Surgical Management of Mucocele of The Lower Lip: Case Report and Literature Review

Ericko Ichi[*], Dwi Riski Saputra,**, Luh Dewi Rahayu[***]*

[*]Oral and Maxillofacial Surgery Department, Faculty of Dental Medicine, Jember University
[**]Resident, Oral and Maxillofacial Surgery Department, Faculty of Dental Medicine, Airlangga University
[***]Pathology Anatomy Department, RSD Mangusada Kabupaten Badung, Bali, Indonesia

***Correspondence*: ericko_ichi@yahoo.co.id**

Received 20 January 2024; 1st revision 29 February 2024; 2st revision 15 November 2024; Accepted 31 December 2024; Published online 31 December 2024

Keywords:

Cyst, excision, management, mucocele

ABSTRACT

Background: *Surgery for mucocele cases in daily practice is still a challenge. Mucocele is a lumpy lesion in the oral cavity that can interfere with the patient's comfortable speaking and chewing process. A mucocele is a lump in the oral cavity due to rupture of the minor salivary glands due to trauma or obstruction of the minor salivary glands. The prevalence of mucocele is 2.4 cases out of 1000 people, and it often occurs at a young age. This paper aims to describe and report mucocele management with simple surgery.*
Case: *A 20-year-old patient was reported to have a mucocele in the left inferior labial region. The lump has been there for two months and is slowly getting bigger. The lump is painless and very annoying when talking and chewing.*
Conclusion: *Dentists can perform mucocele management with correct diagnosis and simple surgical procedures with minimal equipment to ensure better treatment outcomes.*

doi: http://dx.doi.org/10.30659/odj.11.2.331-337
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How to Cite: *Ichii et al*. Surgical Management of Mucocele of The Lower Lip: Case Report and Literature Review. Odonto: Dental Journal, v.11, n.2, p. 331-337, December 2024.

INTRODUCTION

Lumps on the lips can cause anxiety and discomfort for the patient, especially when talking and chewing. Large lumps on the lips are also very aesthetically disturbing. A mucocele is a lump often on the lower lip and cheek mucosa. Mucocele can occur due to traumatic mechanisms and obstruction of minor salivary gland ducts, which causes saliva extravasation into the surrounding tissue.[1] In the clinical picture, mucoceles manifest as soft, smooth, painless nodules, varying in color from bluish to pink like the color of the surrounding tissue. Superficial mucoceles are bluish to transparent, while deeper lesions are reddish pink, similar to the color of the mucosa. The size of mucoceles varies between 1 mm to several centimeters.[23] The location of this mucocele can occur throughout the oral cavity, such as the buccal mucosa, floor of the mouth, palate, and tongue. The most common causes of mucoceles are mechanical trauma (biting) or chronic irritation (from smoking or heat). The minor salivary glands most often affected (up to 80%) are the mucosa of the lower lip due to frequent biting. Mucoceles can remain without change if treatment is not carried out[2].

Microscopically, mucoceles have two types: extravasation and retention. Extravasation mucocele, also called pseudocyst, occurs due to trauma, such as the mucosa being bitten, while retention mucocele is caused by obstruction of the minor salivary glands. The prevalence of mucocele out of 1000 people is 2.4 cases with the highest percentage (70%) occurring at the age of 3-20 years[2]. Extravasation mucoceles have a prevalence in individuals under 30 years of age with more than 80% of all mucocele cases, while retention mucoceles have a lower incidence of around 20% of all cases and often occur in older patients[4]. Mucocele can occur in both men and women. The differential diagnosis of mucocele includes fibrous hyperplasia, lipoma, fibroma, oral lymphangioma, herpes, oral pyogenic granuloma, mucous membrane pemphigoid, and bullous lichen planus[5,6]. Several management approaches are based on medical literature, such as surgical excision with a scalpel, carbon dioxide ablation, laser excision, marsupialization, and cryosurgery[7].

