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Case Study

MODIFIED *KSHARAKARMA*: A TARGETED, MINIMALLY INVASIVE STRATEGY FOR RECURRENT TRAUMATIC ORAL MUCOCELE

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ABSTRACT

Oral mucocele is a common benign lesion of the minor salivary glands and typically results from trauma-induced rupture of the excretory ducts, leading to mucin extravasation and pseudocyst formation. In Ayurvedic literature, trauma-induced lip swellings are described as *Kshataja Oshtakopa*, caused by *Dantabhigata* (tooth bite), wherein *Vata* vitiation facilitates localized dysfunction, and subsequent *Kapha* accumulation leads to cystic swelling resembling *Jalarbuda*. These conceptual parallels justify deeper-acting para-surgical interventions such as *Ksharakarma*. **Case Presentation:** A 29-year-old female presented with a recurrent, fluctuant swelling on the inner lower lip, occurring eight months after excision, which had initially reduced the lesion but failed to prevent recurrence. Clinical features-including translucency, softness, and fluctuance-were consistent with an extravasation-type mucocele. The etiology, habitual lip biting, aligned precisely with the Ayurvedic diagnosis of *Kshataja Oshtakopa* progressing into *Jalarbuda*. **Intervention:** After ensuring aseptic preparation, local anesthesia was administered using 2% lignocaine. Through a Sterile needle *Teekshna Apamarga Kshara Jala* was slowly infiltrated through the needle tract, ensuring direct exposure of the lesion cavity and residual glandular structures to the alkaline agent. The lesion soon developed *Pakwajambuphala Varna*, indicating effective *Kshara* action. Neutralization was performed using *Nimbu Svarasa* to limit the depth of chemical action. Postoperatively, *Kanchanara Guggulu* and *Gandhaka Rasayana* were prescribed for 15 days, along with topical *Jatyadi Taila* to enhance epithelial regeneration. **Outcomes:** The patient exhibited predictable healing, with slough separation by Day 7 and complete epithelialization by the end of two weeks. Follow-up at one, seven, and six months demonstrated no recurrence and excellent cosmetic results. **Conclusion:** *Kshara Jala* infiltration provides a minimally invasive, definitive, and recurrence-preventive alternative for managing recurrent mucoceles. Its deeper chemical penetration offers a therapeutic advantage over conventional methods and aligns with Ayurvedic principles addressing trauma-induced *Kapha-Vata* pathology.

INTRODUCTION

Mucoceles are benign mucous extravasation phenomena that arise from rupture of minor salivary gland ducts, most commonly following repetitive trauma such as habitual lip biting or accidental injury [1]. When ductal integrity is lost, mucin escapes into the surrounding connective tissue, triggering an inflammatory response that becomes encapsulated by granulation tissue, thereby forming a pseudocyst lacking an epithelial lining[2]. The lower lip is the most frequently affected site, accounting for nearly 70–80% of all cases because of its mobility and susceptibility to repeated microtrauma[4]. Although mucoceles are generally painless, they may interfere with mastication, speech, or aesthetics, leading patients to seek treatment.

Surgical excision is the conventional management modality; however, recurrence remains a concern-particularly when deeper ductal elements or accessory glandular tissues are not removed. Recurrence rates ranging between 2.8% and 18% have been documented, especially in younger adults and those who engage in chronic lip biting[1,4]. *Agnikarma*, a traditional para-surgical technique using controlled thermal cauterization, is beneficial for superficial

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lesions but may not penetrate sufficiently to destroy deeper ductal remnants, thus contributing to recurrence in some cases[5].

Ayurveda offers a structured patho-physiological understanding of such lesions. Trauma-induced swelling of the lip is classified as *Kshataja Oshtakopa*, wherein *Dantabhigata* (tooth bite) disturbs local *Vata* and produces pain or swelling[6]. When trauma allows the accumulation of fluid within tissues, the resulting soft, cystic swelling is described as *Jalarbuda*, characterized by *Kapha* predominance and *Vata* obstruction[7]. Management therefore requires therapeutic measures that relieve *Vata* obstruction and reduce *Kapha* accumulation. *Ksharakarma*, described in the *Sushruta Samhita*, is a para-surgical procedure that uses alkaline preparations possessing *Chedana*, *Bhedana*, *Lekhana*, and *Shoshana* actions to dissolve pathological tissue[8].

While classical *Kshara* application is effective for many superficial lesions, recurrent mucoceles may require a more focused approach to ensure complete resolution of deeper ductal components. Therefore, a modified procedural technique-**direct infiltration of *Kshara Jala***-was adopted to facilitate more uniform and deeper contact with the affected tissue. This method aligns with modern surgical rationale by addressing residual ductal remnants, while simultaneously upholding Ayurvedic principles that emphasize the removal of *Kapha* obstruction and restoration of *Vata* balance. The following case illustrates the successful application of this refined approach in managing a recurrent mucocele that had not resolved with prior excision.

