MANAGEMENT OF SIALOLITHIASIS IN THE SUBMANDIBULAR SALIVARY GLANDS: A CASE REPORT

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ABSTRACT Introduction: Sialolithiasis or salivary calculus is a salivary gland disease characterized by mineralized structures in the excretory salivary ducts or glandular parenchyma. About 80% occur in the submandibular glands, followed by the parotid glands and sublingual salivary glands. Although sialolithiasis can occur in the minor salivary glands, they can develop in any region of the oral cavity containing the minor salivary glands. Case report: A 78-year-old female patient presented with complaints of pain and lumps in the lower left jaw, which have often occurred since 2 years ago. The lump gets bigger when eating spicy food and gets smaller when taking antibiotics, and then the patient is treated for sialodenectomy and sialolithectomy. Discussion: History, clinical examination, and investigations in patients with sialolithiasis are important to determine the appropriate treatment. Surgical management of sialolithiasis of the salivary glands has been recommended to reduce the likelihood of recurrence compared to more conservative approaches. Therefore it is the treatment of choice for these lesions. Conclusion: Salivary gland sialolithiasis is a rare occurrence, which may present diagnostic difficulties due to similar clinical characteristics with other lesions. Surgical management is performed to prevent sialolithiasis from growing bigger.

KEYWORDS Sialolithiasis, sialodenectomy, sialolithectomy

Introduction
Sialolithiasis of salivary calculus is a salivary gland disease characterized by mineralized structures in the excretory salivary ducts or glandular parenchyma. It is usually associated with swelling, pain, and infection of the affected gland resulting in salivary ectasia. Sialolithiasis is the most common disease of the major salivary glands after mumps and accounts for about 30% of all salivary disorders. About 0.01-1.0% of the population is affected, with a higher incidence in men aged between 30 and 60 years. More than 80% of salivary sialolithiasis occurs in the submandibular duct or gland, about 6-15% occurs in the parotid gland, and about 2% is in the sublingual and minor salivary glands. Sialolith occurs due to the interaction between saliva precipitated by a group of bacteria, which gradually becomes stones. Stones that remain and calcify in the salivary gland ducts may get bigger and block the salivary gland canals completely.[1,2]

The aetiology of sialolithiasis formation consists of several factors: mechanical, inflammatory, chemical, neurogenic, and infectious. The saliva contains alkaline, viscous, mucus rich saliva, with a higher percentage of calcium phosphate as in the submandibular salivary glands, which supports the formation of sialoliths. In addition, Wharton’s long and tortuous position also plays a role in making the submandibular salivary glands more susceptible to sialolith formation compared to parotid glands. It is known that systemic diseases (gout, Sjögren’s), drugs (anticholinergics, antisialogues), local trauma, head and neck radiotherapy, aging, and kidney disorders may predispose

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patients to the formation of sialoliths in the salivary glands.[3]
Surgery shows a higher efficacy in terms of successful therapy compared to conservative means. Complications can be eliminated by removing the salivary gland obstruction because a long blockage may result in fibrosis of the salivary glands and chronic sialadenitis.[4]

Case report
A 78-year-old female patient came to the Oral and Maxillofacial Surgery Department of Hasan Sadikin Hospital with complaints of a lump in the back of the left lower jaw. The swelling had often occurred since +/- 2 years ago. The swelling gets bigger when the patient eats spicy food and dissipate after taking antibiotics from the health centre. Approximately 2 months before admission to the hospital, the patient complained of swelling in the left lower jaw. A few days later, the swelling got bigger and painful when swallowing, accompanied by a salty and yellow discharge from the mouth. The patient was brought to RSHS, and an extraoral and intraoral drainage incision was performed. Extraoral examination showed swelling in the left submandibular area (Figure 1), and intraoral examination showed a lump on the surface of the lingual mucosa around tooth 36 with a firm consistency and the size of 5x2x2 cm with a clear border (Figure 2). Thorax examination showed no bronchopneumonia and no cardiomegaly (Figure 3), AP Schdele examination showed an opaque linear with metal density image in the left mandible (Figure 4). Sialography examination revealed a sac-shaped lesion in the left submandibular (Figure 5).

