SUBMANDIBULAR GLAND SIALOLITHIASIS
A CASE REPORT

Abstract:
Sialoliths are calcified organic matter that forms within the secretory system of the major salivary glands. Salivary gland calculi are the most common disease of the salivary glands and may range from tiny particles to several centimeters in length. The majority of sialoliths occur in the submandibular gland or its duct and is a common cause of acute and chronic infections. While the majority of the salivary stones are asymptomatic or cause minimal discomfort, larger stones may interfere with the flow of saliva and cause pain and swelling. This case report describes a patient presenting with a submandibular gland sialolith and the subsequent non-surgical management of the patient.

Keywords: Submandibular salivary gland, Sialolith, Warthins duct.

Introduction:
Salivary duct obstruction secondary to sialolith is a common disorder of the submandibular gland and often manifesting as painful episodic swelling of the gland during meals. Complications may arise in unresolved obstruction leading to infections, abscess formation and a hypofunctioning gland[3]. It is estimated that it affects 12 in 1000 of the adult population. Males are affected twice as much as females4. Children are rarely affected. Sialolithiasis accounts for more than 50% of diseases of the large salivary glands and is thus the most common cause of acute and chronic infections.[2] More than 80% occur in the submandibular gland or its duct, 6% in the parotid gland and 2% in the sublingual gland or minor salivary glands. Multiple calculi in the submandibular gland are rare, as is simultaneous lithiasis in more than one salivary gland.[2] Forty per cent of parotid and 20% of submandibular stones are not radiopaque and sialograph may be required to locate them.[4] Clinically they are round or ovoid, rough or smooth and of a yellowish colour. They consist of mainly calcium phosphate with smaller amounts of carbonates in the form of hydroxyapatite, with smaller amounts of magnesium, potassium and ammonia. This mix is distributed Evenly throughout. Submandibular stones are 82% inorganic and 18% organic material Whereas parotid stones are composed of 49% inorganic and 51% organic material.[5] The organic material is composed of various carbohydrates and amino acids.[6] Bacterial elements have not been identified at the core of a sialolith.

Case Report:
A 60 year old male patient reported to the Department of Oral Medicine and Radiology, Institute of Dental Sciences, Bareilly with the chief complaint of swelling was moderate to severe in nature and intermittent. Pain increases with intake of food and relieved on medication. There was history of such swelling 1 year back. For which he took medication and got relieved. Now On intra oral examination, Bilateral swellings were present in the floor of the mouth, measuring about 4x3 cms in the left and right floor of the mouth , extending 2 cm from the lingual frenum to the first molar region mesio-distally. Wharton duct orifice was inflamed. Swelling was firm in consistency with some hard areas on left side of the floor of mouth. It was tender on palpation. On milking the gland pus discharge was seen through the ductal orifice. Tongue was raised. Patient was completely edentulous and has difficulty in wearing denture.

Considering the history and examination a provisional diagnosis of a submandibular Sialolith with secondary Bacterial infection of the submandibular salivary gland was given. Mandibular true occlusal radiograph was advised which showed a radiopaque area of 0.6 x 0.9 mm in size mesial to the body of the mandible on left side. A non surgical management by giving salivary supplements, hydration and simultaneous milking of the gland from posterior to anterior direction pushing the calculi towards the orifice was planned. Calculi was easily retrieved from the orifice .Patient put on antibiotics Amoxycillin-Clavulunic Acid 375mg tds was given to the patient for 1 week. Patient was recalled after 1 week for follow up and swelling was completely subsided.

Discussion:
The deposition of calcium salts, primarily calcium phosphate, usually occurs in the skeleton. When it occurs in an unorganized fashion in soft tissue, it is referred to as heterotopic calcification. Heterotopic calcification which results from deposition of calcium in normal tissue despite normal serum calcium and phosphate levels is known as idiopathic calcification. Sialoliths belongs to the category of idiopathic calcification.[2] Sialoliths are calcareous deposits in the ducts of major or minor salivary glands or within the glands themselves. Sialolithiasis accounts for more...
than 50% of diseases of the major salivary glands and is thus the most common cause of acute and chronic infections.[5]

Careful history and examination are important in the diagnosis of sialolithiasis. 80%-82% of sialoliths occur in sub mandibular gland. Sialolith form more frequently in submandibular gland because of more alkaline, thicker and viscous saliva the submandibular gland produces. Other factors that predispose to stasis in Whartons duct (eg an uphill course, a dependent gland, a wider lumen and a tighter orifice) may play a role as well. Calculi may be multiple (25%) and may occur within intraglandular ductal tributaries or within the main ducts. When in the gland itself, the symptoms may be relatively minor whereas ductal sialoliths usually have more precipitous presentations. [2]

The exact etiology and pathogenesis of salivary calculi is unknown. They are thought to occur as a result of deposition of calcium salts around an initial organic nidus consisting of altered salivary mucins, bacteria and desquamated epithelial cells.4According to the literature, formation of sialolith can occur in two phases: a central core and a layered periphery. The central core is formed by the precipitation of salts, which are bound by certain organic substances. The second phase consists of the layered deposition of organic and inorganic material. Parotid stones are thought to form most often around a nidus of inflammatory cells or a foreign body1 whereas Submandibular stones are thought to form around a nidus of mucous. Another theory has proposed that an unknown metabolic phenomenon can increase the salivary bicarbonate content, which alters calcium phosphate solubility and leads to precipitation of calcium and phosphate ions.1 A retrograde theory proposed for sialolithiasis suggested that, substances or bacteria within the oral cavity might migrate into the salivary ducts and become the nidus for further calcification. Salivary stagnation, increased alkalinity of saliva, infection or inflammation of the salivary duct or gland, and physical trauma to salivary duct or gland may predispose to calculus formation.1 Patients presenting with sialolithiasis may benefit from conservative management, especially if the stone is small.1 The patient must be well hydrated and the clinician must apply moist warm heat and along with massage of the gland. Sialogogues are useful to promote production of saliva and to flush the stone out of the duct. In case of sialoliths associated with sialadenitis, a penicillinase resistant anti - staphylococcal antibiotic will be preferable. Most stones will respond to such a regimen, combined with simple sialolithotomy when required.[1]

Conclusion
It may be possible that obstruction caused by large calculi is sometimes asymptomatic as obstruction is not complete and some saliva manages to seep through or around the calculus.[2] Long term obstruction in the absence of infection can lead to atrophy of the gland with resultant lack of secretory function and ultimately fibrosis. Complete obstruction causes constant pain and swelling, pus may be seen draining from the duct and signs of systemic infection may be present.

References
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