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Ranula: A case report and review of literature

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Abstract
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. The swelling resembles a frog's translucent underbelly or air sacs. This paper reviews and highlights a case report of ranula that has been successfully treated by surgical excision. A 19-year-old male suffered from unilateral swelling in the floor of the mouth that had been enlarging slowly over the past 2 months. Conventional surgical excision was done. No complication was observed during the postoperative period, and there was no recurrence in the 6-mo follow-up period.

Keywords: ranula, marsupialization, sublingual salivary gland

1. 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 term 'ranula' is used because this lesion often resembles the swollen abdomen of a frog (Latin word rana, meaning frog). 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 moveble mass located in the floor of the mouth. Usually, the lesion forms to one side of the lingual frenum; however, if the lesion extends deep into the soft tissue, it can cross the midline [2].

Ranulas are characteristically large (more than 2 cm) and appear as a tense fluctuant dome-shaped vesicle, sometimes with a blue hue. The most common site is the lateral floor of the oral cavity. Rarely, the mass may interfere with speech, mastication, respiration, and swallowing due to the upward and medial displacement of the tongue [3]. Ranula can be classified into two types, simple (intra oral) and the plunging (cervical) type. A simple ranula represents a localised collection of mucous within the floor of the mouth and is the more common type than plunging type. This article presents a case of simple ranula in ninteen year old male patient treated with excision of sublingual gland.

Case Report

A ninteen year old male patient reported to the outpatient Department of Oral Medicine & Radiology with a chief complaints of pain and swelling below the tongue on the left side, for the past two months. On intraoral examination, a diffuse, soft, fluctuant, non-tender swelling, extending from mesial surface of 1st molar to the central incisor, about 4 × 5cm in size, was present in left submandibular region (Figure 1). Oral hygiene was poor. There was no displacement of tooth and no loosening of tooth. There was no history of injury or surgical procedure involving the floor of the oral cavity. The swelling was asymptomatic and there was a history of intermittent change in the size of swelling. He was in good health and had no history of any systemic disorder. Family history and personal history was not markable. On examination, the general condition was good and vital signs were stable. General physical examination was not significant.

Extraoral examination revealed a single, oval, enlarged right submandibular lymph node which was tender on palpation. There were no neck swellings.

Investigation

Results from hematological and biochemical investigations including complete blood count (CBC), bleeding time, clotting time, erythrocyte sedimentation rate(ESR), liver function tests, kidney function tests, random blood sugar were all within normal limits. Chest X-ray was normal.

Based on history and clinical features provisional diagnosis of "ranula" was considered. A differential diagnosis of Mucocele of Wharton's duct, Lingual varicosities (A-V malformation), dermoid and epidermoid cyst were considered. Radiographic examination with mandibular occlusal radiograph showed no abnormal changes. (Fig.2). Ductal patency was checked by injecting the urografin dye directly in to the sublingual gland under local anesthesia.

Treatment

Patient was referred to department of oral surgery for the

treatment. Surgical excision of the lesion was done under local anesthesia, followed by suturing. (Fig.3). Tissue specimen was sent to the department of Oral Pathology for histopathological examination. Following surgery, the patient was placed on a normal diet, 5 days of therapy with antibiotics and analgesics orally. The sutures were removed 7 days after the surgery [Figure 4].

Follow Up

Postoperative follow-up of 6 months showed no recurrence, and the patient had no complaints pertaining to the site of lesion.

Histopathological Report

Histopatological findings showed an area of spilled mucin surrounded by a granulation tissue response. The inflammation includes numerous foamy histiocytes (macrophages).(Fig.6)

