

MICRO-MARSUPIALIZATION WITH POLYGLACTIN 910 (0-0) ABSORBABLE SUTURES FOR ORAL MUCOCELES AND RANULAS: A CASE SERIES

MICROMARSUPIALIZAÇÃO COM SUTURAS ABSORVÍVEIS DE POLIGLACTINA 910 (0-0) PARA MUCOCELES E RÂNULAS ORAIS: UMA SÉRIE DE CASOS

JOSÉ ALCIDES ALMEIDA DE ARRUDA^{1*}, VÍCTOR ZANETTI DRUMOND², LUÍS OTÁVIO PEREIRA DA SILVA³, LUCAS GUIMARÃES ABREU⁴, ISIS SAMARA DE MELO QUEIROGA⁵, GERHILDE CALLOU SAMPAIO⁶, BRUNO AUGUSTO BENEVENUTO DE ANDRADE⁷, RICARDO ALVES MESQUITA⁸

1. DDS, MSc and PhD, School of Dentistry, Universidade Federal de Alfenas, Alfenas, Brazil; 2. DDS and MSc, Department of Oral Surgery, Pathology and Clinical Dentistry, School of Dentistry, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil; 3. DDS, Department of Oral Surgery, Pathology and Clinical Dentistry, School of Dentistry, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil; 4. DDS, MSc and PhD, Department of Child and Adolescent Oral Health, School of Dentistry, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil; 5. DDS, Department of Oral and Maxillofacial Surgery and Pathology, School of Dentistry, Universidade de Pernambuco, Recife, Brazil; 6. DDS, MSc and PhD, Department of Oral and Maxillofacial Surgery and Pathology, School of Dentistry, Universidade de Pernambuco, Recife, Brazil; 7. DDS, MSc and PhD, Department of Oral Diagnosis and Pathology, School of Dentistry, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; 8. DDS, MSc and PhD, Department of Oral Surgery, Pathology and Clinical Dentistry, School of Dentistry, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil.

* Rua Gabriel Monteiro da Silva, 700, Centro, Alfenas, Minas Gerais, Brasil. CEP: 37130-001. alcides_almeida@hotmail.com

Recebido em 16/06/2026. Aceito para publicação em 10/08/2026

ABSTRACT

This article aims to report a case series of individuals with oral mucocele or ranula managed using a modified micro-marsupialization technique with 0-0 absorbable sutures. This approach builds on previous reports highlighting the advantages of absorbable sutures in micro-marsupialization. Seven patients (four females, three males; mean age: 21.7 years) clinically diagnosed with mucocles (lower lip) or ranulas (floor of mouth) were included. After topical anesthesia, 0-0 absorbable polyglactin 910 sutures were placed through the lesion to create multiple drainage tracts. Follow-up evaluations were conducted at 7, 21, and 30 days. The primary outcomes were complete clinical healing and recurrence, while secondary outcomes were complications and patient satisfaction. Lesion size ranged from 5–20 mm (mean: 10.1 mm). All cases achieved complete clinical healing with no recurrences observed during a follow-up period of 5–109 months. No postoperative complications occurred. Patient-reported satisfaction was uniformly maximal (10/10), and the procedure was described as comfortable and well tolerated. Micro-marsupialization with fine 0-0 absorbable sutures proved to be effective, safe, and acceptable to patients. The technique preserves the minimally invasive advantages of micro-marsupialization, supporting its application in routine practice and resource-limited settings.

KEYWORDS: Micro-marsupialization; Mucocele; Oral surgery; Ranula; Sutures.

RESUMO

Este artigo busca relatar uma série de casos de indivíduos com mucocele ou rânula oral tratados com uma técnica modificada de micromarsupialização utilizando suturas absorvíveis 0-0. Esta abordagem baseia-se em relatos anteriores que destacam vantagens das suturas absorvíveis na micromarsupialização. Sete pacientes (quatro mulheres, três homens; idade média: 21,7 anos) com diagnóstico clínico de mucocele (lábio inferior) ou rânula (assoalho bucal) foram incluídos. Após anestesia tópica, suturas absorvíveis 0-0 de poliglactina 910 foram aplicadas na lesão para criar múltiplos trajetos de drenagem. Acompanhamentos foram realizados aos 7, 21 e 30 dias. Os desfechos primários foram a cicatrização clínica completa e a recorrência, enquanto os secundários foram complicações e satisfação do paciente. O tamanho das lesões variou de 5 a 20 mm (média: 10,1 mm). Todos os casos alcançaram cicatrização clínica completa, sem recorrências durante um período de acompanhamento de 5 a 109 meses. Não ocorreram complicações pós-operatórias. A satisfação relatada pelos pacientes foi uniformemente máxima (10/10), e o procedimento foi descrito como confortável e bem tolerado. A micromarsupialização com suturas absorvíveis 0-0 mostrou-se eficaz, segura e aceitável para os pacientes. A técnica preserva vantagens minimamente invasivas da micromarsupialização, justificando sua aplicação na rotina clínica e em contextos com recursos limitados.

