

## Giant Plunging Ranula: A Rare Case Report

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**Abstract:** A ranula is a type of mucocele, and therefore could be classified as a disorder of the salivary glands. Usually a ranula is confined to the floor of the mouth (termed a "simple ranula"). An unusual variant is the cervical ranula (also called a plunging or diving ranula), where the swelling is in the neck rather than the floor of the mouth. Plunging ranulas are associated with oral swelling in 34% of cases. Another 21% of the cases occur without any oral involvement. A variety of surgical procedures have been quoted in the literature ranging from marsupialization, excision of the ranula, sclerotherapy, and excision of the sublingual gland. The recurrence rate varies according to the procedure performed. We report a case of giant plunging ranula involving the floor of mouth treated successfully by surgical excision.

**Keywords:** Plunging Ranula; Salivary Gland; Cervical Swelling

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### I. Introduction

The term "ranula" is used to describe a diffuse swelling in the floor of the mouth caused by either a mucous extravasation or, less commonly, a mucous retention cyst derived from the major sublingual or submandibular salivary glands [1]. The name "ranula" is derived from the Latin word "rana" meaning "frog". These represent for 6% of all oral sialocysts. They are most common in the second decade of life and in females [2]. The most common presentation of ranula is a painless, slow-growing, soft, and movable mass located in the floor of the mouth. Ranula may be simple or plunging. Simple ranula often present as masses in the floor of the mouth, limited to the mucous membranes. Diving ranulas extend through the facial plans, usually posterior to the mylohyoid muscle into the neck, and present as cervical masses. Primary etiology of these lesions is due to partial obstruction of a sublingual duct which leads to the formation of an epithelial lined retention cyst [3]. Congenital anomalies such as duct agenesis, hypoplasia of the sublingual gland and trauma causing direct damage to the duct or deeper areas of the sublingual gland are few of the other etiological factors. [4]. Ranula can present at any age but usually occur in children and young adults, with the peak frequency in the second decade [5]. In upto 45% of the cases, the patient's first presentation is an oral swelling. Plunging ranulas are associated with oral swelling in 34% of cases. Another 21% of the cases occur without any oral involvement. A variety of surgical procedures have been quoted in the literature ranging from marsupialization, excision of the ranula, sclerotherapy, and excision of the sublingual gland. The recurrence rate varies according to the procedure performed. We report a case of giant plunging ranula involving the floor of mouth treated successfully by surgical excision.

### II. Case Report

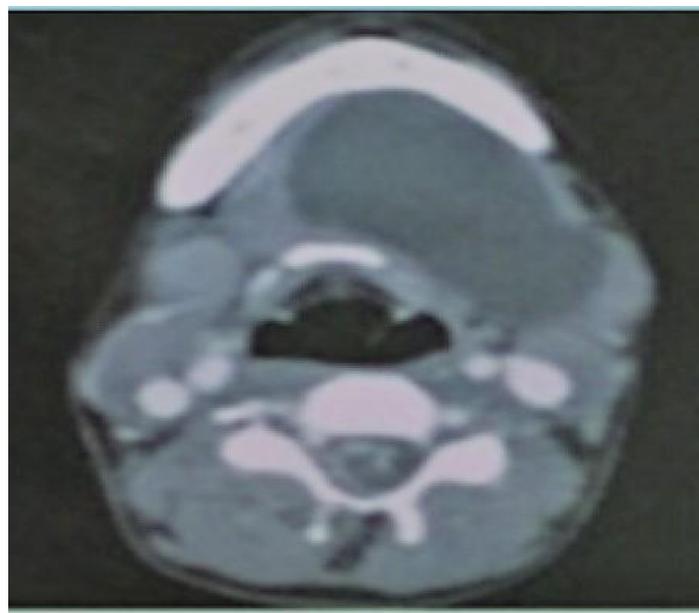
A 20 years female reported with a 3 months history of swelling in left submandibular region. Swelling was completely asymptomatic and there was a history of intermittent change in the size of swelling. The patient was in good health and had no history of any systemic disorder. Family history and personal history were not remarkable. On examination, general condition was good and vital signs were stable. A diffuse, soft, fluctuant, nontender swelling, about 10 x 5 cm in size, was present in left submandibular region (FIG 1). Overlying skin was normal in color. Oral mucosa, gingival, was normal and salivary ducts openings were patent. Intra oral examination shows elevated floor of mouth on left side (FIG 2). Ultrasonography of the swelling showed fluid collection in left submandibular region displacing submandibular gland extending to midline anteriorly. CECT shows ill-defined subtle peripherally enhancing hypodense cystic lesion measuring approx. 56 x 57 x 105 mm in the left submandibular, sublingual region extending in floor of mouth (FIG 3A, B). Based upon the clinic-radiological findings a tentative diagnosis of giant plunging ranula was made. Excision of the lesion was done via cervical approach under general anesthesia (FIG 4). The excised specimen is shown in FIG 5 and was subjected to histopathological examination.