This case report aims to present the management and clinical considerations to increase the knowledge of general dentists through a simple surgical excision approach and removal of the involved accessory salivary glands. Excision is an option for small to medium-sized mucoceles[8].

CASE REPORT

A 20-year-old man came to the Bali Provincial General Hospital in good general condition, complaining that there was a lump on the inferior labial two months ago. At first, it was small and then enlarged to the size of 1 cm x 0.7 cm as it is now. Previously, the patient complained that he had been bitten several times in this area. The lump is not painful, and it isn't very pleasant when talking and chewing. The lump never bursts or shrinks on its own. The patient has never experienced this. The patient also went to the nearest health center and was given treatment in the form of antibiotics and painkillers, but there was no improvement at all. There has been no significant weight loss over the past two months and no lumps in other body areas. Systemic disease and allergies were declined. Vital signs were within normal limits (**Figure 1**).

Figure 1. A lump appears on the inferior labialis with a diameter of 1 cm.

On extra-oral clinical examination, there was no facial asymmetry, no edema or hyperemia. The submandibular, parotid, and sublingual glands were within normal limits. Intraoral inspection revealed a lump on the left inferior labial, clearly defined; the surface appeared flat and smooth, measuring 1 cm x 0.7 cm, and translucent. On palpation examination, a lump was palpable in the mucosa of the left inferior labial region, measuring 1 cm x 0.7 cm, resembling a dome, painless, non-throbbing, and non-fluctuating.

Based on the results of the clinical examination and patient history, the diagnosis of this patient was a mucous extravasation cyst or mucocele. The action plan is surgical cyst excision and suturing of the scar under local anesthesia.

The operation begins with intra-oral asepsis using 10% Povidone Iodine and extra-oral asepsis using 70% alcohol, and then a sterile drape is applied. Local anesthesia uses 2% lidocaine combined with epinephrine 1:100,000 injected using a local infiltration technique in the area around the mucocele lesion. The surgical stage begins by making an incision limited to the mucosal epithelium in a vertical direction (perpendicular to the orbicularis oris muscle) using blade no.15, starting from the top of the lesion to the outer border of the lesion. After the incision is made, blunt dissection is performed until the lesion borders are identified. Then, use a bent clamp to separate the base of the lesion from the orbicularis oris muscle, and on the lateral side using metzenbaum. The removal is done slowly, so as not to tear the cyst wall, followed by removing the remaining lumps until the surgical area is free from the remaining cyst lesions. Post-excision evaluation showed labial tissue without remaining cyst epithelium. Then, irrigation was carried out with sterile 0.9% NaCl. The surgical wound was closed with a simple interrupted suture of three silk threads. (**Figure 2**).