PALAVRAS-CHAVE: Micromarsupialização; Mucocele; Cirurgia bucal; Rânula; Sutures.

1. INTRODUCTION

Oral mucocoeles are benign, pseudocystic lesions arising from minor salivary glands, typically resulting from mucus extravasation after ductal rupture or, less frequently, by mucus retention resulting from ductal obstruction¹. Clinically, they are presented as soft, fluctuant, translucent, or bluish nodules, most often located on the lower lip²⁻⁴. The reported prevalence is approximately 2.5 cases per 1,000 individuals, with nearly two-thirds occurring in patients younger than 30 years^{3,5}. In biopsy-based pediatric series, mucocoeles are frequently represented among reactive/inflammatory lesions⁶. When a mucocoele arises on the floor of the mouth, it is referred to as a ranula, which typically originates from the sublingual gland. Ranulas may be classified as simple (intraoral) or plunging, the latter extending through or around the mylohyoid muscle into the cervical region. Ranula predominantly affect individuals in the second decade of life and show a slight female predominance^{3,4}.

Management options for oral mucocoeles and ranulas include conventional surgical excision, marsupialization, micro-marsupialization using sutures to create epithelialized drainage tracts, high-power laser excision, cryotherapy, and intralesional therapies such as corticosteroid injections and sclerotherapy with OK-432 or polidocanol (lauromacrogol)⁷⁻⁹. Surgical excision is effective but may result in bleeding, lip deformity, sensory disturbance, duct injury, or scarring². Laser therapy offers superior hemostasis and faster healing, although its use is limited by cost and equipment availability^{7,10}. A previous systematic review found no significant difference in recurrence among surgical excision, CO2 laser, and micro-marsupialization for oral mucocoeles⁷. More recently, a network meta-analysis compared seven treatment strategies for oral and plunging ranulas and found no statistically significant differences in recurrence rates¹¹. These findings underscore the ongoing lack of consensus regarding the optimal management of oral salivary extravasation lesions, reinforcing the rationale for conservative, reproducible approaches such as micro-marsupialization.

Micro-marsupialization, originally introduced for oral ranula by Morton and Bartley¹², creates epithelialized drainage tracts by passing sutures through the dome of the lesion. It offers a simple and minimally invasive approach^{4,10,13,14}. Technique refinements include performing multiple sutures passes with gentle to-and-fro motion to enlarge the drainage channels, as well as substituting synthetic absorbable sutures to eliminate the need for suture removal and improve patient comfort^{4,13}. In this context, there is a clear need to evaluate modified, minimally invasive approaches that preserve the advantages of micro-marsupialization while optimizing healing and patient experience. Moreover, the rationale for performing micro-marsupialization aligns with the realities of resource-limited healthcare settings¹⁴.

The aim of the present study was to evaluate a

modified micro-marsupialization technique employing a braided, absorbable, using braided, absorbable, synthetic polyglactin 910 (USP 0-0) sutures for the management of oral mucocoeles and ranulas, with emphasis on practicality, biocompatibility, and clinical healing characteristics as a conservative therapeutic alternative.

2. MATERIALS AND METHODS

This case series included individuals clinically diagnosed with oral mucocoeles or ranulas who had been treated using the micro-marsupialization technique. The study protocol was approved by the Research Ethics Committee of the Universidade Federal de Minas Gerais (No. 0311.0.203.000-10). Written informed consent was obtained from all participants or their legal guardians.

A convenience sample of patients were recruited from the Oral Medicine Service, School of Dentistry, Universidade Federal de Minas Gerais (Belo Horizonte, Brazil). Inclusion criteria comprised of a clinical diagnosis of oral mucocoele or ranula located on the lower lip or floor of the mouth, respectively. Clinically, these lesions were characterized as soft, smooth-surfaced, translucent, or bluish nodules with a sessile base and containing mucus. Exclusion criteria included lesions located on the palate or buccal mucosa, as well as cases with uncertain diagnosis or prior treatment.