The treatment plan was to perform sialoadenectomy and sialolithectomy with an extra-oral approach under general anaesthesia, followed by a cutis incision in the left submandibular region and the muscles layer by layer using blade no.15, cautery, tissue scissors, and artery clamp until the left submandibular salivary gland was visible. Then the muscle tissue was separated from the left submandibular salivary gland using the artery clamp and cautery and followed by binding of the blood vessels, separation of the sublingual and submandibular salivary glands, separation of the mucosal tissue with rasparatorium and artery clamps, followed by removing the sialolith and granulation tissue in the cavity, and irrigation of the cavity with 0.9% NaCl solution (Figure 6). The binding of the left submandibular gland duct, cutting the submandibular gland from the mucosal tissue with cautery, and removal of the left submandibular salivary gland (Figure 7).

Discussion
Sialolith is a calcification that develops in the salivary duct system. This sialolith is believed to originate from the deposition
The diagnosis of salivary gland stones is easy when they are located in the distal, which is the oral part of the duct. Sialoliths are usually found in the mandibular duct at the floor of the mouth, can be seen or felt, or can be photographed radiographically. Sialoliths can also occur in the minor salivary glands. The shape of the stone varies significantly in terms of size, shape, and ability to drift into the lumen or adhere to the duct walls. Pain may arise due to trauma to the duct and food that stimulates salivary secretion. Other possibilities that can occur due to obstruction of these ducts can lead to infection, pain, and injury to the gland. Treatment for small sialolithiasis includes massaging the sialolith stones in the gland towards the duct, but if the stones are large, the treatment chosen is the surgical removal of the stone. There is a new method in dealing with sialolith stones known as salivary gland endoscopy. However, in this case, the management chosen was the usual method due to the hospital’s limited facilities.

The management of salivary gland stones depends on the duration of symptoms, the number of recurrences, the size of the stone and the location of the stone and the gland involved. Submandibular salivary gland stones can be classified based on their location as anterior and posterior to the transverse line between the first molars. Stones located anteriorly are easily visualized using occlusal radiographs and may be removed without surgery, such as dilating the Wharton duct with a lacrimal probe. However, this action must be done carefully so as not to push the stone more posteriorly. The gland is then massaged to release more saliva or by providing salivary stimuli such as citric acid, candy with various flavours or glycerin.

If conventional efforts are unsuccessful, an incision can be made on the floor of the mouth so that the duct is exposed.
and the stone can be removed easily. If the submandibular salivary gland stone is located posteriorly or is located in the hilum of the gland or in the submandibular gland itself, the submandibular gland and the stones inside can be removed with an extraoral approach by making an incision approximately 2 fingers below the edge of the mandible by separating and ligating the anterior facial vein, while the superior flap is lifted to protect the marginal mandibular nerve. In accordance with this theory, in this patient’s case, the removal of the sialolith and the left submandibular gland was performed.[2,7]

Diagnostics and therapy of salivary gland stones have been carried out since decades ago, although sialoliths are often misdiagnosed. Hence they do not get adequate treatment, especially for small sialoliths. Sialography is very helpful to estimate gland function in conditions with partial ductal obstruction. Moreover, ultrasonography is a simple and convenient method so that doctors can show sialoliths with 100% accuracy. In this case, a large sialolith can be seen on radiographs.[7]

In this case, the sialolith was found at the base of the mandibular corpus bone around teeth 36 and 37. The treatment of choice was the removal of the stones or sialoadenectomy with an extraoral approach. The surgical procedure was performed because the sialolith stones were already large and located close to the submandibular gland. The removal was done by making an incision 2 fingers away from the mandibular margin, and then the sialolith stone was removed with a clamp. The stone that was removed had a length of approximately 5 cm. After removal, suturing was performed, then the submandibular gland was removed as well.[8]

**Conclusion**

The oral cavity can produce about 1000-1500 ml of saliva every day. However, the secretory nature of the glands makes these glands very susceptible to various things that can obstruct the normal flow of saliva. One of them is a blockage due to the formation of salivary stones or sialolithiasis. Calcium deposits form this sialolith stone. These salivary stones are most often found in the ducts of the submandibular glands. Men experience them more often than women. The treatment for this condition is massaging the stones. However, the main treatment is the surgical removal of the stones. By removing this sialolith stone, the patient will feel comfortable because there is no more disturbing pain. The case of sialolithiasis in this patient was diagnosed based on the clinical symptoms and supporting an examination of sialography. The choice of surgical therapy, namely sialoadenectomy and sialolithectomy, is based on the consideration of the location of the sialoliths, which are posteriorly and close to the submandibular gland.

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**Conflict of interest**

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**References**