Fig 1: Intraoral view

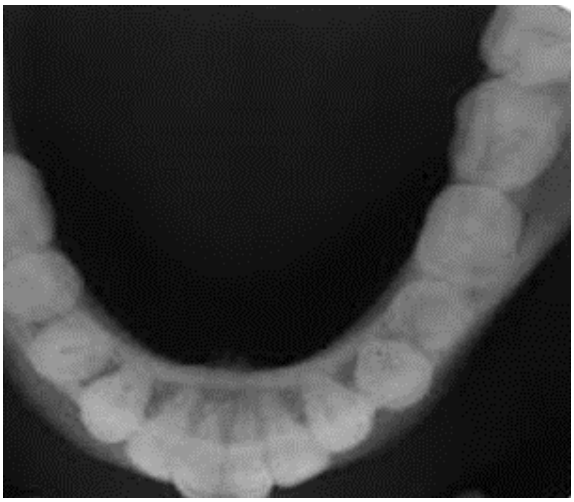

Fig 2: Occlussal radiograph

Fig 3: Sutures placed after surgery

Fig 4: After suture removal, (lesion Was healing)

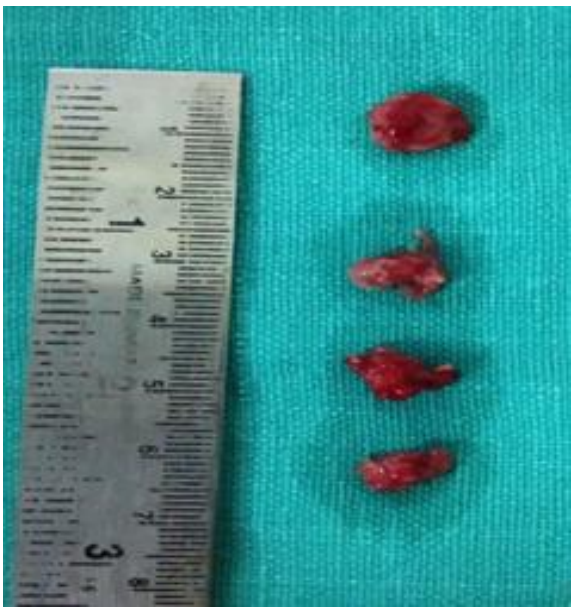

Fig 5: Gross specimen

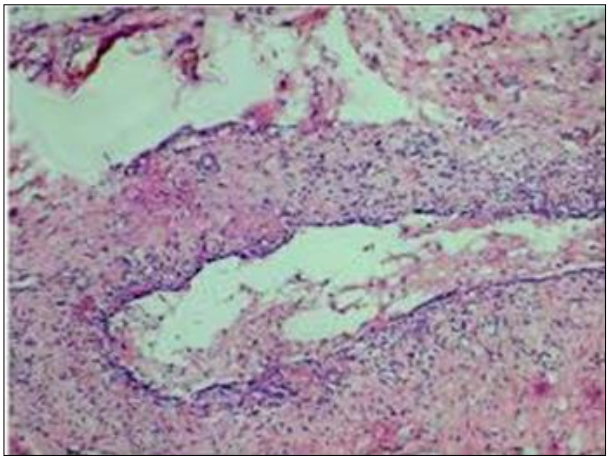

Fig 6: Photomicrograph of specimen under Low power view (10x)

Discussion

Ranula was reported even during the period of Hippocrates and Celsius [4]. The incidence of a ranula is estimated to be 0.74% with the peak frequency in the second decade [5].

Ranula develops from extravasation of mucus after trauma to the sublingual gland or obstruction of the ducts [6,7]. Ranula can present at any age. It has been reported from 2 to 61 years of age with a slight female preponderance.[8] Regarding the Patel *et al*. study a total of 26 ranulas were identified at their institution over an 18-year period. There were 54% male and 46% female patients with an average age of 25.6 and a median age of 26. Of the 26 ranulas identified, 16 were oral (62%) and 10 were plunging (38%) [9].

The etiology is unknown, but it has been described in association with congenital anomalies, trauma, and disease of the sublingual gland.

Oral ranula is an infrequent pathology, usually occurring in children and adolescents [10,11]. This case also presents a lesion in a adolescent young boy.

When these extravasation cysts extend into the submandibular or submental space, they are called plunging ranula. 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. They may extend inferiorly to the supraclavicular area and upper mediastinum or posteriorly into the retropharyngeal space [12].

Table 1: Types: According to their site of location, Ranulas can be classified as following 3 types. [12].

