Clinical presentation of salivary calculus in the submandibular gland

Introduction

Sialolithiasis is one of the most common conditions that causes obstructive sialadenitis. It’s known by the development of salivary stones (calculi or sialoliths) in the salivary ducts or affected salivary glands (1). sialolithiasis usually occurs from the third to the fifth decade of life with an estimated frequency of 1. 2% and a slight male predominance. only 3% of cases are reported from pediatric population (2). due to the greater amount of proteins and subsequently concentration of calcium in saliva in addition to longer course and angulation of Wharton’s duct 80% to 90% of sialoliths occur in the submandibular gland, followed by 5% to 20% in the parotid gland and rarely (1% to 2%) in the sublingual gland and the minor salivary glands (3). In comparison to intraglandular stones, intraductal stones are more common. single stones present in the most patients but multiple stones are reported in 32% of cases in the parotid gland and 22% in the submandibular gland (4).

Swelling and pain are the most frequent clinical presentation in the area of affected gland. Because of enhanced salivary secretion, swelling is more obvious during meals. Sialoliths can often be detected on palpation when they are located above the mylohyoid muscle or in the buccal mucosa and lips (5, 6). The severity of pain and swelling is associated with the degree of obstruction and residual duct patency. Inflammation, infection, restricted mouth opening and purulent discharge can occur occasionally (3). Panoramic and occlusal radiographs are generally used to help with diagnosis however, 40% of parotid and 20% of submandibular stones are not radiopaque and sialography may be required to locate them (7).

Sialoliths consist of mainly calcium phosphate with smaller amounts of carbonates in the form of hydroxyapatite, and a few amounts of magnesium, potassium and traces of ammonium. The organic material is composed of various carbohydrates and amino acids (8). The size of sialoliths may vary from less than 1 mm to a few cm in largest diameter but only 7. 6% of them are larger than 15 mm in size. In literature, giant sialoliths are classified as those beyond 35 mm in any one dimension (9).

Small sialoliths positioned near the orifice of the duct can be spontaneously excluded by stimulating the salivary flow with performing local massage or it may be removed subsequent to a widening of the orifice with a lacrimal probe. However, major surgical procedures, such as lithotripsy, sialadenectomy, and sialotomy are needed for multiple or gigantic cases (10, 11). Sialendoscopy allows diagnostic examination and stone removal with gland preservation and thus, it has increased a great approval(12, 13).

This article reports a case of salivary calculus of uncommon size in the submandibular gland and discuss the clinical presentation of this case.

Case report

A 60-year-old edentulous female patient reported swelling in the right submandibular region of an almost 4-year duration which was recently caused mouth floor infection. The patient complained of dysphagia and odynophagia but she had no pain or discomfort during meals. During extra oral physical examination there was no manifestation of swelling or tenderness. Intraoral examination revealed swelling, redness and inflammation in the anterior right side of the oral floor of the mouth. A

computed tomography scan was taken which showed a radiopaque mass measuring approximately ? mm in the right internal submandibular region. Based on the clinical and imaging findings a diagnosis of a sialolith associated with the distal section of the Wharton’s duct was made.

Discussion

Salivary calculi’s mean size is reported to be 6 to 9 mm. Sialoliths are rarely more than 1. 5 cm and those with the size of 3. 5 cm or larger are defined as giant ones. The largest sialolith reported in the literature was described as “ hen’s egg” size, had 7 cm length and was located in the Wharton’s duct (14). Large sialoliths are a result of affected duct response as Soares et al said, if the duct adjacent to the sialolith is able to dilate, the condition may remain asymptomatic for a long period of time. Thus, dimensions of the sialolith may growth without any symptoms (15). Giant sialolith may causes a perforation of the floor of the mouth by ulcerating the duct or a skin fistula by causing a suppurative infection. In small-sized Sialoliths, as slow calcification of the stone often does not block the flow of saliva completely, the most common symptoms are recurrent pain and swelling of the involved gland during meals. large Sialoliths are frequently founded in the body of salivary glands and have rarely been described in the salivary ducts, specially without any complaints from the patients (13). In this report, clinical and radiological characters of a large sialolith which was ? mm in the size was presented. It was located into Wharton’s ducts and the patient had no complains of pain. The patient referred for inflammation caused by complete denture irritation which was discovered that the main reason was a large sialolith in the floor of the mouth remained asymptomatic for almost 4 years during its evolution.

Salivary calculi are principally consisting of calcium phosphate with small amounts of carbonates in the form of hydroxyapatite. Some amounts of magnesium, potassium, and ammonia are found in sialoliths too (16). Infection, inflammation of the gland, physical trauma to the duct or its orifice, and the presence of desquamated epithelial cells are some factors which seem to have a part in the development of salivary stones (17) . according to Ledesma-Montes et al and Bonder studies, salivary proteins might play a key role in sialolith formation and some factors may be in charge for the higher rate of calculi formation in the submandibular gland in comparison with that in the parotid gland. Specifically, the submandibular excretory duct is wider and longer in dimension than the Stensen duct. Also, the salivary current in the submandibular gland is against gravity. Furthermore, the combination of secreted saliva is different as submandibular saliva is more alkaline and contains a higher quantity of mucin proteins and calcium and phosphate content (14, 17)

Giant sialoliths are generally radiopaque so they are simply detectable on panoramic and standard occlusal radiographs, which are the most reliable methods of viewing the submandibular sialoliths. Infrequently they could be misdiagnosed as included teeth or a pathologic lesion because of their curious shape and radiographic location.

The purpose of treatment in these cases is to restore normal salivary secretion. As Rai and Burman said a giant sialolith should be removed in a minimally aggressive way, by transoral sialolithotomy, to decrease morbidity caused by sialadenectomy (16). Sialodochoplasty is a low-risk surgical procedure reduces the length of the duct and the gravity for the salivary flow

thus eliminates many factors that could lead to the formation of new sialolith. Longstanding obstruction may result in a salivary gland sialadenitis and subsequently a fibrotic and atrophic gland (18). Based on Soares et al's study, intraductal stones a transoral approach is indicated, however for intraglandular stones, an extraoral submandibular gland removal may be necessary (15). Diagnosis and management of sialoliths of an outstanding size are challenging for the clinician. Conservative methods of treatment can be taken in to consideration such as extracorporeal and endoscopic intracorporeal shockwave lithotripsy techniques as alternative for surgical excision, especially for small-sized cases (19).

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