

**Modified Micro-marsupialization of Sublingual Ranula in a Pediatric Patient - A Case Report**

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**Abstract**

A ranula is a mucus filled cavity that occurs in the floor of the mouth characterized by a painless blue translucent swelling. A large sized ranula may cause discomfort in swallowing, speech and mastication. Surgical techniques like excision of the sublingual gland, excision of both the ranula and the sublingual gland have been fraught with complications. Conservative approaches like marsupialization/micro-marsupialization too were preferred methods but did not exclude the chance for recurrence. This is a case report of modified micro-marsupialization of a sublingual ranula in a pediatric patient that yielded favourable results without any recurrence.

**Keywords:** Ranula, Marsupialization, Micro-marsupialization, Modified micro-marsupialization

**Introduction**

The term ranula was derived from the Latin word rana, meaning frog, denoting its resemblance to a bulging frog’s underbelly.<sup>[1]</sup> Ranulas are characteristically large (>2 cm) and appear as tense fluctuant dome-shaped vesicles, sometimes with a blue hue. The most common site is the floor of the oral cavity. The origin of ranula is either from the body of the sublingual gland, or from the ducts of Rivinus or rarely, from the local minor salivary glands.<sup>[2]</sup>

A variety of surgical procedures ranging from simple aspiration to complete or partial excision of the ranula and/or the sublingual salivary gland, at times also

involving the submandibular salivary gland have been advocated in ranula management.<sup>[3]</sup> Removing the offending salivary gland is considered as a definitive treatment. But there is a high risk of injury to the lingual nerve and submandibular duct while conducting the surgery.<sup>[4]</sup>

Hence, conservative treatment methods like marsupialization, micro-marsupialization and modified micro-marsupialization are preferred, especially amongst the pediatric population.

### Case Report

A 12-year-old female child reported to the Department of Pediatric and Preventive Dentistry of Government Dental College, Thiruvananthapuram with the chief complaint of a swelling with respect to the right side of the floor of the mouth since 15 days. The child noticed a small swelling in the region two weeks ago that gradually progressed to its current size. No abrupt changes in size of the swelling were noticed by the child during meals or otherwise. There was no history of trauma, infection or any known precipitating factors. She also gave a history of discomfort during speech and swallowing. There was no history of fever or discharge from the site of the swelling. Medical history was not significant.

Intraoral examination revealed a single, large, oval-shaped swelling on the right side of the ventral surface of the tongue, measuring approximately 5cm×4cm in size, with visible capillaries on the surface. On palpation the swelling was non tender, cystic, fluctuant and soft in consistency. No secondary changes such as ulceration, fistula formation, infection or discharge were observed and the lymph nodes were not enlarged. A provisional diagnosis of sublingual ranula was made in the case and a conservative approach of modified micro-marsupialization was planned.

After routine pre-operative investigations, the area was disinfected with 0.1% povidone iodine solution. Lingual nerve block of the right side was administered to anaesthetize the area. Multiple interrupted sutures were made with the 2-0 silk through the widest diameter of the lesion, taking care not to reach the underlying tissue. Such multiple sutures were placed all over the mucosa which provided vents for complete draining of the contents. Postoperatively, the patient was instructed to maintain strict oral hygiene measures especially to keep the suture area clean and unclogged without any food particles to allow proper drainage and to rinse with warm saline for a minimum of three times during the day. Sutures were then removed after 7 days. The ranula was completely drained. A follow up of the patient after one month, three months and six months showed a normal picture of the ventral surface of the tongue, and the patient remains asymptomatic since the procedure.



Fig.1: Preoperative



Fig.2: Intraoperative (modified micro-marsupialization)



Fig.3: Postoperative (After 30 days follow up)

### Discussion

Of all oral sialocysts, ranulas comprise 6% and commonly the peak of incidence is seen in the second decade of life. Even though the prevalence is 0.2/1000 cases, less than 10% are true cysts.<sup>[5]</sup> The diagnosis of a ranula is mostly clinical.<sup>[6]</sup> Inflammatory and neoplastic lesions of the sublingual and submandibular glands, cystic hygroma, branchial or thyroglossal duct cysts, laryngocele, dermoid cysts, and epidermoid cysts might be included among the differential diagnosis.<sup>[7]</sup>

One school of thought regarding the development states that ranulas develop as a result of mucus extravasation, whereas another supports mucus retention, both as a result

of rupture or damage of the duct of sublingual gland. However, current consensus is in favour of mucus extravasation because ranulas are mostly devoid of lining epithelium.<sup>[8]</sup>