1	Simple ranula	Located in the floor of the mouth
2	Cervical ranula	Located in the paracervical region
3	Plunging ranula	Located near the upper airway and extending into the floor of the mouth. [plunging ranulas show a so called 'tail sign' on MRI]

Table 2: Based on the pathogenesis there are two different types of ranulas [13].

1. True cyst	Whenever there is an obstruction in the ducts of sublingual gland or ducts of one of the minor salivary glands leads to formation of a true cyst. This type of ranula has an epithelial Lining
2. Psuedocyst	This type of ranula does not have an epithelial lining. This is formed due to ductal injury of the sublingual salivary gland, leads to extravasation of saliva and accumulation into the submucous tissue. occasionally this type of ranula is surrounded by granulation tissue or condensed connective tissue.

According to these classifications, present case belongs to 'Simple' and 'Psuedocyst' category. The extension of ranula to the submandibular and upper cervical region is related to the herniation of the mylohyoid muscle by the sublingual gland, that was not happened in this case. 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. 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 ranulas that developed after the excision of a sialolith or transposition of the duct of the sub mandibular gland [13].

According to Gupta *et al*., Kalra *et al*., and Zhao *et al*. studies the cervical ranula appears as an asymptomatic, continuously enlarging mass that may fluctuate in size. Most reported ranulas are 4–10 cm in size. The overlying skin is usually intact. The mass is fluctuant, freely movable, and non-tender. [17-19] The mass is not associated with the thyroid gland or lymph node chains. In some instances, detecting salivary gland herniation of a portion of the sublingual gland through the mylohyoid muscle into the neck may be possible. The mass may not be well defined, but should follow the facial planes of the neck and may extend into the mediastinum. Similar to the oral ranula, the mass tends to cause a lateral swelling; however, it may cross the midline. They have been reported to extend into the submental region, the contralateral neck, the nasopharynx up to the skull base, the retropharynx and even into the upper mediastinum. [15,16] Rarely, large-sized ranulas may cause dysphagia or airway obstruction.

Pathogenesis of ranula was investigated by Bhaskar *et al* [14] histopathologically and experimentally, and they concluded that ranula was produced by the extravasation of saliva from a damaged salivary sublingual gland and was not lined by epithelium. The occurrence of ranula is rare, and the reported male-to-female ratio is 1: 1.3, without significant side preference [15]. Ranula commonly occurs unilaterally, and bilateral ranulas are extremely rare, although rarely reported in literature. Clinically it appears as bluish, fairly well-circumscribed, soft, painless, fluid-containing intraoral swelling. Most of the patients usually present with a gradually enlarging swelling of the floor of the mouth with or without pain. Ranulas usually occur in children and young adults, with the peak frequency in the second decade. The cervical variant tends to occur a little later in the third decade.

The histopathologic expression of a ranula is similar to that

of a mucocele in other locations. On microscopic examination, the mucocele shows an area of spilled mucin surrounded by a granulation tissue response. The inflammation usually includes numerous foamy histiocytes (macrophages). In some cases a ruptured salivary duct may be identified feeding into the area. The adjacent minor salivary glands often contain a chronic inflammatory cell infiltrate and dilated ducts [20].

The diagnosis of ranula is based principally on the clinical examination although computerized tomographic (CT) or magnetic resonance imaging (MRI) used in plunging lesion. If there is a doubt about the diagnosis, aspiration of the mucous from the lesion and a laboratory determination of amylase content should make the diagnosis of ranula obvious [16].

Surgery is the main stay for the management of ranulas. These include incision and drainage, excision of ranula, marsupialization, and marsupialization with packing or complete excision of the sublingual gland [21]. In 1973 Roediger *et al*. reported that two cases of plunging ranula were treated by primary excision of the sublingual gland through the mouth [22]. Simple marsupialization has fallen into disfavor primarily because of the failure rate, which has been anywhere from 61% to 89%. Marsupialization with packing of the cyst cavity may reduce the recurrence [21].

Other treatment modalities have also been utilized. Sclerotherapy with OK-432 is a good substitute for surgery [23]. Recurrence was noted in 14.3% and the patient had an average of 1.7 injections. Fukase *et al*.,[24]. used a higher concentration in partially regressed cases and had 100% cure rate.

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