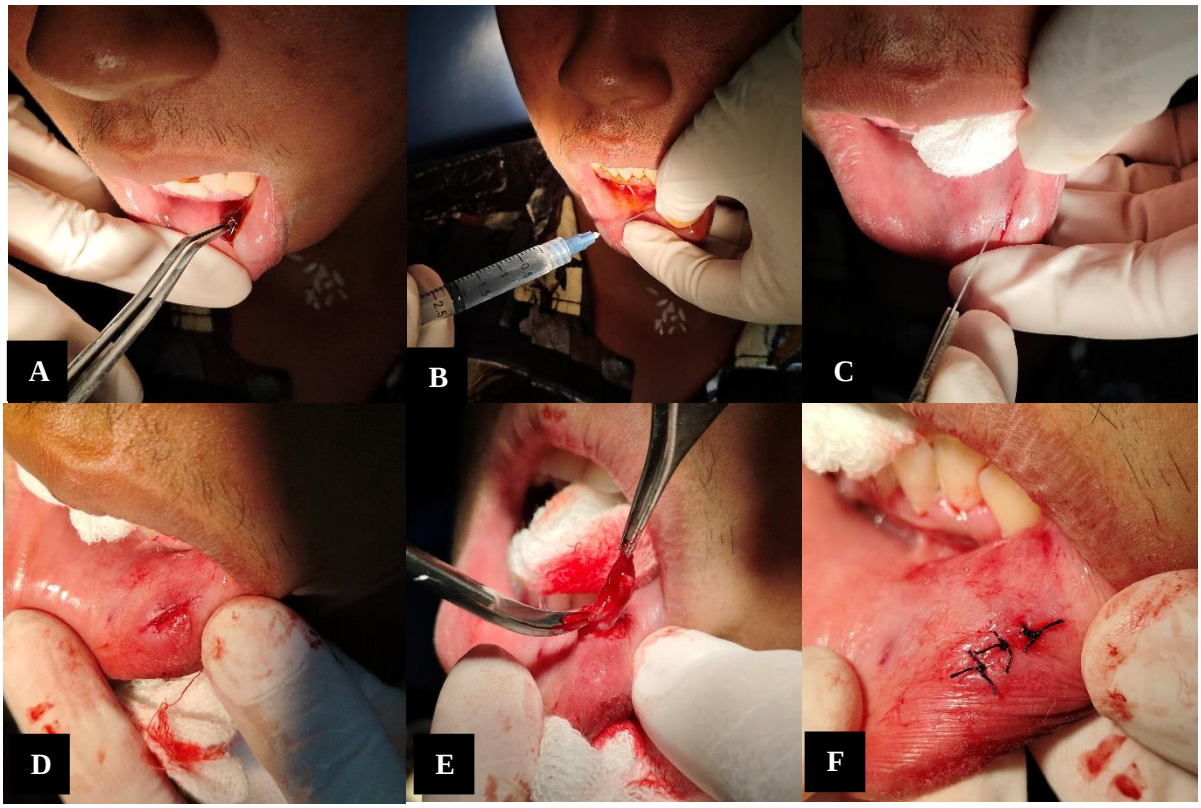

Figure 2. A. Asepsis of the working area. **B.** Local anesthesia with vasoconstrictor. **C.** Make a vertical incision from the highest peak of the lump. **D.** Gently remove the cyst. **E.** Evaluation of the work area, irrigation, and curettage. **F.** Immediate post-operatively, simple interrupted sutures are visible.

After surgery, antibiotics and analgesics were prescribed. Periodic one-day, one-week, and long-term follow-up examinations are performed. Then, the tissue is sent to the anatomical histopathology laboratory for examination (**Figure 3**).

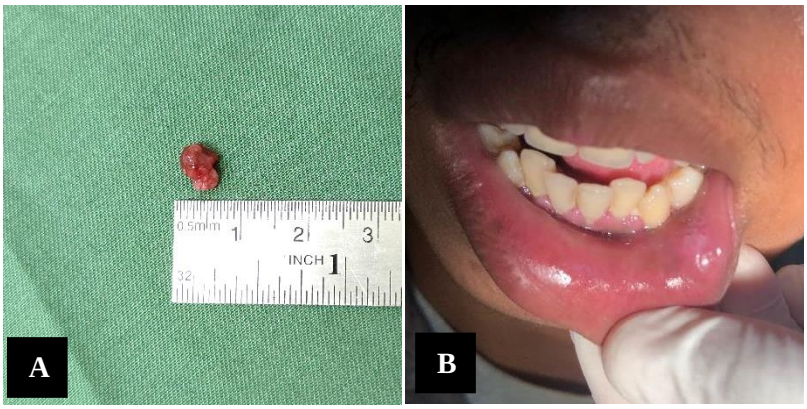

Figure 3. A. Cyst specimen measuring approximately 0.7 x 0.5 x 0.5 cm. **B.** 1 week after surgery, the post-operative wound appears to have closed well, and the color is the same as the surrounding tissue.

