Case Report

Indian Journal of Dental Education
Volume 9 Number 2, April - June 2016
DOI: https://dx.doi.org/10.21088/ijde.0974.6099.9216.9

# Plunging Ranula

**Shilpa A.*, Ranjanishetty**, Shivaprasad S.***, Ashok L.******

**Abstract**

A ranula is an extravasated mucocele derived from the sublingual gland which lacks a proper capsule. When a ranula extends through or around the mylohyoidmuscle, it is termed as a plunging ranula and often presents with swelling in the submandibular or cervical region. Here we report a case of a 17 year old girl presenting with a swellingand intermittent pain in the left submandibular region since 6 months.

**Keywords:** Plunging Ranula ; Ultrasonography.

## Introduction

The origin of ranula is thought to be due to obliteration of minor duct of the sublingual gland.Extravasation of the saliva moves throughout the sublingual gland and in to the submucosa via hydrostatic pressure as the sublingual gland continues to produce saliva [1] . When ranula spreads to occupy the submental or submandibular space and has penetrated deep to the mylohyoid muscle it is reffered as plunging ranula [1].

## Case Report

A 17 year old girl reported to our department with a chief complaint of painful swelling in the floor of the mouth since 6 months (Figure 1) pain, was sudden in onset,intermittent aching type, & localised swelling was gradual in onset.Patient did not give any relevant medical history and also did not have any adverse habits. She did not give any history of trauma. On extra oral examination a diffuse swelling was seen extending from the left lower third of the face upto the left upper part of the neck measuring approximately 5cm x 6cm, the skin over the swelling was normal. On palpation local rise in temperature with tenderness, soft in consistency, fluctuating and compressible was noted. Lymph nodes were not palpable. Intra orally a solitary bluish red swelling was present on the left side of the floor of the mouth (Figure 2) which was measuring approximately 1.5cm x1.5cm, the surface was smooth it was tender, fluctuant , compressible and transluscent on palpation. On hard tissue examination all permanent teeth were present except third molars. Considering the above clinical features a provisional diagnosis of ranula of the floor of the mouth was considered.

Patient was advised for an ultrasonography to study the size, extent and nature of the lesion which revealed a large septated cystic lesion with thin septa noted in the left sublingual and the submandibular region .The lesion was seen to extend from the floor of the mouth to the left submandibular gland region and confined to medial aspect of the mandible(Figure 3).The lesion measures 5.1x2.9x2.6 cm. Both submandibular glands were unremarkable. Both parotids appeared normal and the impression given was septate cystic lesion in the left sublingual region extending in to the left submandibular gland region suggestive of plunging ranula.The excision of the lesion was done through cervical approach under general anaesthesia and the drainage of cystic contents along with excision of sublingual gland was subjected to Histopathological evaluation report revealed presence of salivary gland tissue with mucous acini arranged in tubular pattern ,intralobular and interlobular ductal structures along with very few serous acni. There is also presence of serous demilunes, nervebundles, bloodvessels, adiposetissue and hemorrhagic areas suggestive of mixed salivary gland tissue. The patient is under followup.

**Author's Affiliation:** *Post Graduate Student, **Reader ***Professor, ****Professor and HOD, Department of Oral Medicine and Radiology, Bapuji Dental College and Hospital Davangere 577004.

**Reprints Requests: Shilpa A.,** Post Graduate Student, Department of Oral Medicine and Radiology, Bapuji Dental College and Hospital Davangere 577004.

