

**ORIGINAL RESEARCH**

# Intralesional corticosteroid therapy in the management of Oral Mucocele

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**ABSTRACT**

**Introduction:** Oral mucocele is considered as the most frequent benign minor (accessory) salivary gland lesion, which is brought on by mechanical stress to the gland's excretory duct. The standard therapy is surgical excision, which entails removing the whole tumor together with the related salivary gland. However, surgery may harm the nearby small salivary glands, which could result in the development of additional mucoceles. Steroid injections, cryosurgery, laser therapy, and micro-marsupialization are the examples of alternative therapies. **Aim and objective:** The goal of the current study was to assess the effectiveness of intralesional injections of betamethasone as a nonsurgical treatment option for oral mucoceles. **Materials and Methods:** A total of twenty individuals (10 males and 10 females, aged 10 to 30) with clinically diagnosed oral mucoceles, received an intralesional dose of one milliliter of betamethasone. After 7, 14, and 21 days, each patient underwent an examination to determine how the lesion responded to treatment and subsequently the second, third, and fourth injections. Treatment was stopped if the lesion cleared up after one or two injections. **Results:** Of the 20 patients, 4 patients had complete regression of the lesion, whereas 16 patients had a reduction in the size of the lesion. The overall p-value was <0.001. There was no report of recurrence. **Conclusion:** Intralesional steroid is a helpful and noninvasive therapy option for people for whom surgical treatment is not practical, although having a lower response rate than surgical removal.

**Keywords:** Mucocele, minor salivary glands, corticosteroid, intralesional, betamethasone.

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**INTRODUCTION**

Mucus-filled cavities, also known as mucocele, are one of the most frequent lesions of the oral mucosa, which arises from an accumulation of mucus secretion brought on by trauma, lip-biting behavior, or changes to minor salivary glands. These can develop in the lacrimal sac, appendix, gallbladder, paranasal sinuses, and oral cavity. The 17th most frequent salivary gland lesion observed in the oral cavity is mucocele. (1) The accumulation of liquid or mucoid material as a result of a modest salivary gland modification causes limited swelling, which is characterized by a bluish-colored, translucent, spherical, well-circumscribed lesion of varying sizes. (2) When palpated, they are often soft and fluctuant in consistency. Mucocele is a painless condition that frequently recurs. (3) People of different age groups, such as newborns, infants, and adults, might be affected by this lesion. Based on its histological and clinical features, the lesion is classified as a pseudocyst. They are thought to be benign growths that don't cause any symptoms, and they can last for years. (4) They fall into two

categories: I. The mucus extravasation form, which is thought to be caused by trauma, such as lip biting. II. The mucus retention form that arises from a minor or accessory salivary gland's duct becoming obstructed. (5) Mucocele manifests clinically as an asymptomatic pink or bluish-colored vesicle or bulla. Its size can vary from 1 mm to several centimeters, and its peak occurrence occurs between the ages of 10 and 20. (6) Although it can also grow in the cheek, tongue, palate, and floor of the mouth—where it is known as a ranula—the most commonly affected region is the lower labial mucosa. After any minor trauma, mucocele can appear within a few days, although its size eventually plateaus. If left untreated, they can remain unaltered for several months. (3) Treatment options include surgery, cryosurgery, laser ablation, sclerotherapy, micromarsupialization, laser surgery, and intralesional injection of corticosteroid or sclerosing agent (7). Surgery is frequently performed, but it has a number of drawbacks, including the potential for lip deformity and injury to nearby ducts that may lead to the development of satellite lesions

[4]. Furthermore, surgery might be intrusive and result in behavioral and psychological problems in young kids, which calls for general anesthesia or sedation. (1)Noninvasive treatments lead to more successful behavior management in pediatric patients. (8)Taking this background into account, the current study was conducted to assess the effectiveness of intralesional corticosteroid injection (betamethasone) as a nonsurgical therapy approach for oral mucoceles.

#### MATERIALS AND METHOD

A total of twenty individuals, both male and female, with clinically diagnosed oral mucoceles between the ages of 10 and 30 who were seen in the Oral Medicine outpatient department were included in the study. Informed consent was acquired for all subjects once they were informed of the significance of the study. The trial excluded patients who did not want to get injections and who had a history of contraindications to systemic steroids.

