (years)</td>
<td>23.5</td>
<td>25</td>
<td>12.57</td>
<td>0,016</td>
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<tr>
<td>Number of patients (n/%)</td>
<td>8/40</td>
<td>5/25</td>
<td>7/35</td>
<td>0,239</td>
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<tr>
<td>Duration of lesions (month)</td>
<td>8.8</td>
<td>5.2</td>
<td>6.5</td>
<td>0,225</td>
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<tr>
<td>Puncture and mucin drainage</td>
<td>Yes (8/8)</td>
<td>Yes (5/5)</td>
<td>No (0/7)</td>
<td>0,000</td>
</tr>
<tr>
<td>Smooth surface</td>
<td>7/8</td>
<td>5/5</td>
<td>5/7</td>
<td>0,380</td>
</tr>
<tr>
<td>Base</td>
<td>Nodular (3/8)</td>
<td>Nodular (2/5)</td>
<td>Dome-shaped (5/7)</td>
<td>0,371</td>
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<tr>
<td>Border of lesions</td>
<td>Regular and unclear (8/8)</td>
<td>Regular and unclear (5/5)</td>
<td>Irregular and sharply (7/7)</td>
<td>0,000</td>
</tr>
<tr>
<td>Consistency of lesions</td>
<td>Soft (8/8)</td>
<td>Soft (5/5)</td>
<td>Firm (7/7)</td>
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<td>Histopathological feature</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Amount of mucin (mean/mm²)</td>
<td>0.312 mm²</td>
<td>0.287 mm²</td>
<td>0.135 mm²</td>
<td>0.023</td>
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</table>
Table 2. Dermoscopic features of extravasation mucocele.

<table>
<thead>
<tr>
<th>Dermoscopic structures</th>
<th>Type 1 (n=8)</th>
<th>Type 2 (n=5)</th>
<th>Type 3 (n=7)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purplish-gray background</td>
<td>8/8</td>
<td>1/5</td>
<td>1/7</td>
<td>0.001</td>
</tr>
<tr>
<td>Erythematous background</td>
<td>1/8</td>
<td>5/5</td>
<td>6/7</td>
<td>0.002</td>
</tr>
<tr>
<td>Branched vessels (reticular)</td>
<td>7/8</td>
<td>0/5</td>
<td>1/7</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>1/8</td>
<td>4/5</td>
<td>6/7</td>
<td>0,008</td>
</tr>
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<td>------------------------</td>
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<td>-----</td>
<td>-----</td>
<td>-------</td>
</tr>
<tr>
<td>Hairpin-like vessels</td>
<td>1/8</td>
<td>0/5</td>
<td>4/7</td>
<td>0,036</td>
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<tr>
<td>Yellowish-orange areas</td>
<td>1/8</td>
<td>4/5</td>
<td>5/7</td>
<td>0,493</td>
</tr>
<tr>
<td>White areas</td>
<td>4/8</td>
<td>5/5</td>
<td>1/7</td>
<td>0,002</td>
</tr>
<tr>
<td>Dot vessels</td>
<td>1/8</td>
<td>0/5</td>
<td>0/7</td>
<td>0,454</td>
</tr>
<tr>
<td>Comma-like vessels</td>
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<td>2/5</td>
<td>5/7</td>
<td>0,067</td>
</tr>
<tr>
<td>Ulceration</td>
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<td>2/5</td>
<td>0/7</td>
<td>0,036</td>
</tr>
<tr>
<td>Crust</td>
<td>1/8</td>
<td>0/5</td>
<td>0/7</td>
<td>0,454</td>
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</table>

**Figure 1.** Extravasation mucocele type 1 lesions. Dermoscopy shows a purplish-gray background (a, c, e), reticularly branching vessels (a, c, e), yellowish-orange area (a) and white area (c). Macroscopic pictures (b, d, f) of these patients have nodular appearance.
Figure 2. Extravasation mucocele type 2 lesions. In dermoscopy, the hairpin-shaped vessels (a, c, e) surrounding the white area (a) in the starburst style and white areas (e, c) on the erythematous background extend into the center. In macroscopic pictures, there are nodular lesions (b, d, f) with white surface.
Figure 3. Extravasation mucocele type 3 lesions. Dermoscopically, white areas (a, c, e), yellowish-orange areas (a, c, e) and hairpin-shaped vessels (a, c, e) on the erythematous ground in all lesions show orientation towards the center. In macroscopic pictures (b, d) of image a and c, dome-shaped lesions are seen sharp and irregular border. There is not macroscopic picture of image e.
Figure 4. (a). Type 1. Irregular acanthotic stratified squamous epithelium, scattered minimal mucoid accumulation in the epithelial tissue, moderately mixed type inflammation and proliferation in vascular structures (H & E, x100). (b). Type 2. Focal area of mucoid material in a scattered manner, mild to moderate inflammation and proliferation in vascular structures (H & E, x100). (c). Type 3. Stratified squamous
epithelium, separation in sub-epithelial tissue, mild type inflammation, vascular proliferation and mucoid material in heterogeneous distribution (H & E, x100).
Figure legends

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**Figure 3.** Extravasation mucocele type 3 lesions. Dermoscopically, white areas (a, c, e), yellowish-orange areas (a, c, e) and hairpin-shaped vessels (a, c, e) on the erythematous ground in all lesions show orientation towards the center. In macroscopic pictures (b, d) of image a and c, dome-shaped lesions are seen sharp and irregular border. There is not macroscopic picture of image e.

**Figure 4.** (a). Type 1. Irregular acanthotic stratified squamous epithelium, scattered minimal mucoid accumulation in the epithelial tissue, moderately mixed type inflammation and proliferation in vascular structures (H & E, x100). (b). Type 2. Focal area of mucoid material in a scattered manner, mild to moderate inflammation and proliferation in vascular structures (H & E, x100). (c). Type 3. Stratified squamous
epithelium, separation in sub-epithelial tissue, mild type inflammation, vascular proliferation and mucoid material in heterogeneous distribution (H & E, x100).

Table legends

Table 1. General clinic and histopathological features of extravasation mucocele.
Table 2. Dermoscopic features of extravasation mucocele.