E-mail: dr.shilpa 338@gmail.com

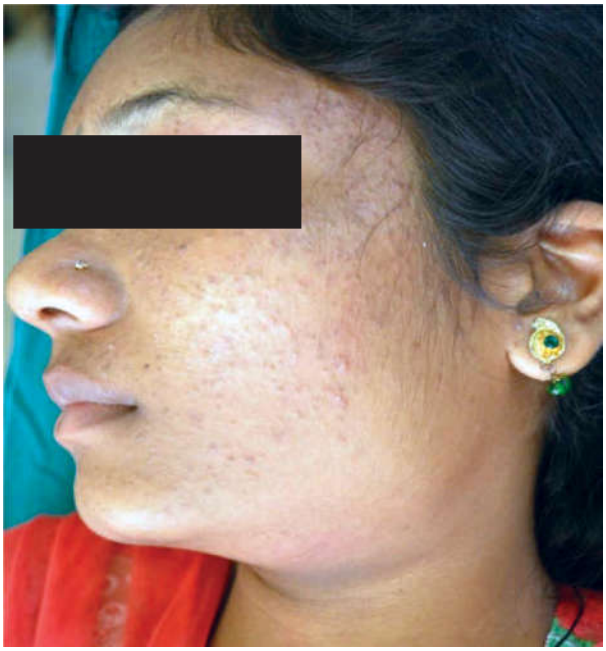

**Fig. 1:** Extraoral photograph showing swelling in the left submandibular region

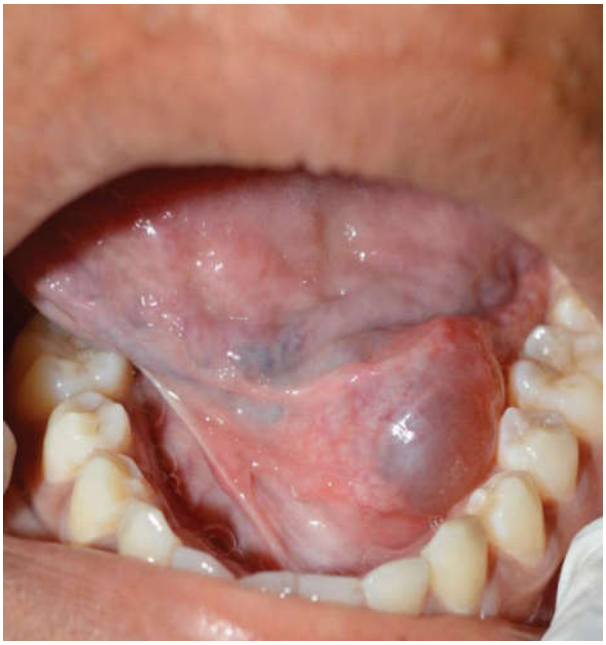

**Fig. 2:** Intraoral photograph showing swelling in the left side floor of the mouth

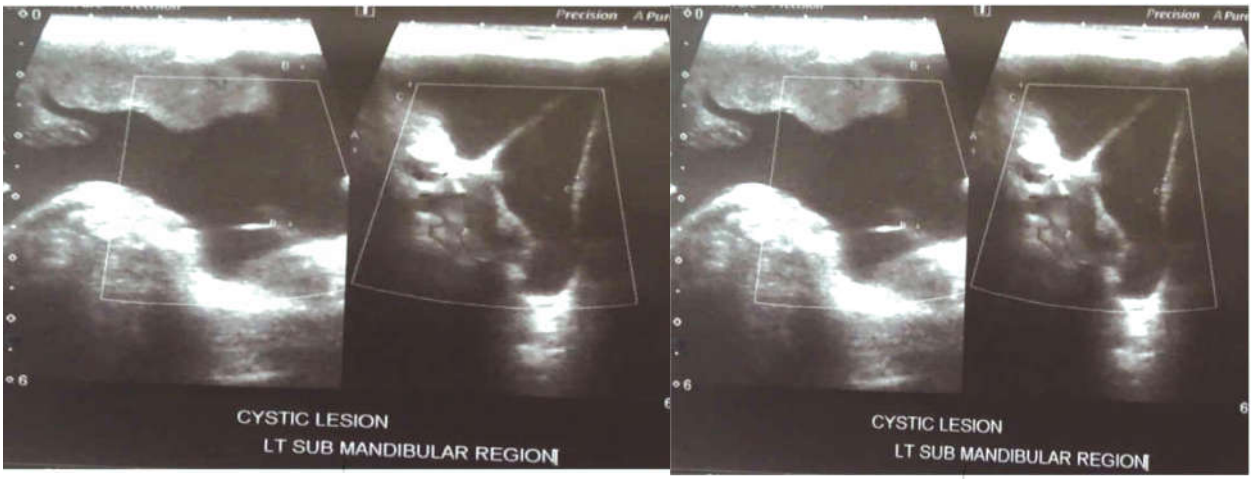


**Fig. 3:** Ultra sonogram showing a large cystic lesion in the left submandibular region

## Discussion

The name "ranula" has been derived from the Latin word "rana" which means "frog." The swellingresembles a frog's translucent underbelly or air sacs [2].

The most common cause of ranula formation is trauma other causes include an obstructed salivary gland or a ductal aneurysmand secreting mucous [15]. A ranula by definition is a mucus filled cavity, a mucocele, in the floor of the mouth in relation to the sublingualgland [3,4].

