

Surgical Management of Ranula- Floor of Mouth by Marsupialization: A Case Series.

Amjad Shaikh^{1*}, Ishrat Fatema², Vijay Deshmukh³, Mohd Mudassir Shaikh⁴, Jawwad Syed⁵

¹Associate Professor, Department Of Dentistry, JIIU'S Indian Institute of Medical Sciences and Research, Jalna, Maharashtra

²Professor, Dept. Of Obstetrics and gynaecology, JIIU's Indian Institute of Medical Sciences & Research, Jalna, Maharashtra

³Professor, Department Of Dentistry, JIIU'S Indian Institute of Medical Sciences and Research

⁴Associate Professor, Department Of Anaesthesia, JIIU'S Indian Institute of Medical Sciences and Research

⁵Associate Professor, Dept of Preventive and Social Medicine, JIIU'S Indian Institute of Medical Sciences

*Corresponding Author:

Amjad Shaikh, Associate Professor, Department Of Dentistry, JIIU'S Indian Institute of Medical Sciences and Research, Jalna, Maharashtra

E-MAIL: drshaikhamjad@gmail.com

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ABSTRACT

Introduction: The extravasation of saliva from the sublingual gland on the floor of the mouth results in a ranula. The most typical presentation is swelling under the tongue. The mylohyoid muscle may allow it to herniate, causing a plunging ranula. Ranula can be treated in many ways, including ranula excision alone, excision of the sublingual gland with or without ranula, aspiration of cystic fluid, sclerotherapy, marsupialization, incision and drainage.

Material and methods: This case study includes six patients with ranula who underwent surgical treatment by marsupialization. The indications, age and sex distribution, Marsupialization methods, pathology reports, recurrence rates, and complications were seen.

Results: Out of 6 patients in our case series, no one patient has shown to be any recurrence or complications of marsupialization.

Conclusions: Management of Ranula by Marsupialization is a good option, but if it recurs after marsupialization, Excision of the lesion and the affected gland is the best course of action.

KEYWORDS: Ranula marsupialization, Sublingual Gland, Floor of Mouth

INTRODUCTION

The name ranula comes from the Latin word Rana, which means frog, and refers to a blue transparent swelling on the floor of the mouth that resembles a frog's underbelly. Ranula can be visible at any age, from infancy to death. Young adults are frequently affected.^[1] Bilateral ranulas are exceedingly uncommon. Extravasation of mucus from the sublingual gland or

occlusion of the ducts causes ranula to form. At any age, a ranula can appear. It has been seen in people aged 2 to 61, with a slight female predominance.^[2]

Excretory duct rupture, followed by extravasation and deposition of saliva in the surrounding tissue, resulting in a ranula development. A pseudocyst is a cyst that lacks an epithelial lining due to the deposition of mucus in the surrounding connective tissue, and a ranula behaves like a pseudocyst.^[3] Saliva examination showed a high quantity of protein and amylase, compatible with secretions from the sublingual gland's mucinous acini.^[4] Because of the high protein concentration, pseudocyst development may be mediated by an intense inflammatory response. A blue-domed, transparent swelling on the floor of the mouth is the typical ranula.^[5]

The prevalence of ranula is about 0.2 out of every 1000 people and makes up about 6% of all oral sialo cysts. True retention cysts make up only 1% to 10% of all ranulas. Children and young adults are the most common victims of ranula. In the second decade of life, the frequency of ranula peaks.^[6]

Marsupialization is often accomplished by cutting a slit and sewing the margins together so that a cyst's outer epithelium and internal epithelium become one.^[7] As long as the cut stays open, this assures continual drainage. Having a few different ways to perform a task is a good idea.^[8] Developing simpler means of reaching a surgical aim is much more useful. Surgical treatments and techniques are constantly evolving to improve success rates.^[9]

METHODS AND OBSERVATIONS

Clinical Presentation of Cases: (Clinical Findings and Diagnostic assessment):

A summary of the six-case series is shown in Table 1. Demographic data and medical, surgical, and family histories were recorded. Magnetic resonance imaging MRI or CT could not be performed due to financial constraints; radiographs showed no involvement of the hard tissues. Diagnosis of ranula was made based on the clinical and ultrasound reports.