Micro-marsupialization was performed according to the protocol reported by de Arruda *et al.*⁴ and Amaral *et al.*¹³ and with specific refinements applied in the present series. After topical anesthesia, a resorbable, braided (USP 0-0) polyglactin 910 suture (violet, round-bodied needle, 1/2; Shalon® Medical, Goiânia, Brazil) was passed through the dome of the lesion to create multiple transfixing tracts, enabling continuous mucus drainage. To-and-fro movements of the needle and gentle manual pressure with a dental suction tip were employed to enlarge the drainage pathways and evacuate the mucus content. No local infiltration anesthesia was required. Procedures were performed by two experienced oral medicine practitioners (J.A.A.A. and R.A.M.) to ensure technical consistency.

For postoperative care patients were instructed to maintain meticulous oral hygiene and to report any postoperative discomfort, edema, or bleeding. No antibiotics or anti-inflammatory drugs were routinely prescribed. Clinical follow-up was scheduled at 7, 21, and 30 days, and subsequently at intervals up to 109 months. Because the suture was absorbable, removal was unnecessary; complete absorption occurred within approximately 30-60 days.

Demographic (age, sex), clinical (site, size [mm]), and procedural variables (follow-up [months], recurrence, and patient satisfaction [0-10 scale]) were recorded for each case. Primary outcome measures included complete clinical healing and recurrence. Secondary outcomes were absence of complications (pain, edema, infection, or bleeding) and patient-

reported satisfaction with the procedure. The collected data was tabulated in Microsoft Office Excel 2019 (Microsoft® software, Redmond, WA, USA) and analyzed descriptively using GraphPad Prism software version 8.0.0 for Windows (GraphPad Software, San Diego, CA, USA).

All procedures involving human participants were conducted in accordance with the ethical standards of the Universidade Federal de Minas Gerais research committee, at which the study was conducted and received approval (No. 10723019.0.1001.5149).

3. RESULTS

Seven individuals composed the case series. Demographic, clinical, and outcome data are summarized in Table 1.

Table 1. Data and outcomes of individuals with oral mucocoeles and ranulas treated with micro-marsupialization technique with absorbable 0.0 suture thread.

Case	Sex and age (years)	Clinical diagnosis	Location	Size (mm)	Follow-up (months)	Recurrence	Satisfaction (0 to 10)
1	F, 5	Ranula	Floor of the mouth	10	100	No	10
2	F, 8	Ranula	Floor of the mouth	10	13	No	10
3	F, 12	Ranula	Floor of the mouth	10	5	No	10
4	F, 13	Ranula	Floor of the mouth	20	89	No	10
5	M, 57	Ranula	Floor of the mouth	8	100	No	10
6	M, 17	Mucocoele	Lower lip	8	102	No	10
7	M, 40	Mucocoele	Lower lip	5	109	No	10

F = Female; M = Male

The sample comprised four females and three males, with a mean age of 21.7 ± 17.9 years (range: 5–57). Five patients presented with ranulas involving the floor of the mouth, and two with mucocoeles located on the lower lip. Lesion size ranged from 5 to 20 mm (mean: 10.1 mm).



Figure 1. Management of a ranula in the floor of the mouth using the modified micro-marsupialization technique with 0-0 absorbable

suture. (A) Dome-shaped, translucent nodule on the right floor of the mouth, (B) measuring 1.0 cm. (C) Seven-day follow-up demonstrating multiple transfixing suture tracts allowing continuous mucus drainage. (D) Clinical healing and normal mucosal appearance at the 30-day follow-up.

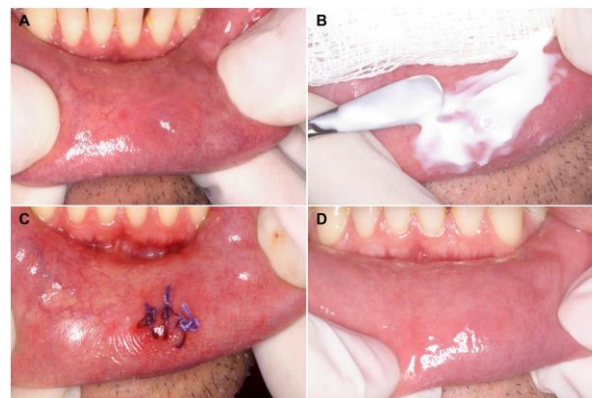


Figure 2. Management of a lower lip mucocoele using the modified micro-marsupialization technique with 0-0 absorbable suture. (A) Dome-shaped, translucent nodule on the lower lip. (B) Application of topical anesthetic before the procedure. (C) Immediate postoperative aspect showing multiple transfixing suture tracts with 0-0 absorbable suture to promote continuous mucus drainage. (D) Clinical healing and normal mucosal appearance at the 30-day follow-up.

