ARC Journal of Radiology and Medical Imaging
Volume 4, Issue 1, 2019, PP 6-9
www.arcjournals.org

Sialolithiasis: The Stones within the Oral Cavity – Two Case Reports and Review of Literature

Geon Pauly[1*], Roopashri Rajesh Kashyap[2], Raghavendra Kini[3], Prasanna Kumar Rao[4], Gowri P Bhandarkar[2], Meghana HC[5]

[1]Postgraduate Student, Department of Oral Medicine and Radiology, A J Institute of Dental Sciences, Kuntikana, Mangaluru, Karnataka, India

[2]Reader, Department of Oral Medicine and Radiology, A J Institute of Dental Sciences, Kuntikana, Mangaluru, Karnataka, India

[3]Professor and Head, Department of Oral Medicine and Radiology, A J Institute of Dental Sciences, Kuntikana, Mangaluru, Karnataka, India

[4]Professor, Department of Oral Medicine and Radiology, A J Institute of Dental Sciences, Kuntikana, Mangaluru, Karnataka, India

[5]Associate Professor, Department of Oral Medicine and Radiology, A J Institute of Dental Sciences, Kuntikana, Mangaluru, Karnataka, India

Corresponding Author:** ***Geon Pauly, *Postgraduate Student, Department of Oral Medicine and Radiology, A J Institute of Dental Sciences, Kuntikana, Mangaluru, Karnataka, India,* ***Email:*** *geonpauly@gmail.com*

Abstract: *Sialolithiasis is derived from the Greek words sialon (saliva) and lithos (stone), and the Latin -iasis meaning "process" or "morbid condition". It is often observed in the oral cavity, and is caused by the development of a calculus in the salivary gland or duct. It mainly occurs in the third to sixth decade of life and seldom develops in children. The clinical presentation typically consists of a painful swelling of the \involved salivary gland at meal times, as the obstruction is most acute at this time. The clinical signs often lead to an easy diagnosis.*

Keywords: *Submandibular Gland, Wharton's Duct, Sialolith, Salivary Calculi.*

1. Introduction

Sialolithiasis or salivary gland duct calculus or salivary stones are the most common pathologies of the salivary gland. Sialoliths are deposits obstructing the ducts of major or minor salivary glands or its parenchyma. Sialolithiasis accounts for more than 50% of diseases of the major salivary glands and is the most common cause of acute and chronic infections [1]. Most of the stones are sized less than 10 mm and only 7% of them are larger than 15 millimetres; those are considered giant salivary gland stones [2]. Hereby, we present two cases of submandibular sialoliths with varying presentation and size.

2. Case Report

2.1. Case 1

A 65-year-old male patient came with a complaint of pain and swelling on the left side of the face since 15 days. Pain was recurrent in nature. The patient's dental, medical and family histories were non-contributory.

There was no history of any increase of the swelling during meals. Extra-oral examination revealed a solitary, diffuse swelling below the angle of the mandible on the left side and was soft and tender on palpation [Figure 1-D].

Intra-oral examination revealed a diffuse, tubular swelling on the left lateral aspect of the lingual frenulum [Figure 1-A]. It was tender to palpation and there was pus discharge on milking the Wharton's duct on the concerned side [Figure 1-C, D].

Occlusal radiographic examination revealed an ovoid shaped radiopacity on the left side just medial to the lower border of the mandible [Figure 1-E]. A diagnosis of submandibular sialolith was confirmed. Patient was posted to the department of surgery where it was surgically removed. After removal patient was recalled at an interval of 1, 3 and 6 months and no recurrence was *noted*.