Therapeutic intervention & Outcome:

Marsupialization of the ranula was performed in all cases, followed by iodoform dressing for one week. The accumulated saliva collection was evacuated during the surgery for all the cases. A postoperative histopathologic report in all cases is consistent with an extravasated ranula. Patients are being followed up but with no sign of recurrence so far Figures 1, 2 and 3

Case 1

Growth under the tongue was discovered in a seven-year-old girl Since from eight months. They expanded to the size of a ball, starting as pea seeds. Swallowing and speaking problems are common complaints among patients. A swelling on the Lt floor of the mouth measuring $3 \times 2 \text{ cm}^2$, which was soft, non-painful, and blue on intraoral clinical examination. Following mass aspiration, an inspection revealed a clear, condensed liquid in the mass. The patient underwent a marsupialization surgery performed under general anaesthetic, with a 2-cm incision made above the surface of the mass solely on the mucosa that was immediately delimited by the capsule mass. After that, the operative region was sutured, and the entire mass of the opening was packed with iodoform gauze. Patients were directed to follow a soft diet after surgery. Iodoform dressing was to be monitored for one week after surgery.

Case 2

A ten-year-old girl arrived with a three-month-long painless swelling in the left submandibular area, as well as swelling in the floor of mouth, which hampered her speech. Fluctuating swelling on the floor of the mouth that is well-circumscribed and measures $3.5 \times 2 \times 2 \text{ cm}^3$ raises her tongue. A sublingual soft mass elevates the tongue with a blue tint and thick overlying mucosa. Plunging ranula is a positive. A sticky straw-coloured fluid was aspirated from both the oral and cervical swellings. Also, it was a ranula based on the inspection findings; thus, a Local anaesthetic was used to execute marsupialization. The procedure site was disinfected, and a vasoconstrictor was injected before the surgery. A 2 cm incision was also made over the mass's surface, but only on the mucosa directly delimited by the

mass's capsule. The operative region was sutured after all the bulk fluid had been evacuated, and a cavity was replaced with iodoform gauze. A soft diet was advised, and after one-week of postoperative, the iodoform dressing was removed.



Figure 1: 10-year-old girl with ranula Lt Floor of mouth ranula

Case 3

A 39-year-old female patient with swelling in the left sublingual area was sent to our department. The lesion began in the sublingual salivary gland and spread to the floor of the mouth. The swelling has increased in recent months, according to the patient. A USG scan revealed a cystic lesion on the left side of the neck that included the sublingual region. On inspection, the lesion measured around $3 \times 4 \times 4 \text{ cm}^3$ in diameter and the ranula was diagnosed provisionally. Thus, General anaesthesia was used to execute marsupialization. The procedure site was disinfected, and a vasoconstrictor was injected before the surgery. A 2 cm incision was also made over the mass's surface, but only on the mucosa directly delimited by the mass's capsule. The operative region was sutured after the bulk fluid had been evacuated and replaced with an iodoform gauze Pack. A soft diet was advised to a patient, and after one-week postoperative iodoform, dressing was replaced with the same. The roof of the Ranula tissue was histopathologically examined and it was consistent with the ranula.

Case	Age (years)	Sex	Presentation	Clinical features	Recurrence	Follow-up
1	7	F	Painless left submandibular and floor of mouth mass of 8-month duration Figure 1 . Associated with difficulty in Feeding	Diffused, soft to fluctuant and non-tender mass 3 cm by 2 cm on the Lt floor of mouth, with raised tongues	No	3 years
2	10	F	Painless swelling on Lt submandibular region of 3-month duration	Diffused, soft, fluctuant and nontender swelling measures; 3.5×2 cm ²	No	6 months
3	39	F	Lt Painless swelling on the floor of mouth since from 3 months	Well-circumscribed, fluctuant swelling on floor of mouth, 3 cm by 4 cm in size. Tongue is raised.	No	4 months
4	11	F	3-month duration painless swelling in left submandibular region accompanied by the floor of Mouth swelling with excessive salivation.	Lt side located submandibular a soft mass, a bluish hue and thick overlying mucosa, elevating the tongue	No	6 months
5	7	M	Fifteen days duration in Rt sublingual region swelling. That is non-painful and non-tender	3×2×2 cm ³ diameter bluish-colored swelling in Rt sublingual region	No	16 month
6	29	F	Affected speech, swelling in Rt floor of the mouth, which is a 1-month duration	4×2×2 cm ³ diameter bluish-colored swelling in Rt floor of the mouth region	No	12 month

