

A Plunging Ranula: A Case Report

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Abstract :

A plunging ranula is a mucous extravasation cyst appearing as a swelling in the submental and submandibular regions. A magnetic resonance imaging scan revealed the true extent of the lesion and its relationship to the surrounding structures. A case of massive plunging ranula causing respiratory distress is described along with its surgical management.

Key Words: *Plunging ranula, submandibular space, submental region, a magnetic resonance imaging*

Introduction

Ranula is a special type of mucocele, which occurs in the floor of mouth. The name “ranula” has been derived from the Latin word “rana” which means “frog.”[1,2] The swelling resembles a frog’s translucent underbelly or air sacs. Ranula is formed because of the trauma to submandibular or sublingual ducts. It starts as a painless swelling on one side of floor of mouth. The swelling is fluctuant, and none pitting on pressure. It may be superficial or deep to the mylohyoid muscle. Superficial ranulas have bluish translucency, deep one have the colour of mucosa, soft in consistency and freely movable.[2] When the size of lesion is significantly large, it may produce the medial deviation and superior elevation of tongue. A rare variety, which herniates through the mylohyoid muscle resulting as the swelling of the neck is called “Plunging ranula.”[4,5] This develop as a result of mucous extravasation. Here a case of massive plunging ranula causing respiratory obstruction and its managements is described.

Case report

A 48 yrs old male patient reported to dept of oral and Maxillofacial Surgery, Rural Dental College Loni with

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chief complaint of swelling on the neck since 8 months. On extra oral examination, a diffuse, soft, fluctuant, non tender swelling, about 4x3cm in size, was present in submental region, left submandibular region. Swelling was freely movable, skin overlying the swelling was normal except extra oral scar of previous surgery was seen in the left submandibular region. Swelling was associated with difficulty in respiration. (Figure 1)



Figure 1- Extraoral Frontal view showing swelling on the submental region

Intraoral examination revealed a large swelling in the floor of mouth, which was soft in consistency and fluctuant. Tongue was displaced upward and backward because of the swelling causing obstruction of airway. (Figure 2) Swelling was not associated with h/o trauma to teeth or pus discharge. Mucosa over the swelling was normal. Patient was moderately build and had no history of any systemic disorder. Vital signs were stable except patient had difficulty in breathing and dysphagia. Family history and personal history were not remarkable. Patient



Figure 2- Intraoral preoperative view showing swelling in the floor of mouth causing displacement of tongue posteriorly obstructing the airway.

gave history of surgical intervention and drainage of thick viscous fluid from the swelling six months back at his native place at private dental clinic. However, the swelling reappeared two months after the procedure. Therefore, he referred to dept of Oral Surgery RDC, Loni for definitive management. Magnetic resonance imaging (MRI) showed a thin walled cystic lesion on the floor of the mouth in the sublingual region and extending inferiorly into the submental region, laterally into the left submandibular region (Figure 3 a, 3b and 3c).

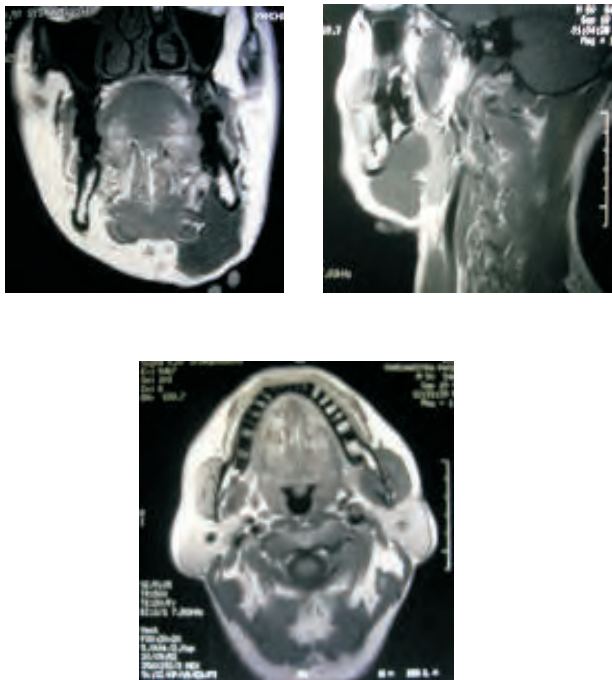


Figure 3- 3a), 3b & 3c - MRI Coronal T2-weighted MRI showing a high-signal-intensity lesion in the sublingual and submandibular spaces and extending medially and superiorly along the medial pterygoid muscle.