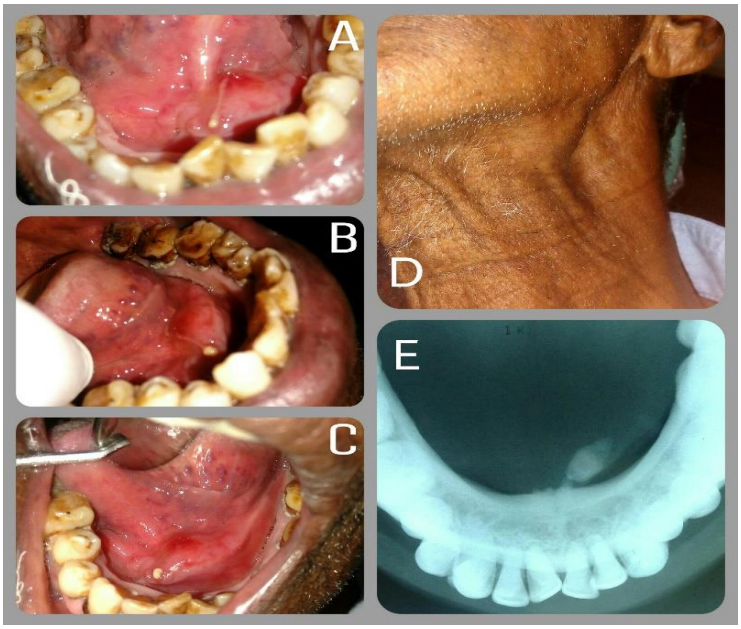

Figure1: *A, B, C - Swelling in the floor of the mouth with pus discharge. D – Extra-oral swelling on the left side of the face. E – Occlusal radiograph showing sialolith*

2.2. Case 2

A 58-year-old male patient came with a complaint of pain in the lower left back tooth region since 1 month. Pain was intermittent in nature. The patient's dental, medical and family histories were non-contributory. Intra-oral examination revealed a decay in relation to left mandibular first molar and was tender to percussion. An incidental finding revealed a diffuse, nodular swelling on the right lateral aspect adjacent to the lingual frenulum [Figure 2-A, B].

There was slight tenderness on palpation and patient later gave a history of occasional discomfort while having food. An occlusal radiograph revealed spherical radiopacity on the right side just medical to the lower border of the mandible which confirmed the diagnosis as submandibular sialolith [Figure 2-D, E]. Patient was posted to the department of surgery where it was surgically removed. After removal patient was recalled at an interval of 1, 3 and 6 months and no recurrence was noted.

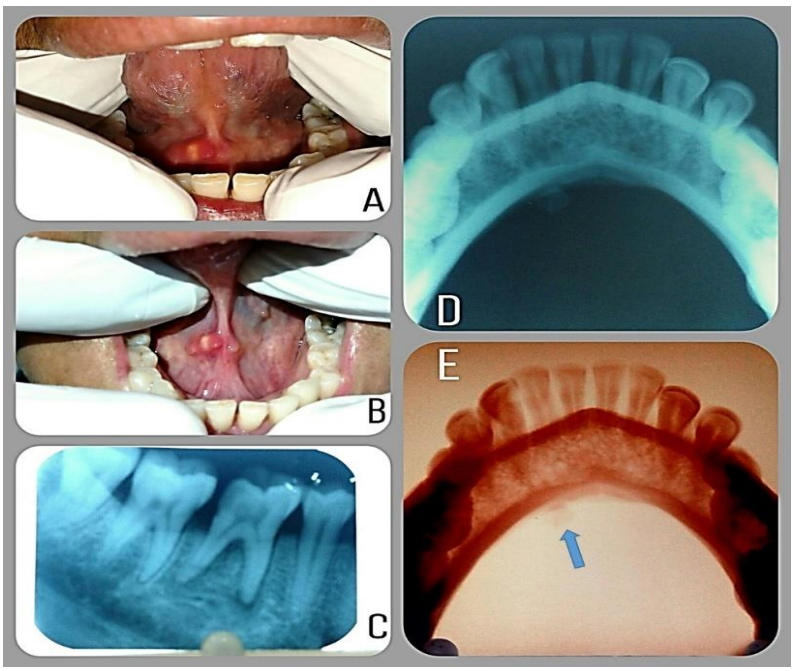

Figure2: *A, B - Swelling in the floor of the mouth along lingual frenulum. C – IOPA showing peri-apical abscess i.r.t. 36.D– Sialolith seen on occlusal radiograph. E - Occlusal radiograph with adjusted contrast showing sialolith*

3. DISCUSSION

Salivary gland calculi are a common occurrence in the salivary glands. However, the majority of the sialoliths occur in the submandibular gland or its duct and can cause chronic infection. Usually, males are affected twice as much as females. More than 60% in the submandibular gland or its duct, 6% in the parotid gland and 2% in the sublingual gland [3].

