Sialolith- The Story of A Stone : A Case Report

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Introduction

Sialolithiasis is the most common cause of salivary gland obstruction. Obstruction can be complete or partial and may cause recurrent symptoms. The retained saliva exerts retrograde pressure on the salivary gland, and may cause transient or total damage to the parenchyma and the ductal system.[1]

Sialolith is one of the most common forms of pathologic conditions found in the salivary glands. Sialoliths frequently occur in the submandibular gland (80% to 90%), whereas 5% to 20% are located in the parotid gland.[2] Although large sialoliths have occasionally been reported in the salivary gland, they have rarely been reported in the salivary ducts.

Case Report

The patient, a 54 year old man, appeared for evaluation and treatment of intermittent, dull, aching pain and swelling in his left submandibular area. The symptoms had been present for 2 to 3 months. This phenomenon occurred 2 to 3 times per day, during meals. Lime test was performed, and was found to be positive. The patient noted that sour food was more likely to produce symptoms than were other types of food. His health history was unremarkable, and there was no history of any systemic illnesses or of previous hospitalization.

On examination, he was found to have a firm mass 1 cm in diameter on the floor of his mouth, along the course of the left submandibular duct. The mass was slightly tender. It was bimanually palpable. Saliva was noted to flow from the orifices of the submandibular ducts on both sides when the glands were massaged. The left submandibular gland measured 1 cm by 2 cm; the right submandibular gland measured 0.8 cm by 1 cm. Both submandibular glands were nontender. The patient was afebrile, and his vital signs were normal. The rest of the findings of the physical examination were unremarkable. On the basis of the history and physical findings, a clinical diagnosis of right Submandibular Sialolithiasis was made.

A plain radiograph of the left half of the mandible and floor of the mouth showed a large radiopaque calculus in the floor of the mouth. A left submandibular sialograph showed complete obstruction of the left submandibular duct by a radiopaque calculus 2 cm from the orifice of the duct.

After induction of local anesthesia, the left submandibular duct was sutured along with the mucosa distal to the location of the sialolith.

The duct orifice was traced with a lacrimal probe, and an incision was made through the oral mucosa and the duct along the course of the left submandibular duct. The duct was dissected to expose the large calculus. The calculus was freed with difficulty by blunt dissection and removed from the left submandibular duct. A cannula was inserted into the duct and sutures were placed using 3-0 bbs only on the mucosa sparing the duct. The purpose of placing the cannula was to maintain patency of the duct and to prevent fibrosis, The cannula would be removed after 7 days.

The calculus was yellow in color. It measured 15 × 6 mm and weighed 0.54 g. Minute cracks were seen on the surface of this calculus. Chemical analysis showed it to be an admixed mass of microcrystalline hydroxyl and carbonate apatites, protein, and cryptocrystalline tricalcium phosphate.

Discussion

Obstructive salivary gland disease is one of the most common problems that afflict salivary glands and is a major cause of salivary gland dysfunction and sialoadenectomy.

Sialoliths located in Wharton's duct or in Stensen's duct are the most frequent cause of obstruction and consequent acute or chronic infection.[3]

Salivary calculi are usually unilateral in occurrence and round to oblong, have an irregular (majority) or smooth surface, vary in size from a small grain to the size of a fruit seed, and are usually yellow. The stones may occur in the duct or gland, with multiple stones not uncommon. They are found more often in adults, although they also occur in children. The classic symptoms are that of obstruction manifested by pain and swelling of the involved gland during eating. Since obstruction is rarely complete, the gland swelling will subside to some degree during rest periods.