Figure 1 and Figure 2 illustrate representative clinical cases of ranula and mucocoele, respectively, showing the initial appearance of the lesions, the micro-marsupialization process with absorbable USP 0-0 suture, and complete mucosal healing without recurrence. None of the patients experienced pain or discomfort during the procedure. All cases achieved complete clinical healing without recurrence during the follow-up period, which ranged from 5 to 109 months. No postoperative complications, such as pain, edema, bleeding, secondary infection, or need for retreatment, were observed. No plaque accumulation was observed around the sutures.

All patients reported maximum satisfaction (10/10) and described the procedure as comfortable and well tolerated.

4. DISCUSSION

Micro-marsupialization remains a conservative, reproducible, and well-tolerated treatment for oral mucocoeles and ranulas, particularly in pediatric populations. Over the past three decades, the technique has undergone refinements aimed at optimizing mucous drainage, promoting epithelial tract formation, and enhancing patient comfort^{4,12,13,15}. This technique also appears to represent a viable option for less experienced or early-career clinicians who are not extensively familiarized with surgical procedures. Apparently, this series is the first to demonstrate complete healing of oral mucocoeles and ranulas using micro-marsupialization with fine absorbable 0-0 sutures, showing no recurrences after a long-term follow-up and consistent patient satisfaction.

Several therapeutic strategies have been described for the management of oral mucocoeles and ranulas. For example, sublingual gland excision shows very low

recurrence rates in surgical series ($\approx 1\%$) but entails operative morbidity and greater resource demands and advanced technical skills^{8,16}. OK-432 (picibanil) sclerotherapy is an attractive option, although reports indicate variable recurrence rates and the need for multiple sessions¹⁷. Polidocanol has demonstrated favorable outcomes for minor-gland mucoceles, with high cure rates and minimal adverse effects¹⁸. Lauromacrogol (polidocanol) is emerging as a promising agent for mucocoele management, with early data suggesting cure rates around 92%⁹. Ethanol ablation for ranulas has shown recurrence rates of approximately 33%, often requiring re-intervention¹⁹. It is important to mention that randomized data remain lacking; however, a controlled clinical comparison found no significant difference between micro-marsupialization and excision for mucoceles, with comparable recurrence and fewer procedural demands in the micro-marsupialization group². On this basis, micro-marsupialization offers low cost, clinic-based feasibility, and excellent tolerability, particularly in resource-limited settings, as demonstrated by Elnager *et al.*¹⁴ in a Sudanese series that may also be applicable to Latin American contexts.

The rationale of micro-marsupialization relies on maintaining a controlled fistulization process that facilitates re-epithelialization of the ductal tract and prevents salivary stasis. Previous studies have shown that the suture material and gauge may influence both biological response and patient comfort. The original descriptions used 3-0 or 4-0 silk sutures, which are inexpensive and easy to handle but may induce local inflammation, promote plaque retention, and require removal that can cause anxiety^{2,12,13}. To overcome these drawbacks, absorbable synthetic sutures such as polyglycolic acid or polyglactin 910 were introduced to minimize biofilm retention and foreign-body reactions while eliminating the need for removal^{4,14,20,21}. Our working hypothesis, based on the use of a suture with a larger diameter than those applied in previous studies, which commonly employed 3-0⁴, is that a more robust material such as USP 0-0 suture better maintains tract patency for a sufficient period to allow complete epithelialization. The present findings suggest that a braided, coated suture such as polyglactin 910 not only preserves procedural efficacy and patient comfort but also provides greater tensile resistance due to its larger caliber compared to 3-0 and 4-0, thereby minimizing the need for reinterventions and reducing the risk of dehiscence.