The striking difference between parotid and submandibular stones can mainly be related to the following factors: [3, 4]

- Ascending and sharp angled duct system of the submandibular gland
- Mucous type of secretion
- Tortuous course of Wharton's duct
- Higher calcium and phosphate levels
- The dependent position of the submandibular gland, which leave them more prone to stasis

Some sialoliths may be asymptomatic and identified incidentally during jaw imaging or clinically during intra-oral examination like in our second case. But mostly they are characterized by a series of symptoms. Approximately 30% of the time, sialolithiasis presents with painless swelling. But the classic symptoms are secondary to duct obstruction and include pain and swelling of the involved gland during eating when saliva production is at its maximum and salivary flow is forced against a fixed obstruction. In some cases, the swelling is accompanied by an episode of salivary colic: an acute, lacerating pain that disappears after 15 or 20 minute. Subsequent gradual reduction of the swelling can occur, but as salivary flow is stimulated, painful symptoms can recur. Patients may have episodic swelling and discomfort, or may have more persistent symptoms as salivary fluid accumulates within the duct [5].

The exact aetiology 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 mucin, bacteria and desquamated epithelial cells. According to literature, formation of a sialolith occurs in two phases: [5, 6]

- Central core
- Layered periphery

The central core is formed by 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 body, whereas submandibular stones are thought to form around a nidus of mucous [6].

Another theory has proposed that an unknown metabolic phenomenon can increase the salivary bicarbonate content, which alters the calcium phosphate solubility and leads to precipitation of calcium and phosphate ions. A retrograde theory proposed suggested that, bacteria or any substance within the oral cavity might migrate into the salivary ducts and become the nidus for further calcifications [6, 7].

The co-existence of sialoliths and malignancies has also been recently reported, with multiple myeloma and lymphoma having been found in association with a parotid gland sialolith [8]. A case of sialolithiasis found in association with an adenoid cystic carcinoma of the submandibular gland has been recently reported [9]. Differential diagnoses include neoplastic processes of the salivary gland, such as pleomorphic adenoma, the commonest salivary gland neoplasm, which presents clinically with similar characteristics as sialolithiasis, a firm, painless, slow-growing mass. Other lesions include mucus cyst, irritation fibroma and mucocele, which may present with similar characteristics to sialolithiasis of the minor salivary gland [8].

Imaging modalities, both conventional and advanced are very useful in diagnosing sialolithiasis. Plain film radiography of the major salivary glands is advised in order to visualize possible radiopaque sialoliths. Sialoliths obstructing the submandibular gland can be visualized by panoramic, occlusal, or lateral oblique views. A standard occlusal film can be placed intraorally adjacent to the parotid duct to visualize a stone close to the gland orifice. Ultrasonography is best at differentiating between intra and extra-glandular masses, as well as between cystic and solid lesions. Calcified structures are better visualized by CT. This modality is especially useful for the evaluation of inflammatory conditions that are associated with sialoliths [10].

Treatment objective of the salivary stones, as for the standard stones, is to restore function of the affected salivary gland. Conventional treatment depends on the location of the sialolith and can be intra- or extra-oral. They can be enlisted under as: [11]

- Non-invasive
- Minimally invasive
- Surgical

Some current treatment options are:

For small stones, hydration, moist heat therapy, nonsteroidal anti-inflammatory drugs occasionally, and having the patient take any food or beverage that is bitter or sour. Sucking on citrus fruits, such as a lemon or orange, may increase salivation and promote spontaneous expulsion of the stone. Some stones may be massaged or milked out [12].

