

SUBMANDIBULAR SIALOLITH OF AN UNSUAL SIZE: A CLINICAL REVIEW

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Abstract

Sialolithiasis accounts for the most common cause of diseases of salivary glands. Sialoliths are calcified structures that mainly occur in the submandibular gland or the Wharton's duct. The size varies from one mm to one cm. Size greater than 15 mm are considered unusual or giant sialolith. In present article, a case of an unusual size salivary stone of 18.5 mm in submandibular gland duct which was removed via transoral incision. The aim of this paper is to understand etio-pathogenesis, clinical presentation and management of submandibular sialolithiasis along with the clinical review of previous studies comparing with the present case study.

Keywords: Sialolithiasis, Wharton's duct, Transoral sialolithotomy

Introduction

Sialolithiasis is the most common disease of salivary glands.^{1,2} It is with estimated frequency of 1.2% in the adult population where males are affected twice as much as females.^{2,3} Salivary stones can occur at almost any age, but they are most common in young and middle-aged adults.^{1,2,4} Sialoliths are calculi or stones, most often develop within the ductal system of the submandibular gland.^{5,6} Most sialoliths (80–90%) develop in the submandibular gland and about 5–10% develops in the parotid gland and the remainder in the sublingual and minor salivary glands.^{2,5,6} The reasons for commonest involvement of submandibular gland and its ducts are, tenacity of submandibular gland saliva, which because of its high mucin contents adheres to any foreign particles and the duct of this gland is long, tortuous, & upward in its course.^{2,6,7}

The shape of sialolith may be round, ovoid or elongated with yellow color. The involved duct may contain one or more stones. Calculi generally consist of mixture of calcium phosphates, calcium carbonates together with an organic matrix.^{1,3,5,7}

Commonly, sialolith measures from 1 mm to less than 1 cm but sialolith rarely measure more than 1.5 cm.^{1,2,4} These salivary stones are called as unusual or giant sialolith.^{2,3,5,8} The aim of this paper is to present an intraoral approach to evacuate an unusually sized sialolith measuring 1.85 cm along with the clinical review of previous studies.

Case report

A 52-year-old female patient reported to the department of Dentistry at Shaheed Hasan Khan Mewati Government Medical College, Nuh, Haryana. The chief complain of patient was pain and swelling in the floor of the mouth on right side for 5 months. She gave a history of intermittent increase in swelling in the early morning and while eating, which later subsides on its own. There was no associated history of fever, malaise, or burning sensation in the oral cavity.

Extraoral examination revealed mild swelling in right submandibular region with no other significant findings.

Intraoral examination revealed a swelling of 2 x 1 cm extending in right floor of the mouth from lingual frenum to the second premolar region. [Figure 1]

On palpation, the swelling was found to be hard in consistency and tender. The mass was not fixed to the underlying structures and it was not pulsatile. Purulent discharge was detected from the duct orifice on pressing along with blanching of surrounding mucosa.



Figure 1: Intraoral palpation.

Radiographic examination with an occlusal radiograph revealed a radiopaque mass of size 1.85 x 1 cm extending antero-posteriorly and mediolaterally from the mandibular lateral incisor region to premolar region in the floor of the mouth, suggestive of a giant sialolith. [Figure 2] On measuring the salivary stone on radiograph was about 19 mm long.

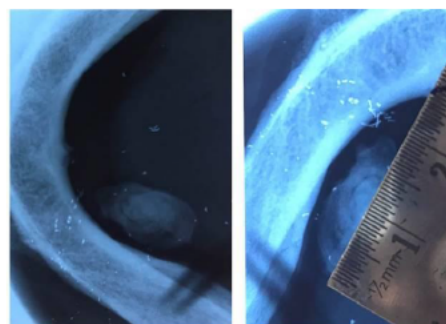


Figure 2: Occlusal Radiograph

At the start of transoral sialolithotomy surgery, scrubbing of the surgical field was done followed with induction of

local anesthesia. The retraction suture was placed around the duct distal to the stone, which was then retracted anteriorly. [Figure-3]

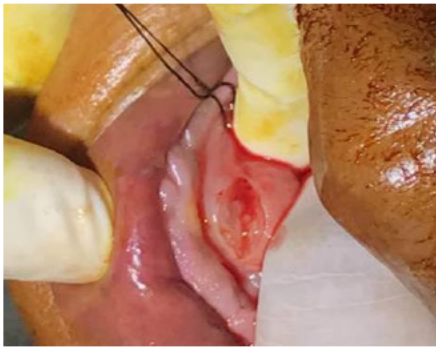


Figure 3: Retraction suture placed distally and mucosal incision made.

