Surgical Management of an Anterior Submandibular Gland Sialolithiasis

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ABSTRACT

Sialolithiasis is considered as one of the most common disorders of the salivary glands. A history of pain or swelling in the salivary glands, especially during meal, suggests this diagnosis. For small and accessible stones, conservative therapies like milking of ducts with palliative therapy can produce satisfactory results. Surgical management should be considered when the stone/stones are inaccessible or large in size, as conservative therapies turned out to be unsatisfactory. The aim of this paper is to describe one more case to the literature and review the theories of etiology, clinical features, available diagnostic, and treatment procedures.

KEYWORDS: Submandibular gland, Sialolithiasis, calculus, Surgical Management

INTRODUCTION

Sialolithiasis consists on the formation of calcific concretions within the parenchyma or ductal system of the major or minor salivary glands. However, it commonly affects the submandibular salivary gland. Sialolithiasis usually occurs in adults aged 30 to 60 years and causes pathognomonic pain during meals. The treatment of sialolithiasis depends on the size and location of the calculi. In this paper we present one case of large (>8mm) sialoliths of the submandibular gland, treated with transoral sialolithotomy and a review of existing literature, emphasizing on the theories of etiology, usual and unusual locations, clinical features, diagnostic and treatment modalities, along with their indications and contraindications.

CASE REPORT

A 58 years old female patient reported to the Department of Oral Surgery in the Consultation Center of Dental Treatment of Rabat, complaining from discomfort in the left floor of the mouth. No relevant medical history was reported. The lesion was gradually increased in size, with no history of bleeding and no pain. The Intra-oral examination revealed a sessile firm well defined growth mass located in the mandibular left anterior region of the floor of the mouth, measuring approximately 1.5 x 1 cm in diameter and 2.5cm in length. The lesion was extended to the premolar and submandibular region (Figure 1). The occlusal incidence revealed a dense radiopaque mass in the left mandibular anterior region corresponding to the left submandibular gland duct location. (Figure 2) Based on the clinical and radiological data, the positive diagnosis was in favor of submandibular gland lithiasis.

How to cite this article:
https://doi.org/10.38110/ijohmr.2020.v07i01.002

Figure 1: Introral-Oral Examination revealing a sessile firm well defined mass located in the mandibular left anterior region

Figure 2: Occlusal incidence revealed a dense radiopaque mass in the left Submandibular anterior region
Treatment of choice was an excisional biopsy. Under local anaesthesia, the removal of the lesion was performed and the calculus was taken out to the surface after having extracting it (Figure 3 and 4).

The patient was followed-up during a period of one month and showed a complete healing with no sign of recurrence.

Sialolithiasis is considered to be the most common salivary gland disorder, and it accounts for about 1.2% of unilateral major salivary gland swellings. Submandibular gland has the highest predilection for sialolithiasis with 80% occurrence rate, followed by the parotid (19%) and the sublingual (1%) glands. Sialolithiasis is usually seen between the age of 30 and 60 years. It is uncommon in children, as only 3% of all sialolithiasis cases have been reported in the pediatric population. Males are affected twice more than females. The clinical symptoms include swelling and pain in the affected gland. If the blockage of the duct is complete, the symptoms will be severe. Pain and swelling, may be recurrent and most pronounced during meals.3,4

The exact aetiology and pathogenesis of salivary calculi are still unknown. Several hypothetical etiologies were described in the literature ranging from anatomical variations of the salivary ducts, agglomeration of sialomicroliths to an altered biochemical composition of saliva.

Most common sites related to sialoliths are the buccal mucosa followed by the upper lip. Some authors have reported the upper lip, buccal mucosa, lower lip as the most affected sites.5,6,7 It is important to mention that sialoliths have been associated particularly to sites where trauma has been caused by the dentition, such as the lips and the buccal mucosa, which may indicate a possible etiological factor.6,7 However, no history of trauma prior to the development of the lesions was observed in the previous studies.

