MANAGEMENT OF RANULA WITH MARSUPIALIZATION TECHNIQUE: SERIAL CASE

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ABSTRACT Introduction: There are various kinds of salivary gland lumps in the oral cavity; therefore, required history taking and adequate examination for proper diagnosis. One of the most common salivary lumps of the salivary glands is the ranula. Ranula is a term to describe an extravasation cyst that occurs on the floor of the mouth. It usually looks unilateral and is a bluish lump like a frog belly. **Purpose:** The purpose of this case series to explain the proper management of the ranula with marsupialisation techniques. **Case Report:** Three cases of ranula at the floor of the mouth in the oral and maxillofacial surgery department of Dr Hasan Sadikin Hospital. Clinical examination in all three patients there was a lump under the tongue that was not painful and growing larger. **Discussion:** Ranula is a form of cyst due to obstruction of the major salivary glands found on the floor of the mouth, which will give swelling and bluish appearances under the tongue. If it's not immediately treated will have a bad effect, because swelling can disrupt the function of talking, chewing, swallowing, and breathing. In this case, we performed surgical therapy with marsupialisation technique that aims to decompress the ranula. Excisional ranula therapy can cause trauma to the lingual nerve, causing paresthesia and injury to the submandibular salivary duct. **Conclusion:** The marsupialisation technique has the advantage of being less invasive because it can protect the vital structures from surgical damage.

KEYWORDS Salivary gland, Marsupialization, Ranula

Introduction

The oral cavity has three pairs of major salivary glands including parotid, submandibular, sublingual and minor salivary glands distributed in the oral cavity, into the larynx and pharynx. Overall saliva production is approximately 1500 ml per day. Saliva functions as a lubricant in speech help the process of mastication and swallowing. It also contains immune substance against bacteria.[1]

Salivary gland swellings are commonly found in the oral cavity. Proper examination is required in determining a diagnosis. One of the most commonly found salivary gland lump is ranula. The term "Ranula" comes from the Latin terminology which means toad. The term of ranula used to describe the mucocele that appears at the bottom of the mouth. Ranula usually appears unilateral and has a bluish lump like a toad's abdomen.

Ranula is classified into two types, namely superficial ranula or simple ranula and deep ranula or cervical ranula or plunging ranula. Ranulas often appear in children and adolescents. However, it is usually found in the third decade of life and is more common in women.[2,3]

Ranula generally is associated with the submandibular space that can be affected when salivary gland damage occurs. Practitioners must understand the anatomical shape of the space in the neck in determining the treatment. Also, several mouth diseases have been linked to the salivary glands and have similar clinical appearance to ranulas such as mucoceles and several other diseases. However, ranula is a mouth disease that must be treated seriously because it can infect the submandibular space due to trauma or other causes.[4,5]

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Literature review

Salivary glands can be classified to major salivary glands (parotid, submandibular, and sublingual) and minor salivary glands. The parotid gland is the largest salivary glands that secrete saliva through the Stensen duct to the oral cavity in chewing and swallowing mechanisms. This gland is the largest gland located on the surface of the masseter muscle located behind the ramus of the mandible, anteriorly and inferiorly to the ear. The parotid gland produces only 25% of the total saliva, which is mostly serous fluid. The submandibular gland is the second largest gland after the parotid gland. This gland is located in the medial part of the mandibular lower angle. The submandibular glands produce 60-65% of the total saliva in the oral cavity, which is a mixture of serous and mucous fluid.[4]

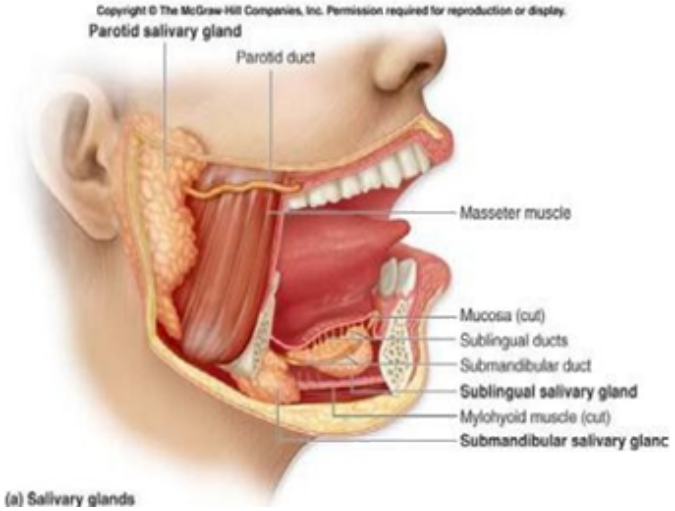

Figure 1: Salivary glands [4].