A longitudinal mucosal incision followed with careful dissection of the tissues was done to locate under lying sialolith. [Figure 4]

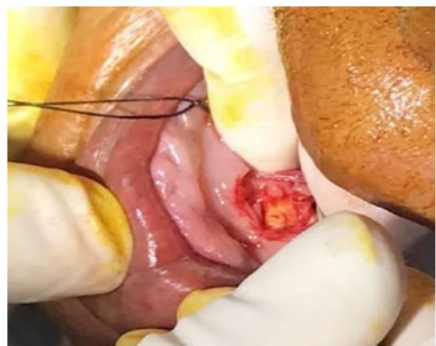


Figure 4: Sialolith evacuated from the duct.

The sialolith was removed with care taken not to injure the lingual nerve. The exposed stone was grasped with the tissue forceps and gently teased but it was broken indicating non-sticky inorganic composition of stone. The stone was removed in multiple pieces of variable size. [Figure 5]



Figure 5: Sialolith of big size removed in fragments

Saline irrigation and milking of the gland was done to remove any small residual stones or mucin plugs. Cannulation of the duct with intravenous catheter (22

gauge) was done and sutured with 3-0 vicryl sutures. [Figure-6]



Figure 6: Cannulation of duct with intravenous catheter of 22 gauge.

The postoperative instructions were given to patient and asked to come subsequently for next seven days for irrigation. The healing was found to be satisfactory with normal salivary flow.

Discussion

Sialolithiasis is among the most common disease of the salivary glands with a peak incidence in 4th to 6th decades of life. In literature, all the patients reported were older than 42 years and so same in present study except the case by Ledesma Montes where patient was 34-year-old.^{3,5,9} Sialolithiasis is rare in children whereas, Steiner reported a case of salivary stone in an 8-year-old child.¹⁰ It was shown that Males are more affected than females but in the present case, the female was shown up with a large sialolith.^{1,6}

Salivary stones over 10 mm are reported as unusual in size. In previous studies about salivary stones, the size of giant sialoliths was found ranging from 15mm to 72mm.¹ In present case, the stone size was about 18.5 mm long and 10.2 mm wide. The largest stone has been reported by Rai and colleague which was 72mm in size.²

The exact etiology and pathogenesis of salivary calculi is unknown.^{1,5,6} However, salivary stagnation, increased alkalinity of saliva, infection, inflammation or physical trauma to salivary duct or gland may predispose to calculus formation.^{3,6} According to Harrison et al, the formation of the nucleus of sialolith is related to the duration of symptoms of sialadenitis. According to them during chronic submandibular sialadenitis inflammatory swelling may lead to the partial obstruction of a large duct with stagnation of secretory material rich in calcium. This may form a calcified core and later when this grows, it would become a sialolith.¹¹

In a previous study by Yu et al where he reported that there is one special structure like a sphincter-like mechanism or muscle like structure in the wall of gland duct. It has a valve-like function to prevent the foreign body from entering the duct, which can be related to the formation of sialolith in the submandibular gland.¹²

According to Marchal, there is another basin-like special structure in submandibular gland, that may slow down the flow of saliva and cause the sediment of inorganic substance to sink and induce gradual formation of a sialolith.¹³

In present study, this is a single case presented but a huge number of patients with salivary stones comes to departmental OPD. This may be attributed to high salt content and hardness of water in this region but recently, Sherman and McGurk showed that water hardness is not significant associated with the incidence of salivary calculi.¹⁴

The severity of the symptoms varies, depending on the degree of obstruction and the amount of resultant backpressure produced within the gland.^{1,7,9} Symptoms of sialolithiasis may include painful swelling with difficulty in opening mouth and swallowing and dry mouth. In a study by Levy *et al*, 5% of the patients with submandibular stones had asymptomatic, discrete masses, which in few instances were suggestive of neoplasm on physical examination.¹⁵ In present study, the swelling was present as a discrete mass but not asymptomatic.

The diagnosis can be made by history, physical examination and using Ultrasonography, X-rays (most commonly occlusal radiographs or OPG), Sialography or CT scan. Small stones especially which are radiolucent can be diagnosed by investigations like Computed tomography, sialography or ultrasonography.^{1,2,3,6} In our case, the stone was large radiopaque mass and was clearly visible on occlusal radiographs so no further investigations were needed.

Treatment for salivary stone depends upon the size and position of stones and ranges from application of moist warm heat with gland massage, use of sialagogue, and transoral removal to complete gland removal (sialoadenectomy). Other methods of treatment include shock wave lithotripsy, sialoendoscopy, interventional radiology, laser fragmentation and endoscopically assisted transoral removal.^{6,9,14} Submandibular duct catheterization and dilatation or removal by manipulation becomes first choice for small sialoliths located near the orifice of the submandibular duct. In this case, the transoral sialolithotomy method was chosen as it provides with minimal surgical intervention and quick recovery.

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