On histopathological examination, **Figures 4 A, B,** and **C** show polypoid tissue lined with a squamous surface epithelium without signs of atypia. In the stroma, cyst formation appears without lining epithelium. The cyst wall consist of granulation tissue containing neutrophils and lymphoplasmacytic inflammatory cells. The lumen of the cyst contains residual mucinous material with

light distribution of inflammatory cells such as neutrophil, lymphoplasmacytic, and eosinophils. In the nearby stroma, seromucous glands are visible. No signs of malignancy were found in this preparation.

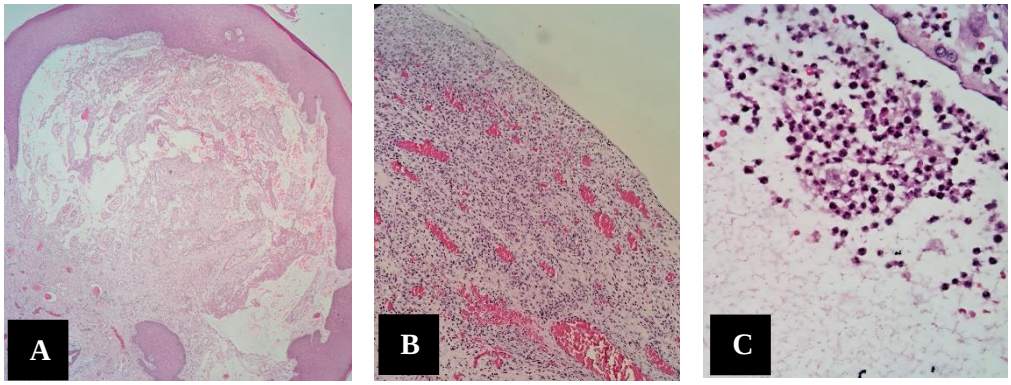

Figure 4. Microscopic appearance of Hematoxylin-Eosin staining. **A**. Biopsy cyst specimen shows polypoid tissue lined with squamous surface epithelium without signs of atypia. In the stroma, cyst formation is visible without lining epithelium. **B.** The cyst wall contains of granulation tissue and contains a distribution of neutrophil and lymphoplasmacytic inflammatory cells. **C.** The lumen of the cyst contains residual mucinous material with inflammatory cells.

Based on the clinical, intraoperative, and histopathological examination results, this case was concluded as a mucocele.

DISCUSSION

Mucous extravasation cyst is a type of mucocele with a relatively high prevalence of up to 80% of all mucocele cases[9]. The etiology of extravasation lesions is due to the rupture of the minor salivary glands and accumulation of mucin into the soft tissue; then, due to the body's response, granulation tissue forms around it. After traumatic rupture and mucus extravasation, remodeling of the extracellular matrix is the key mechanism underlying mucocele formation. The structures within it have an impact on the clinical appearance of the mucocele case that occurs. Clinically, mucoceles can be classified into papular and nodular forms. Papular has clear boundaries, superficial location, lighter color, and prominent horn-shaped lesions, while nodular lesions have unclear boundaries, deeper location, erythematous, and dome-shaped swelling. In gross size, nodules are usually larger than papules. Differences in lesion depth also determine the color of the lesion. The shallower the lesions, the more whitish they are because they are filled with mucus. In the case above, the nodule-formed lesion is formed by more granulation tissue compared to the papule-formed lesion, where inflammatory cell infiltration is more prominent. The nodule formation also has a relatively thicker epithelium layer due to the presence of granulation tissue[10].

Trauma to the lips stimulates mucosal keratinocytes. Stimulated keratinocytes then secrete pro-inflammatory cytokines such as IL-1, IL-6, and TNF-α. In cases of more profound trauma, rupture of the salivary glands causes mucus to leak into the dermis. This mucus then activates dermal macrophages, which then secrete TNF-α again. Excreted cytokines induce neutrophil and then inflammatory responses. This is also related to the stimulation of dermal fibroblasts to produce MMP-2 and MMP-9. After this stage, remodeling of the dermal matrix occurs[10].