Still, caution is warranted when performing micro-marsupialization. Very large or deep mucoceles may respond less favorably to this technique, potentially requiring adjunctive or alternative procedures⁷. This technique is not recommended for mucoceles located on the palate or buccal mucosa, since benign or malignant salivary gland tumors are more common in these sites, which may lead to clinical misdiagnosis²². Additionally, mucoceles and ranulas located beneath the tongue can be confused with other conditions (e.g.,

vascular anomalies, developmental cysts, or benign and malignant mesenchymal tumors)³. Like our previous series using 3-0 polyglycolic acid sutures, no postoperative complications such as pain, edema, secondary infection, bleeding, or need for retreatment were observed. However, a slight accumulation of plaque was noted around the suture thread, without signs of inflammation⁴. The present study included small lesions ranging from 5 to 20 mm; therefore, extrapolation to large plunging lesions should be approached with caution. These nuances underscore the importance of well-defined selection criteria that take into account patient age, lesion size, depth, and site, as well as structured algorithms that reserve more invasive modalities (e.g., transoral sublingual gland excision) for complex ranulas or treatment failures²³.

Compared with earlier absorbable-suture studies, our 0-0-gauge modified technique maintained effectiveness with no recurrence and maximal patient comfort throughout the longest follow-up in our context (up to 109 months), consistent with reports indicating that micro-marsupialization is effective, well-tolerated, and particularly suitable for pediatric dentistry^{20,24,25}. Its single-visit, clinic-based delivery, and the absence of suture removal are in agreement with previous series employing synthetic absorbable sutures to minimize biofilm retention and postoperative burden⁴. Head-to-head clinical comparisons have also shown no inferiority to surgical excision in terms of healing and recurrence, while imposing fewer procedural demands². These convergent data support the scalability of the technique to primary-care or school-based programs, as well as to resource-limited settings where access to operating rooms, high-power lasers, or general anesthesia is restricted, and extend prior evidence by suggesting that finer or thicker absorbable calibers can be used without compromising outcomes.

Limitations of the present study include the small sample size, absence of a comparator arm, and reliance on clinical (non-histologic) diagnosis, which is typical for classic oral mucoceles and ranulas. Pain and quality-of-life outcomes were not standardized beyond the satisfaction score. Future studies should include prospective comparative designs testing different suture materials (absorbable versus silk) and, for ranulas, stratification by simple versus plunging types with imaging endpoints. Given the low-to-very-low certainty across current comparative evidence¹¹, pragmatic multicenter trials are both feasible and urgently needed. Despite these shortcomings, our series provides a new perspective for clinicians and oral surgeons, demonstrating that the 0-0 suture is easy to use, safe, and associated with no recurrences.

5. CONCLUSION

In summary, micro-marsupialization using 0-0 absorbable polyglactin 910 sutures achieved consistent, complication-free healing of oral mucoceles and ranulas, with durable long-term outcomes and high

patient satisfaction. The technique is practical, easy to perform, and biocompatible, eliminates the need for suture removal, and supports its role as a conservative first-line option, particularly for children and in resource-limited settings.

6. FUNDING AND ACKNOWLEDGMENTS

The authors declare that that they have no conflict of interest and this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

The authors thank the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Finance Code 001; recipient: V.Z.D.) and the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for supporting L.G.A. (305544/2022-5), B.A.B.A. (302627/2022-7), and R.A.M. (312830/2022-0) as research fellows. Fellowships were also provided by the Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro (FAPERJ) to B.A.B.A. (E-26/201.289/2022) and J.A.A.A. (E-26/200.330/2024; E-26/200.331/2024).