The three clinical types of ranula include the Sublingual ranula, which is the most common, which presents as an intraoral sublingual swelling, the Plunging ranula being the second most common, which is located cervically and extends beyond the mylohyoid muscle and that having both cervical and oral components is the Sublingual plunging ranula.<sup>[9]</sup>

The diagnosis may be made based on the clinical presentation, but fine-needle aspiration cytology (FNAC), computed tomography (CT), ultrasonography, and MRI have also been used for differential diagnosis. A radiolucent “tail sign” in contrast-enhanced CT scanning is a characteristic feature of the plunging ranula.<sup>[10]</sup> Jain et al. recommended an ultrasonography for pediatric ranulas, as it does not necessitate sedation or radiation exposure.<sup>[11]</sup> For the plunging ranula, an MRI provides more accurate localization of the mass in any plane than ultrasonography. FNAC can also provide a definite diagnosis by the presence of yellow aspirate, positive for amylase and mucin.<sup>[12]</sup>

Absence of epithelial tissues in the walls is an important feature in histologic diagnosis of the ranula.<sup>[13]</sup> A cystic wall biopsy helps to rule out the presence of squamous cell carcinoma arising from the cyst wall and papillary cystadenocarcinoma of the sublingual gland.<sup>[7]</sup>

What is challenging is that they have a high chance of recurrence, and that the modality of complete excision with removal of the sublingual gland has many complications and difficulties.<sup>[1]</sup> Marsupialization is a procedure wherein cyst is incised and the edges of the following slit are sutured to form a continuous surface from the exterior to the interior of the cyst. Morton and

Bartley modified the conventional marsupialization approach in 1995, in which they placed a single silk suture at the dome of the ranula.<sup>[14]</sup>

Later on, Delbem et al. utilized the technique of micro-marsupialization which involves topical anesthesia of the lesion for 3 minutes and use of a single 4-0 black silk suture passed through the internal part of the lesion along its widest diameter. The suture was removed after 7 days.<sup>[14]</sup>

Sandrini et al. in 2007, suggested modifications to the micro-marsupialisation procedure such as to increase the number of sutures, decrease the distance between entry and exit of needle and longer period of maintenance of sutures (30 days). Caution was also needed while tying the suture knot so as to not cause any hindrance to the blood flow which could potentially lead to tissue necrosis. The main principle for allowing the silk sutures stay for an extended period is for the development of new, permanent epithelialized tracts for the release of the retained secretions. Sandrini et al. suggested that the sutures be maintained for 30 days, but further studies have shown that keeping sutures for such long periods in children will be a cause of discomfort and infection because of suboptimal oral hygiene.<sup>[15]</sup>

In a study by Delbem et al., out of the 14 patients treated by micro-marsupialisation, 12 patients presented with full regression of mucoceles (recurrence rate of 14.2%).<sup>[16]</sup>

According to a study by Bansal et al., none of the patients treated with modified micro-marsupialization had recurrence compared to micro-marsupialization group, which had 26.7% recurrence. Though it was not histologically verified, multiple epithelized channels created due to multiple sutures probably might be the reason for this. Premature loss of the suture may occur, however, due to multiple sutures in modified micro-marsupialization, replacement of the suture is not

required. But in micro-marsupialization, resuturing is required if the suture is lost before 7 days.<sup>[17]</sup>

Among the nonsurgical methods, cryosurgery has many advantages like simplicity, relative painlessness and low incidence of secondary infection, hemorrhage and recurrence. The recently introduced carbon dioxide (CO<sub>2</sub>) laser offers a wide range of advantages which include rapid and simple mucocele ablation, short surgical time and minimum complications.<sup>[18]</sup> CO<sub>2</sub> laser and Cr: YSG laser has also been used to vaporize ranulas. Intracystic injection of sclerotherapy agents like OK-432, Bleomycin and Botulinum Toxin Type-A has been reported to be effective.<sup>[19]</sup>

Micro-marsupialization can be performed without expensive equipments and it also avoids the use of irritant drugs. In the present case, modified micro-marsupialization yielded good results without any recurrence. Postoperative period was also uneventful with a proper healing at the end of three weeks. However, maintenance of proper oral hygiene measures especially around the multiple sutures might be important to allow drainage and to prevent recurrence.

### **Conclusion**

Modified micro-marsupialization could be employed as a simple and convenient method with a shorter healing period, shorter surgical time, minimal postoperative complications, and is especially advantageous in the management of ranulas among pediatric patients.

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