The principle of diagnosing mucocele is based on the history of the disease, typical clinical appearance (pathognomonic), location of the lesion, and palpation. Clinically extravasation and

retention mucocele is similar to a bluish blister or nodule, measuring several millimeters to 2 cm, painless, felt when the pressure in the cavity increases, soft, transparent, soft palpation filled with fluid, and often found on the lower lip of older patients young. However, mucoceles can also occur at all ages, both newborn babies and older people[8,11]. However, sometimes mucoceles can appear atypically with varying sizes and locations and can occur without local trauma, such as cases of mucoceles appearing in the anterior buccal mucosa or extra-orally in the periorbital region[11,12]. In this case, if the appearance of a mucocele is outside the general criteria, it is necessary to carry out further examinations, such as an aspiration biopsy followed by an excisional biopsy for a histopathological examination to confirm the diagnosis.

Histopathological examination is essential to diagnose mucocele definitively by identifying the accumulation of mucin and glandular-associated tissue and ensuring that all glandular tissue has been removed. In the retention type, the cyst cavity has clear boundaries with epithelial walls lined by cuboidal epithelium or flat cells produced by the excretory ducts of the salivary glands, without any inflammatory reaction, and true cysts with epithelial lining. In the extravasation type, it is a pseudocyst without clear walls. This mucus is surrounded by a layer of inflammatory cells followed by reactive granulations consisting of fibroblasts due to the body's immune reaction. Even though they do not have an epithelial layer, they are well covered by granulation tissue. Apart from that, dermoscopic examination or mucoscopy, if used on oral lesions, can also be used as a non-invasive examination to examine the dermoscopy formation of various mucosal lesions, including oral mucocele[13–15].

The appearance of a bluish is caused by blockage of blood vessels, cyanosis of the tissue above, and accumulation of fluid beneath it. Mucoceles with a purplish grey appearance are pathologically caused by excessive amounts of mucoid material. However, color changes can also occur depending on the size of the lesion, distance to the surface, and flexibility of the overlying tissue[13].

Anamnesis of the patient's previous history needs to be carried out. An important cause of mucocele is trauma and/or obstruction of the salivary gland duct. Patients complain of having been bitten in that location or the trauma of brushing their teeth too hard[16]. In some cases, mucoceles can also rupture spontaneously due to trauma and can reappear (recurrence). If the mucocele ruptures and reappears continuously, the lesion becomes rubbery when palpated and cannot be ruptured easily. The differential diagnosis needs to be considered to prevent misdiagnosis. Traumatic fibroma is one of the differential diagnoses that does not have a soft texture and bluish color[1,8,17].

Several general methods that can be used to remove mucoceles are surgical excision, cryosurgery, diode laser therapy, and electrocautery. Among the many techniques, surgical excision is a simple, efficient, and widely used method. The incidence of recurrence is lower if the appropriate surgical method is performed. However, the drawback is that patients feel discomfort on the lips, and the potential for damage to adjacent channels will cause satellite lesions[14,18].

The marsupialization technique can be used if the lesion is extensive enough to prevent significant tissue loss and reduce the risk of complications damaging vital structures due to surgical excision. The advantage is that the time required is shorter, and the post-operative healing period is shorter. Patients also feel more comfortable. However, diagnosis via histopathology cannot be made, and if treatment fails, surgery still requires surgery. In addition, this technique is often associated with the incidence of mucocele recurrence[14,19].

The micro-marsupialization technique is carried out to drain accumulated saliva. This technique aims to reduce the size of the lesion. It is indicated for lesions measuring less than 1 cm and is more suitable for use in pediatric cases because this technique is simple, fast, and non-invasive. However, recurrence can still occur[14]

CONCLUSION

Dental practitioners can carry out mucocele management with a simple surgical approach with simple equipment. Subjective, objective, and supporting examinations are needed to establish a diagnosis. The excision method is used to reduce recurrence. The outcome of successful therapy requires long-term follow-up.

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