



International Journal of Applied Dental Sciences

ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2018; 4(3): 18-21
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www.oraljournal.com
Received: 05-05-2018
Accepted: 06-06-2018

Dr. Sobitha G
Senior Resident, Government
Dental College, Kottayam,
Kerala, India

Dr. Muhammad Ali T
Senior Resident, Government
Dental College, Kottayam,
Kerala, India

Dr. Jayalakshmi Jayakumar
Junior Resident, Government
Dental College, Kottayam,
Kerala, India

Dr. Remya G
Junior Resident, Government
Dental College, Kottayam,
Kerala, India

Correspondence
Dr. Sobitha G
Senior Resident, Government
Dental College, Kottayam,
Kerala, India

Transoral sialolithotomy for submandibular sialolithiasis: A case series

**Dr. Sobitha G, Dr. Muhammad Ali T, Dr. Jayalakshmi Jayakumar and
Dr. Remya G**

Abstract

Sialolithiasis accounts to be the most common disease effecting the salivary glands. Highest incidence is in the submandibular gland and ductal system. Management of sialolithiasis range from conservative and minimally invasive procedures to gland excision. Transoral sialolithotomy is a versatile procedure for the management of sialolith occurring in the distal portion of the ductal system. In this article we present two cases of transoral sialolithotomy of submandibular duct done under local anesthesia along with an overview of aetiopathogenesis, clinical presentation, diagnostic aids and various treatment modalities.

Keywords: Submandibular gland, sialolith, Trans oral sialolithotomy, sialography

1. Introduction

Sialolithiasis is a common disease responsible for the swelling of major salivary glands and accounts for 30 % of salivary disorders. It commonly occurs in the submandibular gland about 92%, followed by parotid 6% and the sublingual and minor salivary glands 2% each [1]. Male predilection over females in 2:1 ratio [2]. Sialolith is composed of a different mixture of calcium phosphate and carbonates in the form of hydroxyapatite and various amount of potassium, magnesium and ammonia in an organic matrix. The organic matrix consist of glycoproteins, mucopolysaccharides and cellular debris. Submandibular stones are 82% inorganic and 18% organic material whereas parotid stones are composed of 49% inorganic and 51% organic material [3]. The formation of sialolith can be due to retention of saliva due to duct stenosis or duct diverticuli or it can be due to variation in salivary composition due high supersaturation, crystallization, inhibitor deficit etc [4]. Sialolith is common in submandibular duct due to its tortuosity, length and antigravity flow. Various hypothesis are proposed which explains the occurrence of sialolithiasis. The first is based on the existence of intracellular microcalculi, when exerted in the canal acts as a nidus for calculi [5]. The second hypothesis states bacteria or any other substances in the oral cavity can migrate into the duct and act as a nidus [6].

Growth rate of salivary stones is considered to be 1 mm per year [7]. They can be round or irregular in shape and size varies from 2 mm to 3.2 mm for parotid and 2 mm to 4.9 mm for submandibular gland [8]. The etiologic agent for sialolithiasis remains unknown. Various studies were conducted to identify the relationship of sialolithiasis with, water hardness, hypercalcemia and tobacco smoking, but none proved to have a positive correlation [9, 10, 11]. Radiological diagnostic approaches include, conventional radiography, ultrasonography, computed tomography, sialography, MR sialography and sialoendoscopy. The treatment options ranges from trans oral sialolithotomy, laser assisted sialolithotomy, extracorporeal and intracorporeal shock wave lithotripsy, sialoendoscopy and basket retrieval, salivary gland excision etc.

Case 1

A 27 year old female reported to our department with complaint of a swelling in the floor of mouth and pain while eating of 3 months duration. She also had decreased salivation. On examination a 1 x 1.5 cm swelling was present in the left side floor of mouth in relation to 35, 36 region. Mucosa overlying the swelling was slightly inflamed with tenderness on palpation.

Occlusal radiograph revealed the presence of sialolith which was removed by transoral sialolithotomy along with a course of antibiotics and anti-inflammatory agents.



Fig 1: Intra Oral View



Fig 2: Occlusal X-Ray



Fig 3: Incision and Exposure



Fig 4: After Silolithotomy



Fig 5: Sialolith Removed

Case 2

A 54 year old male patient reported to the department with pain and intermittent swelling in the right side floor of mouth since 2 months. There was no obvious swelling at the time of presentation, on bimanual palpation he had tenderness in the right submandibular region. History of swelling at the time of meals suggested sialolithiasis which was proved with occlusal radiograph. Transoral sialolithotomy was done under local anesthesia. Post operative antibiotics and analgesics was given.



Fig 6: Occlusal X-Ray



Fig 7: Sialolith Removal

Case 3

A 46 year old female patient reported to the department with pain and swelling in the left side of floor of mouth since 2 months. On examination a 1cm X 0.5 cm swelling was present on the left side floor of mouth which was bimanually palpable and firm in consistency and tender on palpation. An occlusal x-ray revealed the presence of sialolith. Trans oral sialolithotomy was done in local anesthesia under coverage of antibiotics and analgesics.