The following clinical characteristics were used to make the primary diagnosis for each subject: location, trauma history, quick appearance, size fluctuations, bluish hue, and consistency. First, a syringe and an 18-gauge-needle were used to aspirate mucus after surface local anesthetic was given. Subsequently, a 0.25\* 8mm insulin syringe with 31 gauge was used to slowly inject 1 mL of betamethasone (4 mg/1 mL) in order to minimize pain and discomfort and prevent any leaking. The lesion's base and the area immediately surrounding it were gradually filled with the solution.

After 7, 14, and 21 days, all of the patients underwent examinations to determine how the lesion responded to treatment. Following this, the second, third, and fourth injections were administered. The course of treatment was stopped if the lesion cleared up after the initial injection. Using a dental caliper, the lesion's size was determined at a weekly evaluation. The patients were assessed at 1, 3, and 6 months following the end of treatment to look for recurrence.



**Fig. 1** Measuring anteroposterior dimension of mucocele



**Fig.2** Measuring mediolateral dimension of mucocele



**Fig.3** Syringe containing mucus, aspirated by 18 gauge needle



**Fig.4** Intralesional corticosteroid injection placement

## RESULTS

A total of 20 cases of oral mucocele with a clinical diagnosis were chosen for the investigation. Every individual received a weekly injection of 1 mL of betamethasone for 4 weeks until the lesion healed. They were subject to periodic recall for a maximum of six months, as well as weekly evaluations on days 7, 14, and 21. Using a dental caliper, the lesion's size was determined to range from 2 to 25 mm. Every patient received a maximum of four injections in a row at weekly intervals. With the exception of few patients' reports of minor pain and local discomfort, which subsided in an hour, there were no postoperative problems. The distribution of the cases

in which intralesional corticosteroid injection was given is shown in Table 1. The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Statistical software SPSS (version 20.0) and Microsoft Excel were used to carry out the statistical analysis of data. Continuous variables were expressed as Mean $\pm$ SD and categorical variables were summarized as percentages. Paired t-test was employed to compare the size of lesion before and after injection. A P-value of less than 0.05 was considered statistically significant.

**Table 1: Distribution of cases in intralesional corticosteroid therapy in oral mucocele.**

Case no.	Location	Size of the lesion in mm (pre-op)	Number of injections given	Size of the lesion in mm (post-op)
1	Lower labial mucosa	25*23	4	10*10
2	Lower labial mucosa	13*12	4	0
3	Lower labial mucosa	5*5	4	0
4	Floor of mouth	2*2	1	0
5	Lower labial mucosa	14*12	4	6*5.9
6	Lower labial mucosa	11*8.6	4	5*5
7	Lower labial mucosa	6*5	4	3*3
8	Lower labial mucosa	12*8	4	4*3
9	Lower labial mucosa	16*14	4	10*10
10	Lower labial mucosa	6*5.6	4	3*2
11	Tongue	10.7*9	3	3*3
12	Lower labial mucosa	16*13	4	14*12
13	Lower labial mucosa	10*9.4	4	5*5
14	Lower labial mucosa	12.5*10.7	4	5*4
15	Lower labial mucosa	7.7*6.4	4	4*3
16	Lower labial mucosa	10*10	4	5*4
17	Lower labial mucosa	6*6	4	2*1
18	Lower labial mucosa	6*5	4	0
19	Lower labial mucosa	12*10	4	5*4
20	Lower labial mucosa	6*5.6	4	2*1

It was discovered that the most prevalent location was the lower labial mucosa (18 cases) followed by floor of mouth (1 case) and tongue (1 case).

Of the 20 instances, 4 cases had a full resolution of the lesion, while the other 16 cases showed regression in the size of the lesion. There was an average mean size of 10.9 mm before the injection which reduced to a mean 4.3 mm for the twenty patients (Graph 1).

Also, the Confidence interval decreased from a range of 8.67-13.21 before the injection to a range of 2.59-6.01 after the injection, with a p-value of <0.001 (statistically significant) as depicted in Table 2. Also, few cases showed bluish discoloration of the lesion after first or second injection, which later resolved in some till the last injection whereas persisted in some.