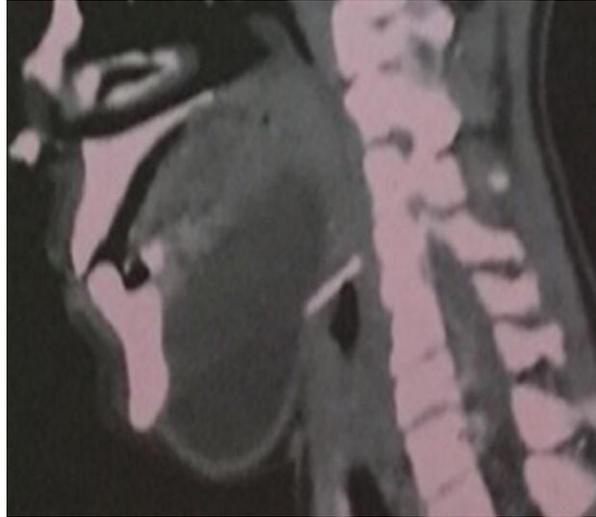
**Fig1.** Oral View Of Plunging Ranula



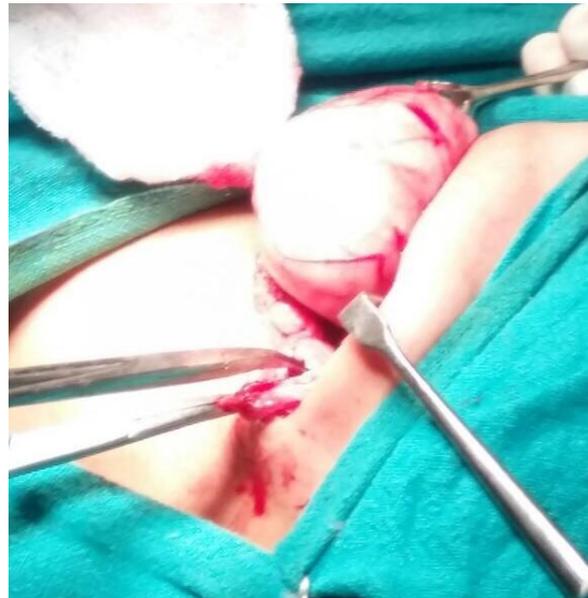
**Fig 2.** Extra Oral View Of Plunging Ranula



**FIG 3 A.** CT Scan showing Ranula



**FIG 3B.** CT scan showing Ranula.



**FIG 4.** Peroperative Photograph of Excision of Ranula



**FIG 5.** Excised Giant Ranula

### III. Discussion

Ranula develops from extravasation of mucus after trauma to the sublingual gland or obstruction of the ducts. The etiology is unknown, but it has been described in association with congenital anomalies, trauma, and disease of the sublingual gland [6]. In addition, the presence of ectopic sublingual gland tissue, beyond the mylohyoid muscle, may be causally related to a plunging ranula and provides evidence for their possible congenital origin. Surgical interventions have also been implicated in ranula formation. There are reports of plunging ranula that developed after the excision of a sialolith or transposition of the duct of the submandibular gland. The patho-physiology involved in extravasation is hypertension in the duct due to obstruction leading to acinar rupture in the salivary gland and then extravasation of the mucus. Plunging ranula arise in the neck by one of the following four mechanisms. Firstly, the sublingual gland may project through the mylohyoid, or an ectopic sublingual gland may exist on the cervical side of mylohyoid. This explains most plunging ranula that exist without an oral component. Secondly, a dehiscence or hiatus in the mylohyoid muscle may occur. 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. 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 [7,8]. Lastly, a duct from the sublingual gland may join the submandibular gland or its duct, allowing ranulas to form in continuity with the submandibular gland. Therefore, the ranula accesses the neck from behind the mylohyoid muscle [9]. Ultrasonography is usually inconclusive to study sublingual glands due to their location. On CT, the simple ranula is usually a roughly ovoid shaped cyst with a homogeneous central attenuation region of 10 to 20 HU. The cystic wall is either very thin or not seen, and the lesion is positioned lateral to the genioglossal muscles and above the mylohyoid muscle. The plunging ranula often infiltrates the adjacent tissue planes, extending inferiorly and dorsally to the submandibular gland region, while ventrally it may cross the midline to the contralateral floor of the mouth. Although a plunging ranula may extend into the submandibular triangle and displace the submandibular gland, it does not intrinsically affect this gland [10]. MRI is the most sensitive study to evaluate the sublingual gland and its states. On MR imaging, the ranula's characteristic appearance is usually dominated by its high water content. Thus, it has a low T1-weighted, an intermediate proton density, and high T2-weighted signal intensity [11]. Histopathologically, the cervical ranula appears identical to the mucus extravasation phenomenon. Biopsy of the lateral part of the neck may reveal only amorphous material with rare inflammatory cells and predominant histiocytes, which stains positive for mucin. Biochemical analysis of fluid shows its high amylase and protein content. There are several different methods for the treatment of cervical ranulas. These include excision of the ranula only, cryosurgery, marsupialization with or without cauterization 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 [12]. Risk for paresis and paralysis of the marginal mandibular nerve is the most common complication following surgical therapy of ranula [13]. A biopsy of the cystic wall is recommended not only for histologic confirmation, but also to rule out presence of squamous cell carcinoma arising from the cyst wall and papillary cystadenocarcinoma of the sublingual gland, which may present as ranula [14].

### IV. Conclusion

Giant plunging ranula may be difficult to differentiate from benign and malignant salivary gland tumors, especially cystadenocarcinoma and mucoepidermoid carcinoma. So thorough radiological, biochemical, and histopathological investigations should be carried out for all cases of suspected plunging ranulas. Excision of the ranula along with the involved sublingual gland and the subsequent confirmation with the histopathological findings is associated with low recurrence rate.

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