Fig 8: Intraoral View



Fig 9: Occlusal X-Ray

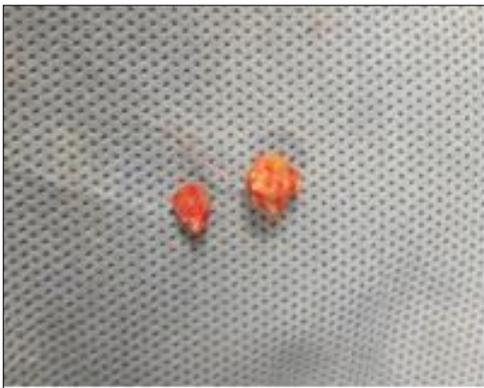


Fig 10: Sialolith Removal

2. Discussion

A review of aetiopathogenesis of sialolith suggest that intermittent stasis produce a change in the mucoid element of saliva resulting in the formation of a gel, which acts as a frame work for the deposition of salts and organic substances [12]. Main theories of sialolithiasis are traditional theory consist of two phases: a central core and layered periphery [13]. Central core is mostly of inorganic nature, surrounded by a layered deposition of organic and inorganic materials in the periphery. Metabolic theory suggest that an alteration in the sodium bicarbonate content that alters the calcium solubility causing calcium precipitation [14]. Retrograde theory tells about bacteria and organic substances from oral cavity entering the duct to act as a nidus [13]. Sub mandibular stones are supposed to have a mucus nidus, where as parotid stones are thought to arise from a inflammatory cells or foreign body [15].

Predisposing factors for sialolithiasis is quite unknown. Gout is the only systemic disease predisposing to sialolithiasis forming uric acid stones [16], and a positive association with

nephrolithiasis was found in a study [17]. Careful history, clinical examination and radiological evaluation is necessary for diagnosis. Bimanual palpation of submandibular gland and palpation around the orifice of stensons duct for parotid. Uniformly firm and hard glands on palpation are considered non functional. Deeper parotid stones are often unpalpable. Stone of minor salivary glands is rare and presents as firm nodule in the buccal mucosa or upper lip [18]. Most of the patients presents with pain and swelling that usually occurs on stimulation of salivary flow. Pus from the ductal orifice and signs of systemic infection suggest sialadenitis. In such cases culture sensitivity and appropriate antibiotic therapy is advised before surgical intervention.

Acute sialadenitis of salivary gland commonly occurs due to obstruction of duct caused by sialolithiasis [13]. Sialolith can be either radiolucent or radioopaque. Radioopaque stones can be easily identified by occlusal radiograph. Obstructions due to radiolucent stones can be identified by sialography and ultrasonography. However sialography is contraindicated in acute infection and contrast allergy [13]. Patients usually present with a firm, tender swelling in the glandular region which exacerbates on eating, hence called as meal time syndrome. Sialolithiasis can lead to acute and chronic sialadenitis, sialoangiectasis, retention of saliva and mucocele formation, complete obstruction of duct and atrophy of gland. The management of sialolithiasis depends upon the the number, size, and site of the stone in the duct or gland and age of the patient. Conservative management for small sialoliths include, proper hydration, moist warm heat application, gland massage, sialogogues, antibiotics, antiinflammatory agents etc. Smaller sialolith near the ductal opening can be removed by manipulation called milking the gland. Larger sialoliths are surgically removed. Unimpacted stones may be removed by intubation of duct by fine soft plastic catheter and application of suction to the tube. Trans oral sialolithotomy is ideal for stones located in the distal one third of submandibular duct. Lacrimal probes and dilators can be used to open up the duct and locate the stone positioned more posteriorly in the submandibular duct. Sialoendoscopy and basket retrieval is a minimally invasive procedure and an excellent diagnostic aid using miniature endoscopes. Extrcorporeal piezoelectric shock wave lithotripsy can be used to fragment the stones, and these fragments are removed by stimulation of salivary flow by sialogogues. Endoscopic intrcorporeal shock wave lithotripsy is also gaining popularity. Lithotripsy produces stone fragments of about 0.7 mm in size and the ductal diameter is greater than this except at the ostium [19]. Lithotripsy avoids the complications like facial nerve paralysis, frey's syndrome and surgical scar associated with gland removal [20]. Multiple stones in the gland needs surgical removal of the gland. Submandibular gland removal and parotidectomy is the treatment of choice for intraglandular stones and recurrent pain and infection.

