Case Report

International Journal of Dental and Health Sciences
Volume 04, Issue 02

INTRAORAL REMOVAL OF SALIVARY STONE FROM THE PROXIMAL DUCT: A CASE REPORT

Sujeesh Koshy[1], Eapen Thomas[2], Ravi Rajan Areekkal [3], Akhilesh Prathap[4]

1.Senior Lecturer, Department of Oral And Maxillofacial Surgery, Pushpagiri College of Dental Sciences
2.Professor and Head of The Department Department of Oral And Maxillofacial Surgery, Pushpagiri College of Dental Sciences
3.Post Graduate Student Department of Oral And Maxillofacial Surgery, Pushpagiri College Of Dental Sciences
4.Reader, Department of Oral And Maxillofacial Surgery, Pushpagiri College of Dental Sciences

ABSTRACT:

Sialolithiasis is the most common cause of salivary gland disease and about 80% to 90% of stones occur in the submandibular gland. The majority of sialoliths occur in the submandibular gland or its duct and are a common cause of acute and chronic infections. Sialoliths are hard structures of oval shape with different size. The color varies from white to brown and has a nodular surface. Sialoliths are usually composed of an intensely calcified organic core and is surrounded by an alternative layer of organic and inorganic substance. Size varies from 10-15 mm. We present a case of 57-year-old female who reported to us with the complaint of pain and swelling, on the left side floor of the mouth. Based on the radiographic (sialography) and clinical examination a diagnosis of sialolithiasis of the left submandibular duct was made. The sialolith was removed under general anesthesia.

Keywords: Saliva, Sialolith, Wharton's Duct, submandibular gland (SMG)

INTRODUCTION

Sialolithiasis is characterized by the development of salivary stones, known as salivary calculi or sialoliths in the salivary duct or in the salivary gland. More than 80% of salivary sialoliths occur in the submandibular gland, 6-15% in the parotid gland and around 2% occur in sublingual and minor salivary gland.[1,2] Among them, 40% of the SMG stones are located in the distal submandibular duct near the punctum, and they are removed through the intraoral approach. The other 60% of the SMG stones are located in the proximal submandibular duct or in the submandibular gland, and they usually are removed by transcervical SMG resection. Frequency of occurrence is 1.2%, with male predominance.[3] Approximately 80% of sialoliths are reported to be less than 10 mm in size, and a review of the literature has shown the occurrence of abnormally large sialoliths (more than 15 mm) to be rare. [1, 2]

Salivary calculi develop due to deposition of mineral salts around a nidus of bacteria, desquamated cells or mucus. Sialoliths are composed of organic and inorganic substances. The organic layer is composed of condensed mucus, mucopolysaccharides, glycoproteins, cellular elements and lipids while the inorganic material is composed of calcium phosphate, calcium carbonate, and trace elements. The etiology of sialolith is assumed to be related to the specific

*Corresponding Author Address: Dr. Sujeesh Koshy Email: koshysujeesh@gmail.com

physiological and anatomic factors of the affected gland. The incidence of sialolithiasis in the sublingual gland is very rare and in some studies absent. 80 to 90% of sialoliths develop in the submandibular gland due to viscous consistency of saliva, high pH, high calcium concentration and mucin content. Moreover, Wharton's duct has an antigravity flow, long irregular course and a small opening that facilitates stasis of saliva. The chemical composition consists of microcrystalline apatite or whitlockite.[4,5] Submandibular stones are made up of 82% of inorganic and 18% of organic material, whereas parotid stones are formed of 49% inorganic and 51% organic material.[6] We report a case of a salivary duct stone of unusual size in a 57-year-old male patient and discuss its surgical management.

CASE DETAIL:

A 57-year-old female reported with a chief complaint of swelling, and pain on the left side floor of the mouth since 2 months. The patient's medical history was noncontributory. Pain was continuous and sharp in nature, pricking in type, radiating to the tongue with restricted tongue movement. Extraoral examination was insignificant. Intraoral examination revealed tenderness along the left Wharton's duct. Occlusal radiograph revealed no significant findings in the duct region. To rule out obstructions sialographic images were taken. The images showed an obstruction in the proximal duct with a radioopacity measuring about 4mm. (**Figure 1**)

On the basis of clinical and radiographic examination, diagnosis of sialolithiasis was made. Analgesics and antibiotics were given preoperatively, after which surgical removal of the sialolith from intraoral approach was planned.

