CASE REPORT

**SUBLINGUAL PLUNGING RANULA: A CASE REPORT**

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**ABSTRACT**

Ranulas are uncommon cystic lesions resulting from damage or rupture of one or more of the ducts of the sublingual gland, results to mucus extravasation or dilatation of the gland’s duct. This paper reports the management of a sublingual-plunging ranula in a 12 year old female child.

**Keywords:** Ranula; Plunging Ranula; Retention Cyst; Extravasation Cyst; Sublingual Gland

**Introduction**

Ranulas are rare cystic lesions resulting from damage or rupture of one or more of the ducts of the sublingual gland, that lead to mucus extravasation or dilatation of the gland’s duct. Extravasation cysts are more common than retention cysts. Ranulas are originating mainly from the sublingual gland and rarely from the submandibular gland. They often protrude into the floor of the mouth, having only an oral component. Ranulas that are located beyond the mylohyoid muscle, termed “plunging ranulas” and those possessing both an oral and a cervical component, called “sublingual-plunging ranulas”, are very rare compared to sublingual ones. This paper reports the management of a sublingual-plunging ranula in a 12-year-old female child.

**Case Report**

A 12 years old female child patient reported to our department of Oral Surgery with a chief complaint of swelling over the left side of face along with difficulty in swallowing because of raised tongue. The history dates to 6 months back, when the patient first noticed a swelling in the floor of mouth. Initially the swelling was presented only in the floor of mouth which subsequently enlarged to appear on face in submandibular and submental region. The swelling was asymptomatic and increased slowly over a period of time with a history of intermittent change in its size. No surgical intervention was done for the condition and was being managed by medications alone. There was no improvement at all and the patient experienced difficulty in swallowing since last few days. Therefore, the patient visited our institution for definitive management.

On extraoral examination, a diffuse, soft, fluctuant, non tender swelling, about 7 × 5 cm in size, was present in left submental and submandibular region with no fixation to overlying skin and underlying structures. The overlying skin was normal in texture, slightly tensed with normal temperature. No sign of bruit evident. Intra orally a diffuse swelling was present, involving the floor of mouth in sublingual region on left side extending posteriorly up to deciduous molars. The tongue was raised causing definite difficulty in swallowing (Figure 1). Oral hygiene was fair with the presenting dentition in good health. No dental etiology was evident as the cause of the swelling. Aspiration of the swelling was done both extraorally and intraorally to evacuate the contents of the swelling. On aspiration approximately 20 cc of mucous secretion was aspirated. A provisional diagnosis of ranula was made with a differential diagnosis of dermoid and epidermoid cyst, thyroglossal duct cyst, cystic hygroma, and lymphadenopathy. A CT scan was advised to see the extent of the lesion. The 2-D CT scan of the swelling revealed a well defined cystic lesion in relation to floor of mouth on left side measuring approximately 58 × 28 × 37 mm in size with no evidence of calcification or septation. There was displacement of genioglossus muscle towards right (Figure 2).

Based on the clinical presentation and CT scan findings a definite diagnosis of sublingual-plunging ranula was made. The surgery was deferred because of upper respiratory tract infection. She was advised medication for the same and after

Figure 1. Intraoral massive swelling evident with marked elevation of tongue, Figure 2. CT-scan of the patient showing well defined radiolucent cystic lesion, Figure 3. Ranula along with sublingual gland lifted away from the underlying structures, Figure 4. Salivary gland acini with diffused inflammatory infiltrate along with traces of hemorrhage (Hematoxyline-eosin stain; magnification X40).
4 weeks she was assessed again for surgical intervention. On preoperative assessment, patient presented with mild fever, tachycardia and laboratory investigation revealed increased WBC count. Systematic evaluation of patient ruled out any systemic factor, with infection of cystic cavity as the probable cause. After symptomatic management, the patient was taken up for the surgical procedure at a later date.

Surgical Procedure
The excision of the lesion along with sublingual gland was done through a transcutaneous incision in submental triangle under general anesthesia. This access allowed removal of the ranula directly and permitted repair of the mylohyoid muscle. With this approach, a symmetrical incision was made across the midline within the submental and submandibular region. The distended ranula was exposed just deep to the surface and accessed by reflecting two portions of the mylohyoid muscle created by the rent in this muscle from the pressure of the plunging ranula (Figure 3). Intraoperative aspiration of the cystic cavity revealed salivary fluid mixed with pus, explaining the low grade fever preoperatively. The ranula and the offending gland were then excised with a pericapsular blunt dissection and wound closure done. The tissue was subjected to histopathological evaluation.