**Case 1. Mucoccele with respect to left labial mucosa before injection**



**Case 1. Resolution of the mucoccele after 4 injections of steroid.**



**Case 2. Mucoccele with respect to right labial mucosa before injection**



**Case 2. Resolution of the Mucoccele after 4 injections of steroid**

<b>Table 2: Size of lesion (mm) before and after injection</b>					
<b>Time interval</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>95% CI For Mean</b>	<b>P-value</b>
Before Injection	20	10.9	4.85	8.67-13.21	<0.001*
After Injection	20	4.3	3.65	2.59-6.01	

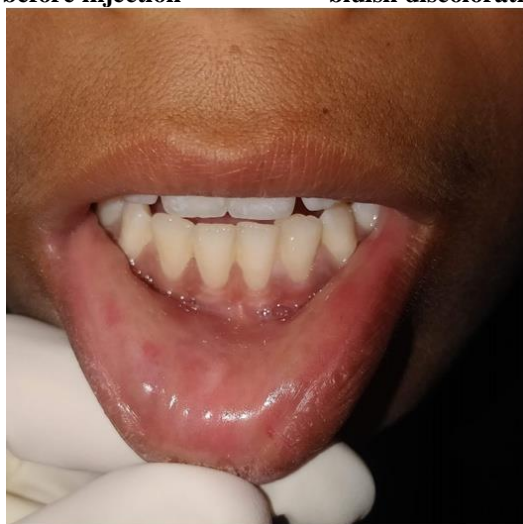
\*Statistically Significant Difference (P-value<0.05); P-value by Paired t-test



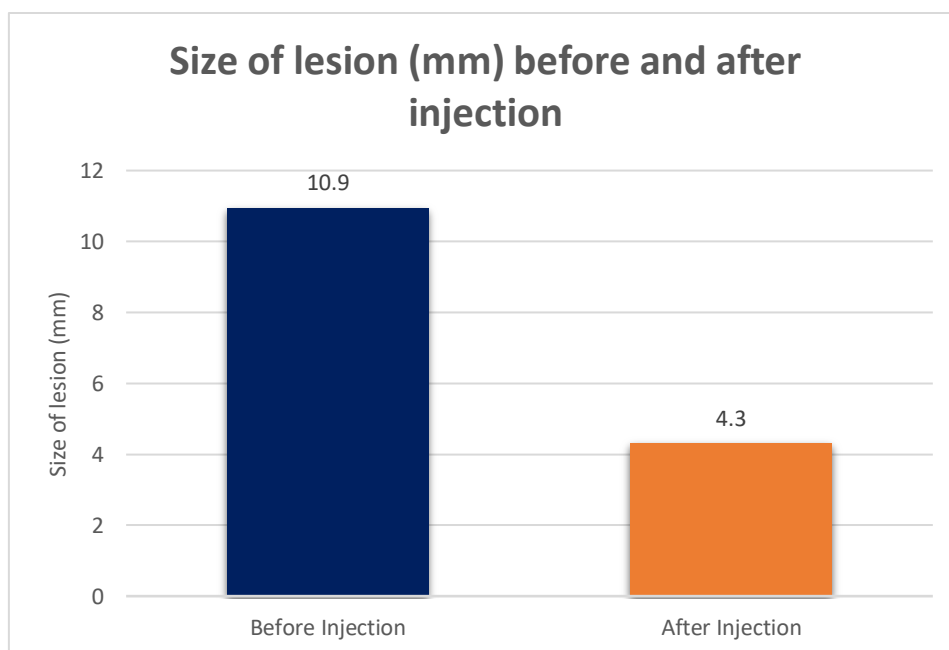
**Case 3. Mucocele with respect to right labial mucosa before injection**



**Case 3. Regression in the size of lesion with bluish discoloration after first injection**



**Case 3. Regression of the lesion after 4 injections of steroid.**



**Graph 1: Regression in the size of the lesion after injection**

## DISCUSSION

The term "mucocele" refers to a swelling that results from the accumulation of saliva from a severed or clogged small salivary gland duct. It is a self-limiting mucous-containing salivary gland cyst that often develops in the oral cavity, varies in size and shows rapid development. The lesion may have ruptured, resulting in an accumulation of mucin or the reabsorption of saliva deposits, which could lead to the lesion reforming after its size has decreased.(9)