Under general anesthesia sialolithotomy was performed from intraoral approach. Before placing the incision a knot was placed behind the expected position of the stone on the duct. This helped to prevent the slipping of the calculus further posterior during manipulation. (**Figure 2**) Sialolith was exposed by placing an incision on the floor of the mouth and dissecting the duct to a desired length proximally and distally (**Figure 3**). Followed by which the duct was palpated for the presence of hard prominence. Next an incision was placed on the prominence and the calculus was removed. A 4 mm diameter round, rough, hard, yellowish colored mass was obtained **(Figure 4).** The duct was sutured passively followed by the floor of the mouth using absorbable suture (**Figure 5**). Patient was discharged on the third postoperative day and was on the follow-up for 6 months. She showed no signs or symptoms of xerostomia, and salivary flow was normal.

DISCUSSION:

Sialoliths commonly measure around 5-10 mm in size and are mainly made up of calcium phosphate with small amounts of carbonates in the form of hydroxyapatite.[7] Typical presentation of sialolithiasis is pain and swelling of the involved salivary gland caused by

obstruction of salivary flow.[8] The pain and swelling usually occur during meals. Because sialoliths are usually symptomatic, patients often receive medical attention long before a sialolith becomes large. A growing sialolith increases obstruction of salivary secretion, which leads to various complications, such as swelling, pain, and secondary infection of the gland, and finally to the need for surgical intervention. [2]

A nidus, salivary stagnation and precipitation of salivary salts are necessary for the formation of sialolith. Infection, inflammation of the gland, physical trauma to the duct or orifice or presence of desquamated epithelial cells are involved in the development of salivary stones.[9] According to Ledesma Montes et al.[10] salivary proteins might also play an important role in sialolith formation Marchal et al.,[11] observed the presence of a sphincter system in the first 3 cm of the Wharton's duct in 90% of their studied cases, and suggested that variation of such a sphincter-like mechanism in the salivary duct could be a reason for easier retrograde migration of oral materials. In our case, the sialolith was located in the submandibular gland that is most susceptible to calculus formation due to a greater concentration of calcium and phosphate, alkalinity of its saliva with higher mucus content. Moreover, it has a tortuous course, causing tendency for secretory congestion and calculus formation.[9] Radiopacity is not a consistent feature in most of the submandibular stones; hence sialography or other imaging techniques (computed tomography scan, ultrasound) may be required for locating them.[12] Larger sialoliths appear as radiopaque masses and are easily seen on radiographs.[9]

The location, size, and configuration of the sialolith are important factors when planning intervention for a giant sialolith.[6] The goal of treatment for a giant sialolith, as well as for a standard-size sialolith, is restoration of normal salivary secretion. Although chronic sialadenitis secondary to persistent obstruction from a sialolith leads to a fibrotic and poorly functioning gland, symptoms apparently resolve after sialolith removal.[7]

Sialoliths should be removed by the least invasive procedure available to avoid risk of complications. Sialolithotomy is a well-reported technique for the transoral removal of a ductal sialolith, including giant sialoliths, without duct stenosis and lingual nerve damage.[13,17] However, as for the transoral removal of a proximal sialolith, it has been reported that there is increased risk of lingual nerve damage.6 According to Rai and Burman[7] a large sialolith should be removed by transoral sialolithotomy. Longterm obstruction by large sialoliths may cause salivary gland sialadenitis gland.[14] However, our patient after 6 months of sialolithotomy, showed no signs or symptoms of xerostomia with normal salivary flow. According to Soares et al. [15] intraductal stones can be removed by transoral approach, and an extraoral submandibular gland excision is indicated for intraglandular stones. Treatment of sialolith of a remarkable size

is challenging for the clinician. Conservative methods of treatment such as endoscopy, shockwave lithotripsy techniques should be considered as a substitute to surgical excision, especially for small calculi.[16]

The clinicians should carefully evaluate the swelling in the submandibular area due to sialolith that is most common in the submandibular gland and Wharton's duct. Larger submandibular sialolith should be treated by an appropriate approach to prevent complications.