Hippocrates described ranulas as secondary to inflammation.The most common site is the lateral floor of the oral cavity [5]. Ranulas have a prevalence of about 0.2 cases per 1000 persons and accounts for 6% of all oral sialocysts. The number of ranulas that represents a true retention cyst ranges from less than 1% to 10%[6]. Ranulas usually occur in children and young adults, Presentation is most frequently in the secondand third decades of life, with an age range of 3–61 years, with the peak frequency in the second decade[5]. In general, ranulas continue to enlarge because the sublingual gland is a constitutive secretor of mucus. Ranulas are characteristically large (>2 cm) and appear as a tense fluctuant dome-shaped vesicle, sometimes with a blue hue [6].

When a ranula extends through or around the mylohyoidmuscle, it is termed as a plunging ranula and often presents with swelling in the submandibular or cervical areas(6). Patients present

first with an oral swelling in up to 45% of cases, with associated oral swelling in 34%, and without any oral involvement in 21% of cases [7,8].

Plunging ranulaoccurs when the fluid pressure of the mucin dissects througha perforation in the mylohyoid muscle in the submandibularspace. Plunging ranula, also known as a cervical or diving ranula,is a rare clinical entity[3]. Plunging ranulas arise in the neck by three mechanisms:The sublingual gland may project through the mylohyoid, or an ectopic sublingual gland may exist on the cervical side of the mylohyoid. This explains most plunging ranulas that exist without an oral component [8]. The cyst may penetrate through the mylohyoid. Up to 27–45% of mylohyoid muscles in cadavers are found to be dehiscent, usually in the anterior two thirds of the muscle. These sites of dehiscence provide a route of egress for the cyst. In some instances, surgical trauma from initial ranula operations may scar or fibrose the superior surface of a ranula. When the ranula recurs, the path of least resistance is through a dehiscent mylohyoid, and a plunging ranula forms when only a simple ranula was present initially. Up to 44% of all plunging ranulas are iatrogenically induced in this manner [9]. A duct from the sublingual gland may join thesubmandibular gland or its duct, allowing ranulas toform in continuity with the submandibular gland.Therefore, the ranula accesses the neck from behindthe mylohyoid muscle[9]. Plunging ranula is a soft ,compressible, mass in the submandibular or submental region, transillumination of the mass may be feasible in the large ranula [1]. Plunging ranula may be quite large and extend to the inferior aspect of the neck or chest wall [1].

Whenranulas present as a cervical swellingwithout an oral component, the diagnosis should be properlyconsidered. In such cases the differential diagnosis to be considered includethyroglossal duct cysts, branchial cleft cysts, parathyroidcysts, cervical thymic cysts, dermoid cysts, cystic hygromaand benign teratoma [11].

The Investigations that can be done includes Ultrasound helps in determining the extent of plunging ranula ,confirming the cystic nature of the lesion ,assessing the status of the mylohyoid muscle and evaluating the sublingual gland for rupture or herniation [14]. CT scanning can provide anoutline of the precise boundaries of the cyst, record theattenuation, and help narrow the range of diagnostic possibilities. Dermoid cysts and epidermoid cyst contains keratin and another material of high protein and or fatcontent, and lipomas have low attenuationThus, theseentities all differ in appearance in the CT scan from theplunging ranula which contains water mucin. The thyroglossalduct cyst is usually a midline structure and isusually demonstrable on the CT scan [10].

A branchial cleft cystis usually medial to the anterior border of the sternocleidomastoidmuscle [10]. A CT scan is especially useful in differentiating anterior cystic hygroma which generallycontains septae easily identified on the CT scan and theplunging ranula which is usually a single cavity[9]. MRI, which is the most sensitiveimaging modality for studying ranula, showed hyper intensefluid filled cavity in left sublingual space, extending to leftsubmandibular space along the posterior edge of mylohyoidon T-2 weighed images. T-1 weighed images showed awell-defined hypointense area suggestive of plunging ranula [12].

For a ranula, surgery is the first-choice of treatment. Therecurrence rates of ranula were not related to the swellingpatterns and surgical approaches, but intimately related tothe methods of surgical procedure [13]. Effective treatmentis removal of the involved sublingual gland or inducingsufficient fibrosis to seal the leak through which mucusextravasates [6].

Besides surgical management, CO2 laser has been usedto vaporize ranulas. In rare cases, radiation therapyis an alternative. Low doses of 20–25 gray are effective.Intracystic injection of the streptococcal preparation, OK-432, has been used to treat this lesion in a few reportedcases. The use of this sclerosing agent as a treatmentapproach for the cervical ranula is considered experimental. A recent study found orally administered NickelGluconate-Mercurius Heel-Potentised Swine Organ PreparationsD10/D30/D200, a homotoxicological agent to be aneffective treatment modality for ranulas [14].

## Conclusion

Plunging ranula is an unusual case it usually occurs in the second and third decade of life ,so conservative approach is necessary in such type of cases .

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