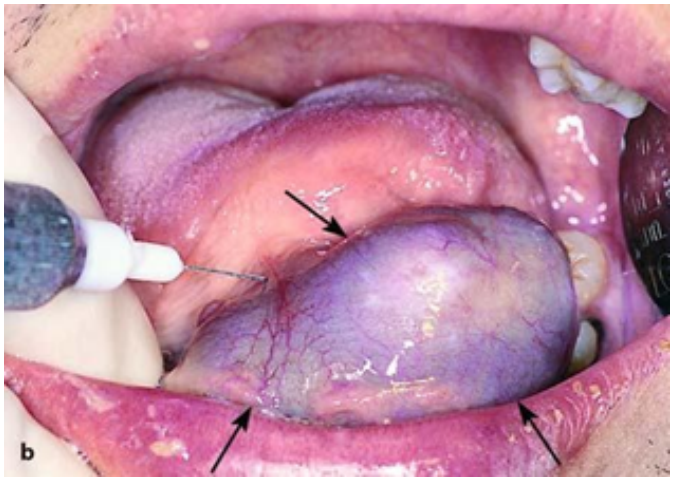

Figure 2: Anaesthesia around the lesion.

The sublingual gland is a gland located in the sublingual fossa, the anterior part of the mouth. It is the smallest major salivary gland that produces 10% of the total volume of saliva in the oral cavity whose secretion is dominated by mucous fluid. Minor salivary glands consist of 1000 glands (1-2 mm in diameter) over the mucous lining of the oral cavity, especially in the buccal mucosa, palate, hard palate and soft palate, lingual mucosa, labial mucosa, uvula, floor of the mouth, posterior tongue,

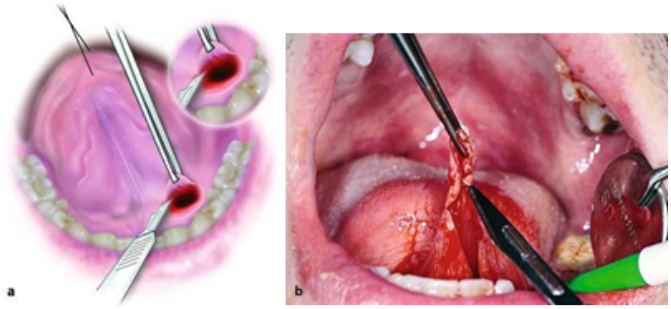

Figure 3: The circular incision in the superior wall of the lesion.

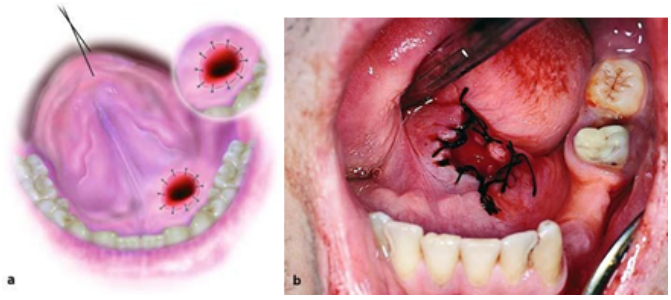

Figure 4: The edge of the lesion is sutured with the oral mucosa [1].

base or ventral of the tongue, and retromolar & peritonsillar region, and lacrimal system. Minor salivary glands mainly produce mucous fluid, except in the Von Ebner's gland (the gland in the circumvallate papillae of the tongue) which produces serous fluid. [4]

Ranula

The term "Ranula" comes from the Latin terminology, which means toad. Ranula is a term to describe a mucocele that appears at the bottom of the mouth. It usually appears unilaterally and is a bluish-coloured lump like a toad's abdomen. Ranula is classified into two types, namely superficial ranula or simple ranula or oral cavity ranula and deep ranula or cervical ranula or plunging ranula. [6,7] Plunging ranula is a pseudocyst that originates from extravasation of mucus and large salivary glands located at the base of the mouth, which develops deeper and wider, so that it exits the floor structure of the mouth into the submental space. The causes of ranula are classified into two categories, most often extravasation (no epithelial layer), i.e. saliva enters the surrounding tissue due to trauma to the salivary gland duct and rarely a retention cyst, which is covered by epithelium from ductal epithelium.[8,9]

