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<td>Author(s)</td>
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<tr>
<td>Citation</td>
<td>Acta Medica Nagasakiensia, 55(2), pp.77-79; 2011</td>
</tr>
<tr>
<td>Issue Date</td>
<td>2011-03</td>
</tr>
<tr>
<td>URL</td>
<td><a href="http://hdl.handle.net/10069/24846">http://hdl.handle.net/10069/24846</a></td>
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Case Report

Plunging Ranula: Report of a Case

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The plunging ranula is an extravasation cyst of the saliva from the sublingual gland. We report a case of plunging ranula, which was diagnosed through CT and analysis of aspirated fluid, and was treated successfully by excision of the sublingual gland via an oral approach. We consider the essentials of management for plunging ranulas to be correct preoperative diagnosis and excision of the sublingual gland via a transoral route.

ACTA MEDICA NAGASAKIENSIA 55: 77 - 79, 2011

Keywords: plunging ranula, sublingual gland

Introduction

The ranula is a pseudocyst resulting from extravasation of salivary secretion from the sublingual gland. Ranulas are generally classified into two groups: simple (oral) and plunging ranulas. A simple ranula usually presents as a translucent swelling in the floor of the mouth and is relatively easy to diagnose as a ranula, but a plunging ranula usually presents as a soft, fluctuant swelling in the neck, and needs to be distinguished from other cystic diseases. Preferred treatment of both oral and plunging ranulas remains controversial.

We report a case of plunging ranula in which computed tomography (CT) and analysis of the aspirated fluid were useful in the preoperative diagnosis. We successfully treated the ranula by simple excision of the sublingual gland via an oral approach. In this report we discuss the optimal diagnosis and treatment techniques for a plunging ranula.

Case report

A 15-year-old female reported an extensive swelling of the left submandibular region of three months' duration. At the time of the first examination, a soft 5.5 cm x 4.5 cm swelling was found in the left submandibular region (Fig. 1). There was no significant abnormality relating to the floor of the mouth or to the major salivary glands. CT examination revealed a smooth, irregularly shaped, lobulated lesion located in the left submandibular space (Fig. 2). The viscous fluid aspirated from the swelling had a high amylase level (250 IU/L). The left sublingual gland was totally

Figure 1. A swelling of the left submandibular region.
Ken-ichi Kaneko: Plunging Ranula

removed with evacuation of the fluid from the cyst via an oral approach under general anesthesia (Fig. 3). Fifteen months later, there is no evidence of recurrence.

**Discussion**

The ranula is a pseudocyst resulting from extravasation of saliva from the sublingual salivary gland. It consists of an accumulation of mucus within the connective tissue and doesn't have an epithelial lining.

The plunging ranula is located below the mylohyoid muscle and may present as a painless, soft, and fluctuant swelling located mainly in the submandibular space. Rarely, it can extend to the parapharyngeal space because the anteroinferior aspect of the parapharyngeal space is located posteriomedially to the submandibular space.

The plunging ranula needs to be distinguished from cystic hygroma, hemangioma, dermoid cyst, branchial cleft cyst, thyroglossal duct cyst and lipoma, because the treatment for each is different. For the diagnosis of the plunging ranula, examination using CT and MR imaging, and analysis of the aspirated cyst fluid are useful.

On CT and MRI scans, a plunging ranula is a well-circumscribed and homogeneous lesion that extends from the submandibular space to neighboring spaces, such as the submental and parapharyngeal spaces. We consider an irregularly shaped lesion, such as that seen in this case, to strongly suggest a plunging ranula, because ranulas lack epithelial linings, and are a result of saliva escaping to any potential space. Charnoff, et al. wrote that the plunging ranula is usually a single cavity, but in this case, the CT scan suggested a thin septum in the cystic lesion. During the operation, we unfortunately couldn't identify the septum, and we had no difficulty in evacuation of the entire fluid of the cyst. Nonetheless, it seems possible that there are some cases in which a ranula has a septal structure that is visible with imaging, which we suppose to be made of connective tissue.

The cyst fluid of a ranula shows very high viscosity and raised levels of amylase, similar to secretions of the salivary gland. Analysis of fluid therefore helps in making a correct diagnosis preoperatively. The aspirate from the swelling in our case was also viscous and showed a high amylase level, and so strongly suggested that it was a ranula.

Various procedures have been reported for the treatment of a plunging ranula: incision and drainage, marsupialization,
cervical excision of the cysts, cervical excision of cyst combined with excision of the sublingual gland\textsuperscript{1,3,7,8}, cervical excision of cyst combined with excision of the submandibular gland\textsuperscript{5}, cervical excision of the sublingual and submandibular glands\textsuperscript{5}, transoral excision of the sublingual gland\textsuperscript{6,7,9} radiation therapy to the neck, injection of OK-432\textsuperscript{10}, and so on. Parekh, et al.\textsuperscript{6} showed that the recurrence rate was 70\% after incision and drainage of the cyst, 53\% after marsupialization, 85\% after excision of the cyst in the neck, and 2\% after excision of the sublingual gland via the cervical or transoral route. These results indicate that excision of the sublingual gland is the best treatment for a plunging ranula, which is consistent with its etiology as an extravasation cyst of the saliva from the sublingual gland. Extensive dissection of the pseudocyst is unnecessary. Furthermore we consider the transoral approach superior to the cervical approach for the removal of the sublingual gland because of the accessibility to the sublingual gland, the lack of scar formation on the skin, and the lack of danger of facial nerve paralysis with the transoral approach. The incidence of paralysis of the marginal mandibular branch of the facial nerve is high after cervical incision\textsuperscript{7}. Patal, et al.\textsuperscript{7} also concluded in their retrospective review that definitive treatment yielding lowest recurrence and complication rates was transoral excision of the ipsilateral sublingual gland with ranula evacuation.

Conclusions

The essentials of management for the plunging ranula are accurate preoperative diagnosis using imaging and fluid analysis, followed by simple excision of the sublingual gland via an oral incision.

References