Research has indicated that parafunctional habits like lip biting and sucking are among the etiologic factors for oral lesions including mucocele and irritant fibroma.(10) To determine whether sialoliths are thought to be a contributing factor in the formation of oral and cervical ranulas, radiographic assessment is required. The mucus retention phenomenon is demonstrated by fine needle aspiration cytology. Protein content and a high amylase level could be shown by the chemical analysis. Magnetic resonance imaging and computed tomography scans can be used to locate the lesion and identify its source.(11) Palpation is useful in making an accurate differential diagnosis. Cysts, mucoceles, abscesses, and hemangiomas exhibit fluctuation, while lipomas and tumors of small salivary glands do not.(12)

Surgical excision of the glandular tissue and surrounding mucosa beneath the muscle layer is the standard treatment modality. The mucocele could be easily punctured to release the content, but as soon as the wound healed, the lesion would return.(13) Treatment recommendations include surgical excision and removal of the affected accessory salivary gland. Marsupialization will simply cause repetitions.(3)

Surgical techniques can cause trauma, pain, lip deformity, damage to nearby critical structures, and ducts that contribute to the development of satellite lesions. They can also be costly for the patient.(6)

Lower lip has been shown to be the most common site (18 cases), followed by floor of the mouth and lateral border of tongue (1 case each) in the current investigation. Clinically, they appear as soft, translucent, blue-colored cystic swellings that range in size from a few millimeters to three centimeters. Although these lesions are usually asymptomatic, if they are extremely large in size, they may cause discomfort while talking and mastication. The lesion's length varies and can last anywhere from a few days to three years.(14) These results were in concordance with the subjects that were examined in this investigation.

Out of the various modalities, we have implemented a nonsurgical treatment strategy using very effective corticosteroids, such as Betamethasone. The most effective anti-inflammatory agent is Corticosteroid, which have the ability to increase the transcription of genes encoding anti-inflammatory proteins such as lipocortin-1, interleukin-1, and interleukin-10 receptor antagonist. Multiple inflammatory genes include those

encoding cytokines, chemokines, adhesion molecules, inflammatory enzymes, receptors, and proteins are inhibited by steroids.(15) Also, they act as sclerosing agents leading to the shrinkage of the dilated salivary ducts.(16) Another benefit of this approach is that it is easy to use, painless, and causes little trauma.(17)

The present study was carried out in 20 oral mucocele patients treated with intralesional corticosteroid injections, where complete resolution in 4 cases was observed, whereas regression in the size of the mucocele was noticed in 16 cases.

The main objective of this procedure was to drain the mucus and reduce the size of the lesion.

A similar case series was described by Baharvand et al. in 2014, in which two instances showed reduction in size and seven cases treated with dexamethasone were completely cured. With the exception of one patient's reported local discomfort, no long-term complications occurred after surgery (16). A large labial mucocele that was treated with a combination of intralesional dexamethasone and micromarsupialization resulted in full healing, according to Mortazavi et al. (2014) (17). A study was conducted by Rupam Sinha et al. in 2016, in which betamethasone injections were given weekly for 4 weeks into the lesion and complete regression was observed in 18 out of 20 cases.(15)

When compared to topical steroids, intralesional steroids have a few advantages such as avoiding the oral mucosal barrier, decreasing the likelihood of mucosal atrophy, and delivering larger concentrations of medication to the lesion site.(18) The sole drawback is that intralesional injection requires more intrusive techniques than topical steroid application.(19)

The high-potency vasoconstriction and anti-inflammatory qualities of this medication, which lessen the inflammatory process involved in the etiology of mucoceles, are probably responsible for the effectiveness of corticosteroid therapy.(17)

## CONCLUSION

Mucocele is difficult to treat because of the high likelihood of recurrence. Both surgical and nonsurgical methods can be used. The lesion's size, location, patient age, depth, and material availability all influence the treatment plan that is selected. Intralesional corticosteroid therapy is a good nonsurgical approach that can be completed quickly, affordably, and more aesthetically pleasing than laser ablation, cryotherapy, or surgery. It is a rather easy-to-use, dependable, affordable, and maybe curative therapy that the patient will readily embrace. However, in our study corticosteroid showed an overall reduction in the size of large mucoceles and resolution of smaller ones but it didn't prove much beneficial in completely resolving the lesion in all cases. Hence, we can conclude that intralesional steroids can be used in cases where patients are non-compliant for surgeries and also can help in the reduction of the size of the large mucoceles before surgical excision is planned.