Clinically, the ranula has a picture of a simple lump on the floor of the mouth, pushing the tongue upward, generally unilateral, rarely bilateral, transparent thin-walled, reddish blue, slow-growing, appearance like a toad abdomen. If the enlarged lump can interfere with speech, eating or swallowing process, lumps for some reason can break itself, the fluid comes out, deflates then arises or becomes relapsed, and in a simple ranula, the lump is superficial while the plunging ranula lumps are deeper, can spread to the base of the mylohyoid muscle, submandibular region, to the neck or even to mediastinum.[10,11]

Although most ranulas originate in the sublingual gland, it is possible to derive from the secretion of the submandibular salivary gland duct or minor salivary glands on the floor of the

Figure 5: Intraoral clinical picture.

Figure 6: Intraoperative and Postoperative Day 1.

mouth.[7] Ranula is not followed by pain. The complaint most often expressed by the patient is that the mouth feels full and the tongue is lifted. If it is not immediately treated, it will continue to interfere with the function of speech, chewing, swallowing, and breathing. A large Ranula will suppress the salivary gland duct and cause the flow of saliva to be disrupted. Salivary gland obstruction can lead to pain when eating or pain when the salivary gland is stimulated to secrete saliva. The salivary gland can also be swollen.[1]

Pathophysiology

Base on the occurrence, ranula is caused by several mechanisms, namely (Harrison, 2010; Irfan, 2017, O'Connor, 2013):[8]

1. Partial or total secretory ductal obstruction by the presence of sialolith, congenital malformations, stenosis, periductal fibrosis, scarring around the duct, trauma, agenesis of the secretory duct or tumours resulting in inhibition of salivary flow from the salivary gland. Mucous exits through an open area or the dehiscence of the mylohyoid muscle. Extravasation of the sublingual salivary gland causes a cervical ranula or plunging ranula.

2. The ectopic sublingual gland is thought to be very closely related to the occurrence of ranula. If the mucus secretions enter the neck region through the mylohyoid muscle, it extends into the facial soft tissue, which will cause diffused swelling of the lateral and submental regions of the neck.

3. Continuous production of the sublingual gland will accelerate mucus accumulation in the neck and constant expansion of the cervical region.

Figure 7: After removal gauzed and one month post-operative.

Figure 8: Intraoral clinical picture.

4. Rupture of the acini gland caused by hypertension from a blocked duct is another mechanism that may be related to the development of lesions.

5. Trauma that damages the parenchymal cells of the salivary gland lobe. There are several types of treatment for ranula, including sclerotherapy, excision, and marsupialisation. Some authors recommend marsupialisation as the treatment of choice, especially in pediatric patients. The marsupialisation technique has the advantage of being less invasive because it can protect vital structures from surgical damage.

Stages of procedure for marsupialisation, namely:

- Asepsis technique in the operating area with povidone-iodine solution
- Lingual block anaesthesia is performed with regional infiltration around the lesion
- The superior wall of the lesion is clamped and pulled with a hemostat then a circular incision is made by including the oral mucosa that covers the lesion.
- After the cyst fluid has been aspirated, the edge of the lesion is sutured with the oral mucosa using non-absorbable suture, which unite the peripheral mucosa that is not involved with the mucous lesion. Sutures are maintained for one week. Then the operation area is covered by sanitary napkins coated with antibiotic ointment (size 3/8 inch). Sanitary napkins are removed after 48 hours. [1]

Case	Size	Colours	Aspiration	Complication	Recurrence
I	3X3X3 cm	Bluish	Clear fluid	-	-
II	4x3x3 cm	Bluish	Clear fluid	-	-
III	6x4x4 cm	Bluish	Clear fluid	-	-

Figure 9: Intraoperative and Postoperative Day 1.

Differential Diagnosis

Several oral diseases have similar clinical features with ranula, including mucocele, dermoid cyst, sialolithiasis, thyroglossal duct cyst, cystic hygroma, and neoplastic thyroid disease.[4]

Case Report

Case 1

A 9-year-old girl presented with a lump under the tongue. The lump began to appear since one month ago. The lump looked lumpy and didn't hurt. Intraoral clinical examination showed a 3x3x3 cm lump in the floor of the mouth which is soft, tender (-), and bluish in colour. The result of aspiration is clear fluid.