In both our cases transoral sialolithotomy was done to remove the submandibular duct stones under local anesthesia. The location of stone was confirmed by occlusal radiographs. After giving LA, a suture was placed behind the stone to avoid the posterior dislodgment of sialolith on manipulation. An incision was placed in the mucosa parallel to the duct to avoid injury to lingual nerve and the sublingual gland. Blunt dissection of tissues was done to locate the duct, and part of duct lodging the stone was identified. A longitudinal incision is made over the stone, and was removed using small arter forceps. A cannula was passed into the duct to aspirate the pieces of stone and mucin and the duct was probed to ensure

the patency anterior to the surgical area. All the sialolith measured around 1 cmx 0.5 cm in dimension. In all the cases the duct were not sutured and the overlying mucosa was closed with vicryl. The patients were kept on post operative antibiotics and antinflammatory agents for five days. Post operative period was without any complications. Trans oral sialolithotomy is an ideal option for sialolith located in submandibular duct in a palpable position.

3. Conclusion

Sialolithiasis is a most common cause of sialadenitis. Poper history, clinical and radiologic evaluation is important for diagnosis. From the various treatment options the choice of treatment for a particulay case depends upon the site, size of sialolith and patient preferences. Initially managed conservatively and using minimally invasive techniques. Stones larger than 12 mm, in which success rate of lithotripsy is less than 20% neccissitates surgical gland removal^[3].

4. Acknowledgments: Nil

5. References

1. El Deeb M, Holte N, Gorlin RJ. Submandibular salivary gland sialoliths perforated through the oral floor. *Oral Surg Oral Med Oral Pathol.* 1981; 51:134-9.
2. Cawson RA, Odell EW. *Essentials of oral pathology and oral medicine* 6th ed. Edinburgh: Churchill Livingstone, 1998, 239-240.
3. Zenk J, Benzel W, Iro H. New modalities in the management of human sialolithiasis. Minimally invasive therapy. 1994; 3:275-284.
4. Grases F, Santiago C, Simonet BM, Costa-Bauza A. Sialolithiasis: mechanism of calculi formation and etiologic factors. *Clin Chim Acta.* 2003; 334:131-6.
5. Harrison JD, Epivatianos A, Bhatia SN. Role of microliths in the etiology of submandibular sialadenitis: a clinicopathological investigation of 154 cases. *Histopathology.* 1997; 31:237-251.
6. Marchal F, Kurt AM, Dulguerov P, Lehmann W. Retrograde theory in sialolithiasis formation. *Arch Otolaryngol Head Neck Surg.* 2001; 127:66-68.
7. Rauch S, Gorlin RJ. Disease of the salivary glands. In: Gorlin RJ, Goldmann HM, eds. *Thomas' Oral Pathology.* St Louis, Mo: CV Mosby. 1970:997-1003.
8. Marchal F, Dulguerov P, Becker M, Barki G, Disant F, Lehmann W. Submandibular diagnostic and interventional sialendoscopy: new procedure for ductal disorders. *Ann Otol Rhinol Laryngol.* 2002; 111:27-35.
9. Sheman JA, Mc Gurk M. Lack of correlation between water hardness and salivary calculi in England. *Br J Oral Maxillofac Surg.* 2000; 38:50-53.
10. Epivatianos A, Harrison JD, Garrett JR, Davies KJ, Senkus R. Ultrastructural and histochemical observations on intracellular and luminal microcalculi in the feline sublingual salivary gland. *J Oral Pathol.* 1986; 15:513-517.
11. Nagler RM, Klein I, Zarzhevsky N, Drigues N, Reznick AZ. Characterization of the differentiated antioxidant profile of human saliva. *Free Radic Biol Med.* 2002; 32:268-277.
12. Williams MF. Sialolithiasis. *Otolaryngologic clinics of North America.* 1999; 32:819-834.
13. Marchal F, Kurt AM, Dulguerov P, Lehmann W. Retrograde theory in sialolithiasis formation. *Arch Otolaryngol Head Neck Surg.* 2001; 127:66-8.
14. Blatt I. Studies in sialolithiasis: III. Pathogenesis, diagnosis, and treatment. *South Med J.* 1964; 57:723-728.
15. Rice DH. Advances in diagnosis and management of salivary gland diseases. *West J Med.* 1984; 140: 238-249.
16. Work WP, Hecht DW. Inflammatory diseases of the major salivary glands. In Papperalla MM, Shumrick DF (eds): *Otolaryngology Philadelphia,* W B Saunders. 1980; 3:2235-2243.
17. Lustmann J, Regev E, Melamed Sialolithiasis Y. A survey on 245 patients and a review of the literature. *Int J Oral Maxillofac Surg.* 1990; 19:135-138.
18. Ho V, Currie WJR, Walker A. Sialolithiasis of minor salivary glands. *Br J Oral Maxillofac Surg.* 1992; 30:273-275.
19. Zenk J, Werner G, Hosemann MD, Iro H. Diameters of the main excretory ducts of the adult human submandibular and parotid gland – a histological study. *Oral Surg, Oral Med, Oral Pathol, Oral Radiol, Endod.* 1998; 85:576-580.
20. Iro H, Schneider HTh, Fodra C. Shockwave lithotripsy of salivary duct stones. *Lancet.* 1992; 339:1333-1336.