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1. Yermalkar GS, Shashikiran ND, Gaonkar N, Gugawad S, Hadakar SG, Waghmode S, et al. Nonsurgical Treatment of Oral Mucocele With Intralesional Corticosteroid Injections: A Case Report. *Cureus* [Internet]. 2024 Aug 21 [cited 2024 Oct 13];16. Available from: <https://www.cureus.com/articles/273845-nonsurgical-treatment-of-oral-mucocele-with-intralesional-corticosteroid-injections-a-case-report#!/>
2. Bagán Sebastián JV, Silvestre Donat FJ, Peñarrocha Diago M, Milián Masanet MA. [Clinico-pathological study of oral mucoceles]. *Av Odontostomatol*. 1990 Sep 1;6(7):389–91, 394–5.
3. Nallasivam KU, Sudha BR. Oral mucocele: Review of literature and a case report. *Journal of Pharmacy and Bioallied Sciences*. 2015 Aug;7(Suppl 2):S731.
4. Scribante A, Pellegrini M, Pulicari F, De Martino F, Li Vigni G, Ghizzoni M, et al. Oral Cavity Mucocele and Different Surgical Treatment Strategies: Is Laser Excision Effective? A Scoping Review. *Applied Sciences*. 2023 Jan;13(22):12327.
5. 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(2):155–8.
6. Baumash HD. Mucoceles and ranulas. *J Oral Maxillofac Surg*. 2003 Mar;61(3):369–78.
7. Ac L, Kr H, Ca L, Sk H, Da M. Treatment of painful and recurrent oral mucoceles with a high-potency topical corticosteroid: a case report. *Journal of oral and maxillofacial surgery : official journal of the American Association of Oral and Maxillofacial Surgeons* [Internet]. 2008 Aug [cited 2024 Oct 13];66(8). Available from: <https://pubmed.ncbi.nlm.nih.gov/18634966/>
8. Gholami N, Assistant Professor, Department of Oral and Maxillofacial Medicine, Badakhsh S, Assistant Professor, Department of Pediatric Dentistry,. A noninvasive approach for management of recurrent oral mucocele in pediatric patients: a therapeutic case report. *J Res Dentomaxillofac Sci*. 2018 Aug 1;3(3):49–52.
9. More CB, Bhavsar K, Varma S, Tailor M. Oral mucocele: A clinical and histopathological study. *J Oral Maxillofac Pathol*. 2014 Sep;18(Suppl 1):S72–7.
10. Barbería E, Lucavechi T, Cárdenas D, Maroto M. An atypical lingual lesion resulting from the unhealthy habit of sucking the lower lip: clinical case study. *J Clin Pediatr Dent*. 2006;30(4):280–2.
11. T Y, N T, M S, M F. Clinicostatistical study of lower lip mucoceles. *Head & neck* [Internet]. 1990 Aug [cited 2024 Oct 13];12(4). Available from: <https://pubmed.ncbi.nlm.nih.gov/2193904/>
12. Guimarães MS, Hebling J, Filho V a. P, Santos LL, Vita TM, Costa C a. S. Extravasation mucocele involving the ventral surface of the tongue (glands of Blandin-Nuhn). *Int J Paediatr Dent*. 2006 Nov;16(6):435–9.
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 May;65(5):855–8.
14. Kumar V, Madan E. Oral mucocele on lower lip. 11.
15. Sinha R, Sarkar S, Khaitan T, Kabiraj A, Maji A. Nonsurgical Management of Oral Mucocele by Intralesional Corticosteroid Therapy. *International Journal of Dentistry*. 2016;2016:1–5.
16. Baharvand M, Sabounchi S, Mortazavi H. Treatment of Labial Mucocele by Intralesional Injection of Dexamethasone: Case Series. *Journal of Dental Materials and Techniques*. 2014 Sep 1;3(3):128–33.
17. Mortazavi H, Baharvand M, Alirezaei S, Noor-Mohammadi R. Combination therapy in a large lower lip mucocele: A non-invasive recommended technique. *Dental Hypotheses*. 2014 Jan 1;5.
18. Sastre J, Mosges R. Local and systemic safety of intranasal corticosteroids. *J Investig Allergol Clin Immunol*. 2012;22(1):1–12.
19. Luiz AC, Hiraki KRN, Lemos CA, Hirota SK, Migliari DA. Treatment of painful and recurrent oral mucoceles with a high-potency topical corticosteroid: a case report. *J Oral Maxillofac Surg*. 2008 Aug;66(8):1737–9.