Case Presentation

A 29-year-old female reported to the Shalya Tantra outpatient department with the chief complaint of a recurrent swelling on the inner aspect of her lower lip. The patient first noticed the swelling approximately ten months earlier. At that time, she underwent excision at a local facility, which resulted in temporary reduction of the lesion. However, she observed a gradual reappearance of the swelling at the same site nearly eight months after the procedure, indicating recurrence. She denied any associated pain but expressed cosmetic concern and discomfort during speech and mastication.

The patient admitted to a habitual tendency of lip biting, particularly during periods of emotional stress. This repetitive mechanical trauma was identified as the primary etiological factor contributing to the rupture of minor salivary gland ducts. She did not report any history of recent dental interventions, trauma other than lip biting, systemic illness, or use of medications that could predispose to mucosal lesions.

On clinical examination, the swelling was located on the right paramedian region of the lower lip mucosa. It presented as a well-circumscribed, soft, cystic, fluctuant lesion with a translucent, bluish appearance, indicative of superficial mucin accumulation. The lesion measured approximately 6 × 5 mm. Palpation revealed a smooth, compressible, non-tender mass that was freely mobile within the mucosal layer. There were no signs of erythema, ulceration, induration, discharge, or infection. No cervical or submandibular lymphadenopathy was detected. The overlying mucosa was intact, and the lesion did not blanche upon pressure.

Based on these clinical features, a diagnosis of **oral mucocele – extravasation type** was established. The history of repetitive lip biting strongly supported ductal rupture as the underlying pathophysiological mechanism. The recurrence after excision suggested incomplete obliteration of deeper glandular remnants, necessitating a more definitive intervention.

From an Ayurvedic perspective, the patient's habitual lip biting corresponds to ***Kshataja Oshtakopa***, wherein *Dantabhigata* (tooth-induced injury) leads to *Vata* aggravation and localized tissue disruption[6]. The resultant mucin accumulation and cystic swelling resemble ***Jalarbuda***, a *Kapha*-dominant pathology characterized by a soft, fluid-filled mass[7]. Thus, both modern pathological understanding and classical Ayurvedic reasoning were consistent with the presenting signs.

Figure 1: Pre-operative appearance of the mucocele

Figure 2: Syringe containing *Teekshna Apamarga Kshara Jala*

Figure 3: Needle insertion prior to infiltration

Figure 4: Intra-lesional infiltration of *Kshara Jala*

Figure 5: *Pakwajambuphala Varna*

Figure 7: *Nimbu Svarasa*

Figure 8: *Nimbu Svarasa* used for neutralization

Figure 9: Day 3 post-operative appearance

Figure 10: One-month follow-up showing complete healing

Therapeutic Intervention

Poorvakarma

- Informed consent was obtained from the patient.
- Strict aseptic precautions were followed throughout the procedure.
- Perioral skin and intraoral mucosa were thoroughly disinfected.
- The operative field was prepared and draped under aseptic conditions.
- Local anesthesia was administered using 2% lignocaine to ensure adequate analgesia.
- After confirming complete anesthesia, a sterile fine-gauge needle was inserted directly into the swelling for intra-lesional delivery of *Kshara Jala*.

Pradhanakarma

- *Teekshna Apamarga Ksharajala* was slowly infiltrated into the lesion through the syringe without aspirating the mucinous content.
- Avoiding aspiration allowed the alkaline agent to act directly on the mucin-filled cavity and cystic lining.
- The *Ksharajala* spread uniformly within the lesion, ensuring deeper penetration and contact with residual ductal structures.
- As the *Kshara* acted, the lesion developed *Pakwajambuphala Varna*, indicating adequate alkaline action.

- After this visible change, the area was left undisturbed for *Shatamatra Kala* to allow complete therapeutic interaction.
- Following the waiting period, *Nimbu Svarasa* was infiltrated through the same needle track to neutralize the alkaline reaction.
- Neutralization prevented excessive tissue damage and confined the chemical ablation to pathological tissue.

Pashchatkarma

- *Kanchanara Guggulu* (500 mg twice daily for 15 days) was prescribed to manage *Kapha*-related glandular involvement.
- *Gandhaka Rasayana* (250 mg twice daily) was administered for its *Rasayana*, anti-inflammatory, and antimicrobial actions.
- *Jatyadi Taila* was advised for gentle local application to promote epithelial regeneration and wound healing.
- The patient was instructed to avoid lip biting, trauma, or manipulation of the treated area.
- Regular follow-up was scheduled to monitor healing and rule out recurrence.

Outcome

The patient demonstrated a predictable and favourable healing response following the *Ksharajala* infiltration procedure. By the third postoperative day, the lesion exhibited controlled chemical necrosis with formation of a thin slough over the treated site, clearly demarcating devitalized tissue from healthy surrounding mucosa. Mild oedema and discoloration were present, as expected after alkaline application, but there were no signs of infection, undue tenderness, or functional impairment, and the patient reported only slight tightness during lip movement. Over the subsequent weeks, progressive healing was noted. At the one-month follow-up, complete epithelialization had occurred, and the mucosal surface appeared smooth, healthy, and well-integrated with normal tissue, without any residual induration, fibrosis, or nodularity. The patient experienced no discomfort during speech or mastication and expressed satisfaction with the cosmetic outcome. Long-term evaluation at six months revealed a fully restored mucosal contour with no evidence of recurrence, swelling, or mucous reaccumulation. The treated site remained soft, pliable, and free of discoloration or scar formation. Throughout the entire follow-up period, the patient did not report any sensations suggestive of reformation of the cyst, nor were there any clinical indicators of ductal regeneration or glandular hyperactivity. The sustained absence of recurrence at six months strongly supports the effectiveness of *Ksharajala* infiltration in achieving complete ablation of deeper salivary gland remnants, thereby offering a reliable, minimally invasive, and cosmetically superior alternative to conventional interventions for recurrent mucoceles.