Minimally invasive treatment procedures range from a single probing extraction, extraction with sialographic control using the sialoendoscope, LASER intraductal lithotripsy and lithotripsy extracorporeal shock wave (ESWL) [13].

However, majority of the cases require surgical excision of the sialolith, such as sialectomy where in the duct is cannulated and the stone is removed. Surgical excision of the gland may be necessary for large and deeply located sialoliths [14].

4. Conclusion

A salivary stone or calculi can be asymptomatic or constantly painful as seen in our cases. Saliva can manage to seep through and around the calculi not disrupting normal functions. However, long term obstruction in the absence of infection can lead to either atrophy of the gland with resultant lack of secretory function or even ultimate fibrosis. Cases of complete obstruction can result in chronic pain, swelling and even pus discharge indicating an underlying infection as seen in our case. Thus, a timely diagnosis and appropriate treatment is elementary.

References

[1] Kayalvizhi EB, John Baliah, Vishwanath Rangdhol, Lakshman VL. Giant Sialolithiasis - A Case Report and Review. Journal of Scientific Dentistry 2014; 4(2): 30-33.

[2] Oliveira ER, Coradette CDS, Marson GBO, Hasse PN. Giant sialolith of submandibular gland: case report. RSBO. 2016; 13(1): 55-9.

[3] S. Jaya Chandra. Submandibular Sialoithiasis Analysis of 4 Case Reports. JIMSA. 2010; 23(2): 97-8.

[4] Sathish, Chandrashekar, Ganesan S.Journal of Dental Sciences and Research. 2011; 1(1): 16-22.

[5] Soumithran, Mathew M, Arul De, Mithilesh, Fazmiya. IOSR Journal of Dental and Medical Sciences. 2016; 15(7): 96-100.

[6] Tanushri, Sangmesh, Gupta P, Panat SR. Submandibular gland sialolithiasis – A case report. Journal of dental sciences and oral rehabilitation. 2011; 1: 44-5.

[7] Marchul F. Kurt A M, Dulguerov P,Lehmann W. Retrograde Theory insialolithiasis formation. Archives of Otolaryngology- Head and Neck Surgery 2001; 127: 66-8.

[8] Souza IF,Kawatake MM, Soares AB, Moraes PDC, Araújo VCD, Passador-Santos F. Sialolithiasis of minor salivary glands. Rev GaúchOdontol. 2015; 1: 63-8.

[9] Okada H, Yokokawa M, Komiya M, Akimoto Y, Kaneda T,Yamamoto H. A rare case of sialolithiasis of the lower lipsimulating a mucocele and review of the literature. QuintessenceInt. 2011; 42(7): 589-94.

[10] Martin S. Greenberg, Burket's oral medicine, 11th edi. 2008; 8: 191-223.

[11] Teshome A. Submandibular Sialolithiasis. J Dent Oral Health. 2015; 1(5): 1-3.

[12] Capaccio, P; Torretta, S; Ottavian, F; Sambataro, G; Pignataro, L. Modern management of obstructive salivary diseases. ActaOtorhinolaryngologicaItalica. 2007; (4): 161–72.

[13] Pastor-Ramos V, Cuervo-Díaz A, Aracil-Kessler L. Sialolithiasis. Proposal for a new minimally invasive procedure: Piezoelectric surgery. J ClinExp Dent. 2014; 6(3): 295–8.

[14] Angiero F, Benedicenti S, Romanos GE, Crippa R. Clinical and histopathological findings of sialoliths. Brazilian Journal of Oral Sciences. 2005; 15(4): 899-903.

Citation: *Geon Pauly, Roopashri Rajesh Kashyap, Raghavendra Kini, Prasanna Kumar Rao, Gowri P Bhandarkar, Meghana HC. Sialolithiasis: The Stones within the Oral Cavity – Two Case Reports and Review of Literature. ARC Journal of Radiology and al Imaging. 2019; 4(1): 6-9.*