Histopathological examination of the lesion showed extravasation type ranula with rare patches of epithelium. There is intense inflammatory infiltrate in the underlying stroma with extensive hemorrhage and presence of granulation tissue along with few lobules of salivary gland acini and ducts (Figure 4). The patient was monitored for recurrence on follow up examinations. There was no sign of recurrence for the next 7 months.

Discussion
The ranula is a form of mucocele that specifically occurs in the floor of the mouth. The name is derived from the Latin word rana, which means frog, because the swelling may resemble a frog’s translucent underbelly.1 Ranulas can anatomically be divided into three main groups: (a) sublingual, above the mylohyoid muscle, (b) plunging, under the mylohyoid muscle and above the hyoid bone (suprahyoid ranulas) and (c) sublingual-plunging with an oral and a cervical component.2 Plunging and sublingual-plunging ranulas cause swelling in the neck by one of the following four mechanisms. Firstly, an ectopic sublingual gland may project through the mylohyoid, or an ectopic salivary gland may exist on the cervical side of mylohyoid. This explains most plunging ranulas that exist without an oral component. Moss and Hendrick reported the presence of ectopic sublingual salivary gland below the mylohyoid muscle.3 Secondly, a dehiscence or hiatus in the mylohyoid muscle may occur. Several studies have showed the presence of anatomical opening in the mylohyoid muscle for the passage of branches of the sublingual artery and vein, submental artery and lymph vessels. This defect is observed along the lateral aspect of the anterior two-thirds of the muscle. Through this defect, the mucin from the sublingual gland may penetrate to the submandibular space.4,5 Projections of the gland through a hiatus between the anterior and the posterior part of the mylohyoid muscle were reported in 45% of cadaver specimens and it shows the clear involvement of this herniation in cervical extension of the ranulas.6 Thirdly, approximately 45% of plunging ranulas occur iatrogenically after surgery to remove oral ranulas. Cases of plunging ranula formation have also been reported secondary to surgical procedures for sialolith removal, duct transposition and implant placement.6,8 Lastly, Patton postulates that aberrant duct from the deep lobe of the sublingual gland often open into the submandibular duct. This abnormal opening may cause stasis of salivary flow in the duct leading to extravasation of saliva into the neck.9 There are many approaches for the management of ranulas.1,10 These include excision of the ranula only, cryosurgery, marsupialization with or without cauteryization of the lesion lining, excision of the oral portion of the ranula with the associated sublingual salivary gland or, rarely, the submandibular gland, intraoral excision of the sublingual gland and drainage of the lesion, and excision of the lesion via a cervical approach, sometimes combined with excision of the sublingual gland. Despite these treatments, many patients have experienced recurrence and sometimes larger lesions have occurred. Excision of the ranula with the associated sublingual salivary gland is the most accepted method with low recurrence rate.11 The cases of sublingual-plunging ranula have been documented with moderate frequency. These cases have to be diagnosed carefully by clinical presentation supplemented by radiological, biochemical, and histopathological investigations. The treatment of sublingual-plunging ranula should be the excision of lesion along with the sublingual gland to avoid recurrence in accordance with well documented studies in the literature. Besides surgical management conservative methods include CO2 and Er, Cr: YSGG laser to vaporize ranulas, intra cystic injection of sclera therapy agents like OK-432 (a lyophilized mixture of low-virulence group A Streptococcus pyogens with penicillin G potassium), orally administered Nickel Glucionate-Mercurius Heel-Potentised Swine Organ Preparations D10/D30/D200 (a homotoxicological agent) and intracystic injection of botulinum toxin type A. Newer conservative methods are showing some promising results and have less morbidity and mortality. Further studies are required to establish these conservative approaches as a routine clinical intervention.

Conclusion
In conclusion the treatment of plunging ranulas must be based on the concept of removing the cause, i.e. the sublingual gland, in order to prevent recurrence, for the ranula itself does not possess the ability of mucus production.

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