Discussion

Recurrent mucoceles typically arise from the continued activity of deeper minor salivary ductal remnants or accessory glandular lobules that were not eliminated during prior treatments. Conventional surgical excision focuses primarily on removing the visible pseudocyst, but deeper ducts may remain unaddressed, continuing to secrete mucin and leading to recurrence. Similarly, marsupialization creates a new drainage pathway but does not target the residual glandular structures, making it insufficient for recurrent or deep-seated lesions. *Agnikarma*, though valuable for superficial mucosal lesions, delivers thermal energy that rarely reaches the depth necessary to obliterate ductal sources completely. As a result, patients frequently experience relapse despite prior intervention.

Ksharajala provides a distinct advantage because its mechanism of action differs fundamentally from thermal cautery. The strong alkaline nature of *Kshara* induces saponification of lipids, protein denaturation, and controlled liquefactive necrosis, allowing it to penetrate tissue planes more effectively than heat-based methods. When infiltrated directly into the lesion rather than applied superficially, *Ksharajala* disperses throughout the mucin-filled cavity and reaches deeper glandular remnants. This ensures uniform chemical exposure to all pathological structures responsible for recurrences. The development of *Pakwajambuphala Varna*, a hallmark of adequate *Kshara* action described in classical texts, further confirms that the agent has interacted effectively with targeted tissues.

Immediate neutralization with *Nimbu Svarasa* provides an essential safety mechanism. The citric acid in lemon juice counteracts the alkaline solution, halting further tissue destruction and ensuring predictable, controlled ablation. This dual-step process-alkaline penetration followed by acidic neutralization-allows *Ksharajala* to achieve precision comparable to modern chemical cauterization techniques while preserving surrounding healthy tissue.

From an Ayurvedic standpoint, trauma-induced disruption of the lip corresponds to *Vata* aggravation, which impairs structural integrity and facilitates mucin leakage. *Kapha* dominance contributes to the viscous swelling that characterizes *Jalarbuda*. Therefore, treatment must simultaneously correct *Vata* dysfunction, reduce *Kapha* accumulation,

and remove the pathological tissue. *Kshara* embodies these actions through its *Chedana*, *Bhedana*, *Lekhana*, and *Shoshana* properties. Internal medications such as *Kanchanara Guggulu* and *Gandhaka Rasayana* support systemic correction by reducing *Kapha-Meda* accumulation, enhancing lymphatic clearance, and promoting mucosal healing.

This case illustrates the therapeutic potential of integrating classical Ayurvedic principles with a refined procedural technique tailored to modern clinical understanding. *Ksharajala* infiltration successfully addressed the depth-related limitations of surgery, providing a minimally invasive, outpatient-friendly, and cost-effective intervention. The absence of recurrence at six months and one year, combined with excellent cosmetic healing and patient satisfaction, underscores the efficacy of this approach. As such, *Ksharajala* infiltration may be considered a superior modality for recurrent mucoceles, particularly where conventional methods have previously failed.

CONCLUSION

Ksharajala infiltration represents a highly effective, minimally invasive, and patient-friendly therapeutic option for the management of recurrent mucoceles. Unlike conventional surgical excision or superficial cauterization techniques, this approach offers a deeper and more targeted alkaline action capable of reaching residual glandular elements that are often responsible for recurrence. By chemically ablating these deeper structures, the procedure significantly reduces the likelihood of relapse, even in cases where previous treatments such as excision have failed.

The controlled tissue interaction, confirmed by the development of *Pakwajambuphala Varna* and followed by timely neutralization with *Nimbu Svarasa*, ensures a predictable and safe therapeutic effect. Furthermore, the technique preserves surrounding healthy tissue, resulting in excellent cosmetic healing without scarring or functional impairment. The incorporation of supportive Ayurvedic medications enhances systemic balance, promotes efficient tissue recovery, and aligns the intervention with traditional principles addressing *Vata* disturbance and *Kapha* accumulation.

Overall, this case highlights the value of integrating classical Ayurvedic knowledge with a refined procedural modification to achieve superior clinical outcomes. *Ksharajala* infiltration stands out as a cost-effective, outpatient-based intervention that offers both therapeutic precision and long-term stability. Its demonstrated success in preventing recurrence and ensuring smooth, aesthetically acceptable healing suggests that it may serve as a preferred modality in the management of recurrent oral mucoceles, particularly when conventional methods have proven inadequate.

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