CONCLUSION:

REFERENCES:

1. Lustmann J, Regev E, Melamed Y. Sialolithiasis. A survey on 245 patients and a review of the literature. Int J Oral Maxillofac Surg 1990;19:135-8.
2. Ashby RA. The chemistry of sialoliths: Stones and their homes. In: Norman JE, McGurk M, editors. Color Atlas and Text of the Salivary Glands: Diseases, Disorders, and Surgery. London, England: Mosby Wolfe; 1995.
3. Anneroth G, Eneroth CM, Isacsson G. Crystalline structure of salivary calculi. A microradiographic and microdiffractometric study. J Oral Pathol 1975;4:266-72.
4. Zenk J, Benzel W, Iro H. New modalities in the management of human sialolithiasis. Minim Invasive Ther 1994;3:275.
5. Rai M, Burman R. Giant submandibular sialolith of remarkable size in the comma area of Wharton's duct: A case report. J Oral Maxillofac Surg 2009;67:1329-32.
6. Carr SJ. Sialolith of unusual size and configuration. Report of a case. Oral Surg Oral Med Oral Pathol 1965;20:709-12.
7. Bodner L. Giant salivary gland calculi: Diagnostic imaging and surgical management. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2002;94:320-3.
8. Ledesma-Montes C, Garcés-Ortíz M, Salcido-García JF, Hernández-Flores F, Hernández-Guerrero JC. Giant sialolith: Case report and review of the literature. J Oral Maxillofac Surg 2007;65:128-30.
9. Marchal F, Kurt AM, Dulguerov P, Lehmann W. Retrograde theory in sialolithiasis formation. Arch Otolaryngol Head Neck Surg 2001;127:66-8.
10. Cawson RA, Odell EW. Neoplastic and non-neoplastic diseases of the salivary glands. In: Essentials of oral Pathology and Oral Medicine. Edinburgh: Churchill Livingstone; 1998. p. 239-40.
11. Graziani F, Vano M, Cei S, Tartaro G, Mario G. Unusual asymptomatic giant sialolith of the submandibular gland: A clinical report. J Craniofac Surg 2006;17:549-52.
12. Soares EC, Costa FW, Pessoa RM, Bezerra TP. Giant salivary calculus of the submandibular gland. Otolaryngol Head Neck Surg 2009;140:128-9.
13. Boffano P, Gallesio C. Surgical treatment of a giant sialolith of the Wharton duct. J Craniofac Surg 2010;21:134-5.
14. MuGurk M, Makdissi J, Brown JE. Intra-oral removal of stones from the hilum of the submandibular gland: report of technique and morbility. Int J Oral Maxillofac Surg. 2004; 33:683-686.
15. Teymoortash A, Tiemann M, Schrader C, Werner JA. Characterization of lymphoid infiltrates in chronic

obstructive sialadenitis associated with sialolithiasis. J Oral Pathol Med. 2004; 33:300-304.

FIGURES:

Fig 1 : sialographic image of salivary calculus

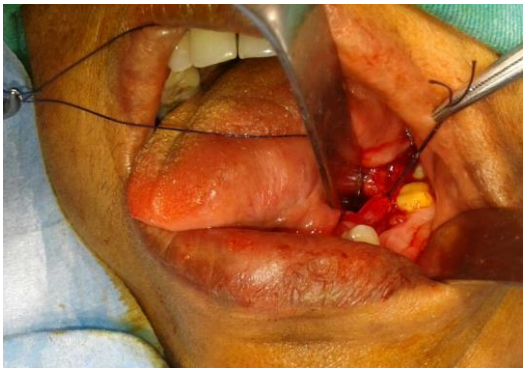

FIG 2 : Knot being tied on the distal duct

Fig 3 : dissection of the distal proximal duct

Fig 4 : removed salivary stone

Fig 5 : sutured surgical site