Clinically, lesions of sialolithiasis are rounded, oval or cylindrical, mobile or firm nodules which is in accordance with our clinical findings.5,8,9

The sialolith is a calcified mass with laminated layers of inorganic material. It results from the crystallization of salivary solute. It is yellowish-white in color, single multiple, may be rounded, ovoid or elongated having the size of 2cm or above or more in diameter. The minerals are various forms of calcium phosphate like hydroxyapatite octacalcium phosphate etc. calcium and phosphorous ions are deposited on the organic nidus, which may be, desquamated epithelial cell, bacteria, foreign particles or products of bacterial deposition. It is said that the sialoliths grow at the rate of 1mm per year, and may be formed in the parenchyma or the duct of the major or minor salivary gland. Obstructive sialadenitis with or without sialolithiasis represents the main inflammatory disorder of the major salivary glands. Approximately 80% of sialolithiasis involves the submandibular glands, 20% occurs in the parotid gland, and less than 1% is found in the sublingual gland. Patients typically present with painful swelling of the gland at meal times when obstruction caused by the calculus becomes most acute.

DISCUSSION

Sialolithiasis is a common salivary gland disorder defined by the presence of a calculus within the salivary gland or its excretory system, leading to an obstructive phenomenon.1,2 Bilateral involvement is rare but remains possible and predominates in the submandibular gland.

Figure 3 (a+b): Intra-Oral Excision of the calculus

Figure 4: The excised Sialolith
The treatment consists on the removal of the sialolith, since a long term obstruction of the salivary gland duct can lead to inflammation and secondary infection.1,6,10

Medical treatment have been reported based on the prescription of sialogogues when the size of the sialith is small and when the its situation is anterior. Non-invasive conservative treatments as sialendoscopy and extracorporeal lithotripsy have shown remarkable results. The radical invasive treatment is reserved for the failed conservative treatment or depends on a posterior situation of the sialith.11,6,10 In general, recurrence is not a common finding.

Preservation of gland function in conjunction with low-level risk and discomfort for the patient should be the main objective in the treatment of sialolithiasis.12,13 The treatment of choice varies according to the size, location, and number of stones but also the situation of the stone near the lingual nerve. When stones are small, moist warm heat application with the administration of sialogogues and gland massage help in flushing the stone out of the duct. Small sialoliths can be removed through the duct orifice using bimanual palpation. The infection should be treated with antibiotics, and these cases should be combined with simple sialolithotomy when required.14,15

Sialoendoscopy, which is a minimally invasive technique, was first introduced by Katz10 in 1991 and has since been developed by Marchael et al. and Nahlieli et al. There have been many reports on Sialoendoscopic surgery for submandibular gland sialolithiasis which discussed the usage of sialoendoscopy for the removal of sialoliths. Klein and Ardekian mentioned that sialoliths up-to the range of 4-5mm of diameter are the ideal for sialoendoscopic removal while it is a challenge for the surgeons to perform sialoendoscopy of the sialoliths located deep within the hilum. There are speculations regarding the endoscopic approach since a general consensus is yet to arrive on either the maximum diameter of the stones that could be removed without fragmentation or whether impacted or hard stones could be managed effectively by endoscopy alone. The general indication for the approach is the combination of sialoendoscopy with extra-corporeal lithotripsy (Storz SL1 Minilith) using Thullium laser (Revolix) for the fragmentation of Lithiases between the range of 4 and 8mm. Interventional sialoendoscopy, particularly in procedures involving large stones or stenotic ducts, did fail even in the hands of experienced surgeons (about 20% failure rate).16,17,18

Upon failure of non-invasive techniques mainly due to the size of the stones and their location, the Sialoliths are treated by open surgical approaches. These include transoral duct incision, purely external approaches, or a combination of approaches. An Endoscopy assisted transoral removal technique for larger or impacted stones can also be of utility.19,20,21

Zenk et al. concluded in their study that transoral removal should be the treatment of choice in patients with submandibular stones that can be palpated bimanually and localized by ultrasound within the perihilar region of the gland.22,23

The excision of the submandibular gland for chronic sialadenitis is more frequent and is secondary to lithiasis. The CO₂ laser enables bloodless surgery and a clear vision of the operating site.24,25,26

CONCLUSION

Sialolithiasis is a common salivary gland disorder. It is easy to diagnose on the basis of its clinical features. Computed tomography remains the gold standard to assess the location, the volume and the number of existing salivary stones. The location of the sialolith, the patient cooperation as well as their medical and surgical history are decisive factors to define the treatment modalities.27,28

Non-invasive conservative treatments including sialoendoscopy and extracorporeal lithotripsy have been reported and highly recommended when indicated.29

REFERENCES


Date of Submission: 22/03/2020. Date of Publication: 12/11/2020