On clinicoradiographic findings and MRI report, diagnosis of plunging ranula was made. As patient was having difficulty in breathing, planned tracheostomy was carried out before taking patient for surgery. Following which there was marked improvement in the patient’s general condition. Surgical excision of plunging ranula was carried out by extra oral approach under general anaesthesia and Intra orally sublingual glands were excised. (Figure 4a, 4b and 4c)



Figure 4a- Showing marking of Submandibular Incision



Figure 4b - Shows separation of ranula from surrounding tissue



Figure 4c- Removal of ranula in toto

Specimen was sent for histopathologic examination. Histopathological picture of the excised lesion was showing mucin collection in the lumen lined by connective tissue with inflammatory cells. (Figure 5) Histopathologic report was confirmatory of ranula. Tracheostomy tube was removed on second day postoperatively. Patient had follow up for period of 6 months. There was no history of recurrence, after that period patient didn’t report to the department hence further follow up was not possible.

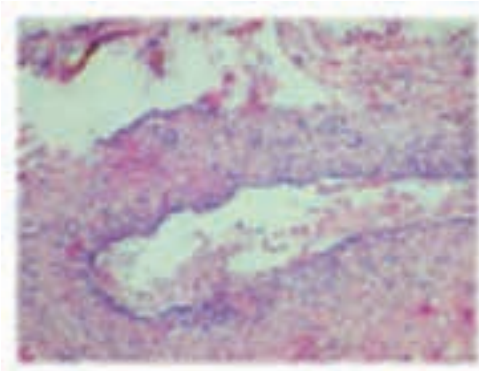


Figure 5 - Histopathological picture of the excised lesion showing mucin collection in the lumen lined by connective tissue with inflammatory cells.

Discussion

Ranula develops from extravasation of mucus after trauma to the sublingual gland or obstruction of the ducts.[2,3] Ranula can present at any age. It has been reported from 2 to 61 years of age with a slight female preponderance. The etiology is unknown, but it has been described in association with congenital anomalies, trauma, and disease of the sublingual gland.[5] The pathophysiology 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. The initial stage is a traumatic rupture of the excretory duct and the second stage is the extravasation and subsequent accumulation of saliva within the tissue, as shown by experimental studies.[6,7] Ranula in infancy may be due to duct agenesis, hypoplasia, or due to birth trauma. These extravasation cysts, which involve the sublingual salivary gland, can be classified into oral, mixed, or plunging and cervical ranula. When these extravasation cysts extend into the submandibular or submental space, they are called plunging ranula.[3,4] Its true incidence is unknown. Plunging ranulas generally appear in conjunction with an oral ranula. Rarely can they arise independently of the oral component. In this patient plunging ranula was associated with oral swelling. (Figure 1 & 2) In the absence of oral swelling, the clinical diagnosis of ranula may not be suspected. 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. The cause of plunging ranula is not known, but anomalies or obstruction of the salivary gland duct and naturally occurring defects in the mylohyoid muscle have been shown to be prerequisites for the extravasation. These cysts commonly extend into the submandibular triangle,

occasionally they may extend superiorly into the parapharyngeal space as far as the base of the skull and inferiorly to the supraclavicular area and upper mediastinum or posteriorly into the retropharyngeal space.[5,8,9] Rarely, large-sized ranulas may cause dysphagia or airway obstruction. In this case patient had airway obstruction because of large size sublingual swelling which required tracheostomy preoperatively. Ranula is a clinical diagnosis, and imaging studies are done mainly to know the extension of swelling prior to surgery or when the diagnosis is unclear. Takimoto suggested a simple radiographic technique for preoperative diagnosis of plunging ranula that involves injecting a contrast media in sublingual space.[10] A sialogram performed on a patient with a sialocyst reveals smooth displacement of the glandular ducts around the mass. No direct communication with the ductal system is demonstrated. However, the best method of demonstrating a communicating cyst is by sialography. Computed tomography and specifically the presence of "tail sign" is pathognomonic for the plunging ranula.[11] This tail is due to extension behind the mylohyoid muscle and confirms the ranula to arise from the sublingual gland and is especially useful in differential diagnosis of cervical ranula. MRI, which is the most sensitive imaging modality for studying ranula. The characteristic appearance of ranula on MR imaging is usually dominated by its high water content, it has a low T1-weighted, an intermediate proton density, and high T2-weighted signal intensity. This appearance, especially in a plunging ranula, may be similar to that of a lymphangioma, a lateral thyroglossal duct cyst, and possibly an inflamed lymph node. Differential diagnosis of cervical ranula must include thyroglossal duct cyst, branchial cleft cyst, cystic hygroma, submandibular sialadenitis, intramuscular hemangioma, cystic or neoplastic thyroid disease, infectious cervical lymphadenopathy (Epstein-Barr virus, cat scratch disease, tuberculosis), hematoma, lipoma, laryngocele, and dermoid cyst.

Clinicians have been using 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.[6] 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. Besides surgical management, CO2 laser has been used to vaporize ranulas.[13]

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