F= Female, M= Male

Table 1: Details of Cases

DISCUSSION

The first step in the formation of a ranula is a traumatic rupture of the excretory duct, followed by saliva extravasation and collection inside the tissue. Swelling of the neck is caused by one of four processes in plunging and sublingual-plunging ranulas. To begin with, a sublingual gland may protrude through the mylohyoid muscle, or an ectopic salivary gland may exist on the cervical side of the mylohyoid. Plunging ranulas without intraoral components can be explained by this process. [10]

Mucus production from these ectopic glands may drain saliva straight into the neck mass, according to Visscher et al. (1989). The mylohyoid muscle may also develop a hiatus or dehiscence. The submental artery, lymph vessels, and branches of the sublingual artery and vein all flow through a hole in the mylohyoid muscle, according to anatomical research. The lateral aspect of the muscle's anterior two-thirds shows this deficiency. [11] The mucus from the sublingual gland might leak into the submandibular region through this hole. In 45 per cent of cadaver specimens, the sublingual gland protruded through the gap between the anterior and posterior parts of the mylohyoid muscle, indicating that this herniation is involved in ranulas cervical

extensions. [12]

As a result, the ranula can go under the mylohyoid muscle and reach the neck. An abnormal duct from the deep lobe of the sublingual gland, according to Patton, might open into the submandibular duct. This aberrant connection may induce a blockage in the duct, resulting in saliva extravasation into the submandibular area of the neck (Visscher et al., 1989) [13] However, no one knows what causes ranula in new-borns. Trauma to the salivary duct is linked to it in older children. Congenital sialocoele, a genuine cyst with epithelial lining, can result when the duct orifice is not patent. The failure of canalization of the duct's terminal end is assumed to be congenital (Simba et al., 2011). [6]

Simple marsupialization, the oldest and most commonly described surgical approach for treating oral ranula, has fallen out of favour, due to a high rate of failure. According to the literature, the failure rate ranges from 6% to 89%, with clinical signs of recurrence showing anywhere between 6 weeks and 12 months. [3]

The ranula was to be marsupialized under local anaesthetic, which was the suggested therapy. The membrane that covers the injury was ruptured during surgery, and all mucus contained inside it was expelled, and the everted



Figure 2: Marsupialization of ranula with lining sutured with mucosa

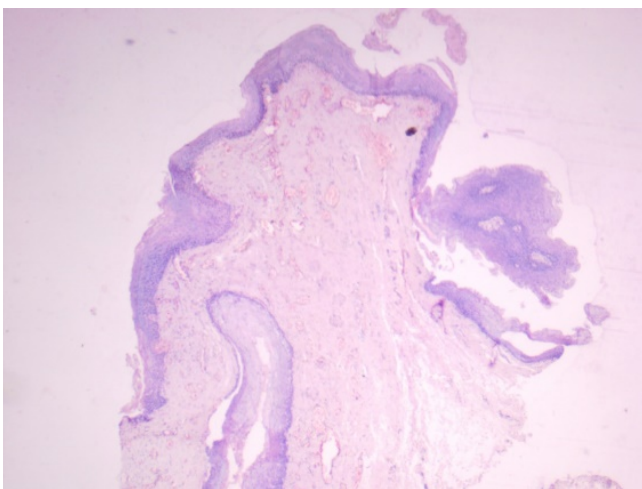


Figure 3: Histopathology of Ranula showing squamous epithelium

edges were sutured. The suture points were held in place until the stitch dissolved completely. ^[14] One year after the surgical treatment, the patient is seen in ambulating accompaniment with no signs of harm returning. Because of the tight area and the movement of the tongue and the floor of the mouth during traditional marsupialization, the wound borders tend to touch each other. As a result, the lesion has a proclivity towards reformation. ^[15]

Ranula development has also been linked to surgical procedures. There have been accounts of plunging ranulas that appeared following the removal of a sialolith or the transposition of the submandibular gland's duct. ^[16] As a result, Crysdale et al. advocated that an oral ranula bigger than 1 cm be treated by removing the offending sublingual gland; however, other authors suggested that this therapy can be performed regardless of the size of the lesion. After marsupialization, they discovered a recurrence rate of 66.67%. As a result, this method has only been utilized in our department when the lesion is superficial, and the patient's overall health is poor. ^[17]