Stones apparently develop as a result of an initial organic nidus followed by the deposition of inorganic material, both of which are derived from the salivary fluid. The filamentous stroma or nidus is not bacterial in nature but rather precipitated mucoids and possibly salivary proteins.[4]

Submandibular sialoliths are more common than those of the parotid for a number of reasons. Anatomically, the submandibular duct is longer than the parotid, traversing upward and forward from the gland to the oral floor, whereas Stensen's duct moves in a horizontal direction. In addition, there is diminution in the calibre of Wharton's duct with a corresponding decrease in wall thickness compared with the parotid. Salivary stasis is also facilitated by the fact that the orifice of Wharton's duct is much narrower than that of Stensen's duct. There is one other region in the submandibular duct that is conducive to salivary stasis, and the "comma area," where the duct takes a radical turn inferiorly behind the posterior border of the mylohyoid muscle as it approaches the hilus of the gland. Regarding salivary viscosity, submandibular saliva is more than twice that of the parotid because of its mucus content.[4]

A small sialolith that enables saliva to flow through Wharton's duct may cause no symptoms, while a temporary occlusion of the duct by a larger stone may initiate intermittent pain and swelling in the submandibular region. When the sialolith reaches a size to obstruct the passage completely, the secretion in the gland is hampered because of pressure. This condition leads to destruction of the gland.[2]

Sialoliths are composed of a variety of

organic and inorganic substances. The organic substances are glycoproteins, mucopolysaccharides, and cellular debris, while the inorganic substances are mainly calcium carbonates and calcium phosphates. There are several hypotheses regarding the pathogenesis of sialolithiasis. The first theory is based on the existence of intracellular microcalculi, which when excreted in the canal become a nidus for further calcification. The second theory is based on the existence of mucous plugs, which are present in the ductal system and represent the nidus. There is an initial organic nidus that progressively grows by the deposition of layers of inorganic and organic substances. Another possibility is that aliments, substances, or bacteria within the oral cavity migrate in the salivary ducts and become the nidus for further calcification.[5]

Giant salivary calculi (>15 mm) are rare. Although large sialoliths have been described in the body of salivary glands, they are rarely found in the salivary ducts, particularly when the patients have no painful symptoms.

For intraductal stones, a transoral approach is adequate, whereas for intraglandular stones, an extraoral submandibular gland excision is indicated. Intraoral sialolithotomy carries fewer risks than surgical glands removal, such as the risks of a surgical scar, facial nerve damage, and Frey's syndrome.[6]

References

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Legends

Fig. 1 Extraoral appearance
Fig. 2 Lime test
Fig.3 Sublingual swelling
Fig. 4 Occlusal view
Fig. 5 Tracing Wharton's Duct
Fig. 6 Milking the duct
Fig. 7 Sialolith exposed
Fig. 8 Measurements

Fig. 1

Fig. 2

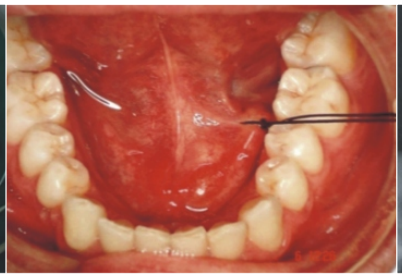

Fig.3

Fig. 4

Fig. 5

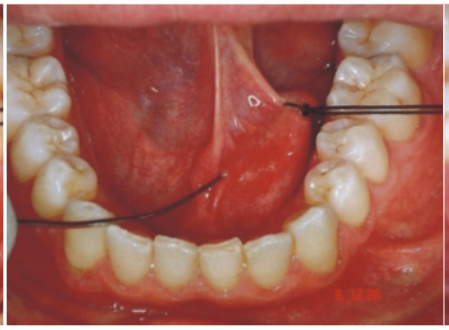

Fig. 6

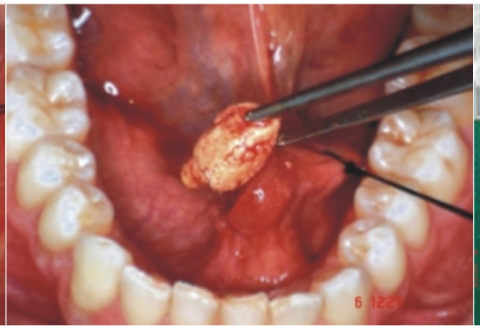

Fig. 7

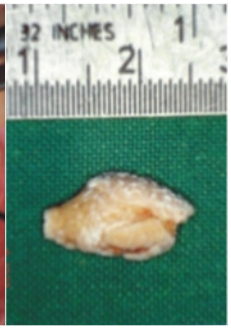

Fig. 8