Based on the results of the examination, it was diagnosed as a ranula, so it was decided to perform marsupialisation using general anaesthesia. Before surgery, disinfection in the area of operation and injection of a vasoconstrictor was performed. Furthermore, a 2 cm incision was carried out over the surface of the mass only on the mucosa which was directly bounded by the capsule of the mass. All the mass fluid was removed until it was filled with iodoform gauze as antibiotics, then the operating area was sutured. Patients were instructed to undergo a soft diet, administration of ceftriaxone injection 1 gram/12 hours, and ketorolac injection 10 mg / 12 hours. The patient was advised to attend one-week postoperative control for iodoform dressing.

Case 2

A 9-year-old girl presented with a lump under the tongue. The lump appeared 3 years ago and had been operated once. Initially as big as pea seeds, they grew to the size of red bean seeds. The patient also complained a painful sensation while swallowing. Intraoral clinical examination shows a 4x3x3 cm size lump in the floor of the mouth which was soft, tender (-), and bluish in colour. The clear condensed liquid in the mass was found as the result of the examination after mass aspiration.

Then the patient was planned to undergo marsupialisation under general anaesthesia. Furthermore, a 2 cm incision was carried out over the surface of the mass only on the mucosa which was directly bounded by the capsule of the mass. The entire mass of the excretion was then filled with iodoform gauze; then the operating area was sutured. Postoperatively, patients were instructed to undergo a soft diet, administration of ceftriaxone injection 1 gram / 12 hours, and ketorolac injection 10 mg/12 hours. Patients were instructed to attend one-week postoperative control for iodoform dressing.

Figure 10: A week after marsupialisation.

Case 3

A 34-year-old man presented with a lump under the tongue. The lump appeared since one year ago. Initially as big as pea seeds, they grew to the size of a ball. Patients complain of difficulty swallowing and speech. Intraoral clinical examination showed a 6x4x4 cm lump in the floor of the mouth that was soft, tender (-), and bluish in colour. The clear, condensed liquid in the mass was found as the result of the examination after mass aspiration.

The patient was planned to undergo a marsupialisation procedure under general anaesthesia, performing a 2 cm incision above the surface of the mass only on the mucosa which was bounded directly with the capsule mass. The entire mass of the excretion was then filled with iodoform gauze; then the operating area was sutured. Postoperatively, patients were instructed to undergo a soft diet, administration of ceftriaxone injection 1 gram / 12 hours, ketorolac injection 30 mg / 12 hours, and

Figure 11: Intraoral clinical picture.

Figure 12: Intraoperative and Postoperative Day 1.

ranitidine injection 50 mg / 12 hours. Patients were instructed to have a 1-week postoperative control for iodoform dressing.

Discussion

The series of the case presented here show the same clinical appearances so all of them can be classified as ranula. To establish a diagnosis, procedures are carried out to cover several stages. The first thing is to obtain clinical history. Secondly, undergo a physical examination of the patient and investigation.[7] Then a radiographic examination can be performed, including MRI examination, CT scan, ultrasonography, sialography, and conventional radiography. The investigation, in this case, is not necessary because the clinical and diagnostic history is considered enough to define the diagnosis.

The treatment of choice is marsupialisation because this technique has the advantage of being less invasive. It can protect vital structures from surgical damage. The marsupialisation technique in ranula is often the treatment of choice, especially in pediatric patients and in large ranula. Based on 9 cases of ranula that have been treated, it can be concluded that marsupialisation is an appropriate and effective method for treating ranula in children (Yuca, 2005). After Marsupialization, there are no complications reported by the patients, and in a month after the procedure, there was no recurrence. Ranula treatment with the only marsupialisation is associated with the recurrence of 14-67% .[12]

To be able to distinguish between ranula and other diseases of the salivary glands, obtaining a clear history of mass or swelling is necessary. A clear clinical picture that illustrates the specific characteristics of the ranula including bluish colour lump resembling a toad's abdomen without pain when the fluctuating slow-growing mass can be moved, bounded firmly and localised

Figure 13: After removal gauze and a month after marsupialisation.

presented on the floor of the mouth.

Conclusion

These case series are diagnosed as a ranula because it has a bluish-coloured clinical picture, without pain, and is a soft slow-growing and fluctuating appearance located at the floor of the mouth. The treatment of choice is marsupialisation to decompress the ranula. There is no recurrence after marsupialisation procedure.

Competing interests

The authors declare no conflict of interest.

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