Instead of leaving the pseudo cystic hole exposed following the unroofing surgery, Baurmash modified marsupialization by determining the full depth of the cavity and tightly sealing it with gauze. The packing is left on for 7 to 10 days to allow it to exfoliate naturally. He marsupialized 12 patients, with just one failure necessitating sublingual gland excision. As a result, he advised to treat oral ranulas with marsupialization and packing, followed by excising the offending sublingual gland if recurrence occurs. ^[18]

CONCLUSION

Although some surgeons still favour marsupialization as the first line of treatment for ranulas, this may be due to the less potential surgical complications. As the removal of the sublingual gland is associated with injury to the lingual nerve, damage to the Wharton's duct, which is associated with stenosis causing obstructive sialadenitis, and ductal injury leading to salivary leakage. We employed marsupialization as the main treatment for oral ranulas, which reduced lingual nerve injury and bleeding/hematoma compared to ranula excision with the sublingual gland.

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REFERENCES

1. Suresh K, Feng AL, Varvares MA. Plunging ranula with lingual nerve tether: Case report and literature review. *Am J Otolaryngol.* 2019;40(4):612–616.

2. Velankar HK, Dabholkar YG, Dawat N. A large plunging ranula causing sleep apnoea: a case report. *Int J Health Sci Res.* 2014;4(5):301–304.
3. Arunachalam P, Priyadharshini N. Recurrent plunging ranula. *J Indian Assoc Pediatr Surg.* 2010;15:36–44.
4. Mahadevan M, Vasan N. Management of paediatric plunging ranula. *Int J Paediatr Otorhinolaryngol.* 2006;70(6):1049–54.
5. Verma G, Sheikhi M, Jalalian F, Rashidipoor R, Mosavat F. Plunging ranula of the submandibular area. *Arch CranOroFac Sci.* 2011;1(3):114–118.
6. Soni A, Suyal P, Suyal A. Congenital ranula in a newborn: a rare presentation. *Ind J Otolaryngol Head Neck Surg.* 2012;64(3):295–297.
7. Sagari SK, Vamsi KC, Shah D, Singh V, Patil GB, Saawarn S. Micro-marsupialization: a minimally invasive technique for mucocele in children and adolescents. *J Ind Soc Pedod Prev Dent.* 2012;30:188–191.
8. Lovrencic-Huzjan A, Rundek T, Katsnelson M. Recommendations for the management of patients with carotid stenosis. *Stroke Research and Treatment Article ID.* 2012;p. 175869–175869.
9. Zhao YF, Jia Y, Chen XM, Zhang WF. Clinical review of 580 ranulas. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2004;98(3):281–287.
10. Yadav R, Tewari V, Ranula. Its Etiopathogenesis and Management. A Systematic Review *ENT-Updates.* 2021;11(1):56–61.
11. Kumar M, Gulivindala D. A case report of ranula treated with marsupialization and low-level laser therapy. *Int J Sci Res Publ.* 2014;4(10):1–3.
12. Olojede A, Ogundana OM, Emeka CI, Adewole RA, Emmanuel MM, Gbotolorun OM et al. *PMCID ;* 2017,.
13. Kurabayashi T, Ida M, Yasumoto M, Ohbayashi N, Yoshino N, Tetsumura A et al. Gupta A, Karjodkar FR Plunging ranula: a case report. 2000;42:917–939.
14. Patel MR, Deal AM, Shockley WW. Oral and plunging ranulas: What is the most effective treatment? *Laryngoscope.* PMID. 2009;119(8):4455536–4455536.
15. Sahoo R, Sahoo P, Mohapatra D, Subudhi S. Two concurrent large epidermoid cysts in sublingual and submental region resembling plunging ranula: report of a rare case. *Ann Maxillofac Surg.* 2017;7:155–158.
16. Kogo LS, Tominaga M, Matsuya G, T. Plunging ranula as a complication of intraoral removal of a submandibular sialolith. *Br J Oral Maxillofac Surg.* 2001;39:214–216.
17. Sigismund P, Bozzato A, Schumann M, Koch M, Iro H, Zenk J. Management of ranula: 9 years clinical experience in pediatric and adult patients. *J Oral Maxillo Surg.* 2013;71:538–544.
18. Baurmash HD. A case against sublingual gland removal as primary treatment of ranulas. *J Oral Maxillofac Surg.* 2007;65:117–121.

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