7. REFERENCES

- [1] Miranda GGB, Chaves-Junior SC, Lopes MP, *et al.* Oral mucocles: a Brazilian multicenter study of 1,901 cases. *Braz Dent J.* 2022; 33:81-90.
- [2] Girardi GB, Saifi AM. Micro-marsupialization versus surgical excision for the treatment of mucocles. *Ann Maxillofac Surg.* 2016; 6:204-209.
- [3] Bowers EMR, Schaitkin B. Management of mucocles, sialocles, and ranulas. *Otolaryngol Clin North Am.* 2021; 54:543-551.
- [4] de Arruda JAA, Jácome-Santos H, Kato CNAO, *et al.* Micro-marsupialization technique with suture thread modification for improving the management of oral mucocles and ranulas: a case series. *Oral Surg.* 2021; 14:241-245.
- [5] More CB, Bhavsar K, Varma S, *et al.* Oral mucocle: a clinical and histopathological study. *J Oral Maxillofac Pathol.* 2014; 18:S72-77.
- [6] Silva LVO, Arruda JAA, Martelli SJ, *et al.* A multicenter study of biopsied oral and maxillofacial lesions in a Brazilian pediatric population. *Braz Oral Res.* 2018; 32:e20.
- [7] Hashemi M, Zohdi M, Zakeri E, *et al.* Comparison of the recurrence rate of different surgical techniques for oral mucocle: a systematic review and meta-analysis. *Med Oral Patol Oral Cir Bucal.* 2023; 28:e614-e621.
- [8] Gontarz M, Bargiel J, Gąsiorowski K, *et al.* Surgical treatment of sublingual gland ranulas. *Int Arch Otorhinolaryngol.* 2022; 27:e296-e301.
- [9] Wu Q, Zhao J, Zhong H. Intralesional injection of laurumacrogol in mucocles: An efficacy controlled clinical trial. *J Craniomaxillofac Surg.* 2025; 53:921-926.
- [10] Amaral MB, Freitas IZ, Pretel H, *et al.* Low level laser effect after micro-marsupialization technique in treating ranulas and mucocles: a case series report. *Lasers Med Sci.* 2012; 27:1251-1255.
- [11] Souza MRF, Gonçalves MWA, Martins-Chaves RR, *et al.* Treatments to avoid ranula recurrence: a network meta-analysis. *J Oral Pathol Med.* 2025.
- [12] Morton RP, Bartley JR. Simple sublingual ranulas: pathogenesis and management. *J Otolaryngol.* 1995; 24:253-254.
- [13] Amaral MB, de Freitas JB, Mesquita RA. Upgrading of the micro-marsupialisation technique for the management of mucus extravasation or retention phenomena. *Int J Oral Maxillofac Surg.* 2012; 41:1527-1531.
- [14] Elnager M, Udeabor SE, Elfadeel ASA, *et al.* Modified micromarsupialization technique as an alternative primary treatment for ranulas: a case series in a resource-challenged economy. *Clin Exp Dent Res.* 2022; 8:1434-1439.
- [15] Sandrini FA, Sant'ana-Filho M, Rados PV. Ranula management: suggested modifications in the micro-marsupialization technique. *J Oral Maxillofac Surg.* 2007; 65:1436-1438.
- [16] Arunachalam P, Priyadharshini N. Recurrent plunging ranula. *J Indian Assoc Pediatr Surg.* 2010; 15:36-38.
- [17] Rho MH, Kim DW, Kwon JS, *et al.* OK-432 sclerotherapy of plunging ranula in 21 patients: it can be a substitute for surgery. *AJNR Am J Neuroradiol.* 2006; 27:1090-1095.
- [18] Liu JL, Zhang AQ, Jiang LC, *et al.* The efficacy of polidocanol sclerotherapy in mucocle of the minor salivary gland. *J Oral Pathol Med.* 2018; 47:895-899.
- [19] Suh PS, Lee JH, Roh YH, *et al.* Ethanol ablation of ranulas and risk factor analysis for recurrence. *JAMA Otolaryngol Head Neck Surg.* 2024; 150:502-508.
- [20] Verro B, Mauceri R, Campisi G, *et al.* Ranula: modified micro-marsupialization: case report and review of literature. *Iran J Otorhinolaryngol.* 2023; 35:113-117.
- [21] Aluko-Olokun B, Olaitan AA. Ranula decompression using stitch and stab method: the Aluko technique. *J Maxillofac Oral Surg.* 2017; 16:192-196.
- [22] Mariz BALA, do Socorro Queiroz Feio P, Roza ALOC, *et al.* Clinical predictors of malignancy in palatal salivary gland tumors. *Oral Dis.* 2019; 25:1919-1924.
- [23] Roh JL. Transoral complete vs partial excision of the sublingual gland for plunging ranula. *Otolaryngol Head Neck Surg.* 2022; 167:479-483.
- [24] Piazzetta CM, Torres-Pereira C, Amenábar JM. Micro-marsupialization as an alternative treatment for mucocle in pediatric dentistry. *Int J Paediatr Dent.* 2012; 22:318-323.
- [25] Matondkar SP, Yavagal C, Mandroli PS. Modified micro-marsupialization as an alternative treatment for the management of ranulas in children. *Natl J Maxillofac Surg.* 2019; 10:95-97.