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Sialolithiasis and its management: A clinical study

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Abstract

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, which may form 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. When conservative management with sialogogues, massage, heat, fluids and antibiotics fails, then sialolithiasis needs to be surgically treated by transoral sialolithotomy, sialendoscopic and sialendoscopy assisted techniques; or as a last resort, excision of the affected gland. Hence; in the present study, we presented our experience of treating sialolithiasis.

Keywords: Sialolithiasis, management, inorganic material

Introduction

Sialoliths are calcified structures that develop within the ductal system of a major and minor salivary gland, it is both a cause and a consequence of chronic recurring sialadenitis, and it is frequently a cause of acute suppurative sialadenitis, the stone are commonly composed of organic calcium and sodium phosphate salts they are believed to arise from deposition of these salts around a nidus of debris within the duct lumen, the debris may include inspissated mucus, bacteria, ductal, epithelial cells or foreign bodies. Sialoliths commonly measure between 5 and 10 mm in size, and all stones over 10 mm can be reported as sialoliths of unusual size. Giant sialoliths measuring more than 35 mm are rare.

Patients with sialoliths most commonly present with a history of acute, painful and intermediate swelling of the affected major salivary gland, the degree of symptoms is dependent on the extent of salivary duct obstructions and the presence of secondary infection, typically eating will initiate the salivary gland swelling, the stones totally or partially blocks the flow of saliva, causing salivary pooling within the gland ductal system. Since the gland are encapsulated, there is little space for expansion and enlargement causes pain and discomfort, then the swelling subsides when salivary stimulation ceases and output decreases^[1, 2].

Salivary glands with obstructive sialoliths are frequently enlarged and tender, stasis of the saliva may lead to infection fibrosis and gland atrophy, fistulae, a sinus tract or ulceration may occur over the stone in chronic cases, an examination of the soft tissue surrounding the duct may show edema and inflammation, digital along the pathway of the duct may confirm the presence of the stone, suppurative or nonsuppurative retrograde bacterial infection can occur, particularly when the obstruction is chronic and other complications from sialoliths include acute sialadenitis, ductal stricture and ductal dilation.

These stones are very well identified with a help of radiographs, an occlusal radiograph is recommended for submandibular glands, stones in the parotid gland can be more difficult to visualize due to the superimposition of other anatomic structures, an AP view of the face is useful for visualization of the parotid stone, an occlusal film places as intra orally adjacent to the duct may also help, CT images may be used for the diagnosis of sialoliths calcified

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phlepholiths are some stones that lie within the blood vessels can therefore identified by sialograph. A small probe is attached to a specially designed endoscopic unit can explore primary and secondary ductal system [2, 3, 4, 5, 6].

A relative new technique for visualizing and subsequently removing sialoliths is sialoendoscopy; the endoscopic unit has a surgical tip that can obtain soft tissue biopsies and help to remove calcified materials using a minimally invasive technique under general anesthesia [7, 10].

During acute phase of therapy is primarily supportive standard care includes analgesics, hydration, antibiotics and antipyretics are necessary. The stones that are near the orifice of the duct can often be removed Trans orally by milking the gland and but deeper stones require removal with surgery under endoscopy.

Material and Methods

The present study included our experience with sialolithiasis of 20 patients with in the submandibular and parotid and sublingual gland (table 1). All the patients were treated in Oral and maxillofacial surgery department. No sex predilection was followed. All the cases were treated under local anesthesia except one case in which submandibular gland excision was done under general anesthesia initially attempted intraorally. As stone was located in the glandular’s parenchyma near posterior region of the Wharton’s duct and thus were treated by submandibular gland and sialolith excision using submandibular approach (fig 1 and 2)

Clinical examination was correlated with radiographic and CT findings. Age range of patients for the study was between 20 - 40. Xylocaine with 1: 80,000 adrenaline was infiltrated in the surgical site to achieve haemostasis, local anaesthesia inferior alveolar nerve block and infiltrations was administered intra orally. Skin and intra oral preparation were done with Betadene. The exact site of the stone is located by x-rays (fig 3 & 4& 5). and palpation, following this a suture may be placed behind the stones to prevent its backward movement, the tongue is lifted and held with the help of a gauze.

Incision is made in the mucosa parallel to the duct taking care not to injure the structures like lingual nerve and sub lingual glands (fig 6 & 7). after this, blunt dissection is carried out, the tissues are displaced to locate the duct, once part of the duct lodging the stone is identified, a longitudinal incision is made over the stone, the stone is removed using small forceps, in case stone is large it is crushed with a help of the forceps, following this a cannula (fig 8) may be passed to aspirate the pieces of stones, mucin etc. and to maintain the patency of the duct anterior to the surgical area. A 3.0 silk suture is placed at the level of the mucosa. After the procedure patient should be reviewed post operatively after 3 days, the following parameters should be checked. Tongue movement, speech, paraesthesia, wound healing and other signs of infection and salivary retention etc. After excision, the specimens were analyzed histopathologically to exclude presence of any neoplasm.

Result

End results in the study of 19 patients treated with Trans oral sialolithotomy were reviewed. None of the patients experienced secondary infections. No slurring of speech was recorded. Three patients had paresthesia of mental nerve. Wound healing was uneventful in all the cases. Tongue movement was good in all the cases. Post-operative radiographs were taken for all the patients. Since layered suturing was done, scar was non prominent and was not

visible. The results claim Trans oral sialolithotomy approach is a meticulous technique in surgical removal of the submandibular salivary stones, than the other various techniques. One patient treated with gland excision although transoral method was attempted first,

Gland name	Number of patients	Treatment method
Submandibular gland	17	Transoral sialolithotomy [16], 1 gland excision
Parotid gland	2	Transoral sialolithotomy
Sublingual gland	1	Transoral sialolithotomy



Fig 1: Showing procedural view



Fig 2: Showing intraoperative view



Fig 3: Showing CBCT of the sialolithiasis



Fig 4: Showing IOPA



Fig 5: Operative view



Fig 6: Another operative view



Fig 7: Suturing

Discussion

These sialoliths are calcified organic matter that forms with in the secretory system of the major and minor salivary glands, it is difficult to determine since many cases are asymptomatic and very painful, due to its severity in pain and swelling characteristics clinicians may tend to confuse with odontogenic infections and diseases and find difficult in diagnosing, and so various radiographs that includes AP views, occlusal radiographs, sialoendo scopes are done, its etiology and recurrence rates are well explained by grasas F, Santiago c, simonet BM, costa –beuza 13. if stone can be removed from the duct without damaging the body of the gland, nearly completesalivary cann occur8. Lithotripsy and sialoendoscopy can be helpful as non-invasive or minimally invasive treatments for sialolitha [11, 7]. Ultrasonography will detect stones and extracorporeal lithotripsy procedures may be needed, it has been reptorted that more effective for parotid versus submandibular calculi with a 68% success rate after 10 years 12. Reported complications from lithotripsy include transient hearing changes, hematoma, and pain Sialoendoscopyis anendoscopic technique useful for soft tissue biopsies, explorative procedures and removal of stones [4, 10].

Visualization helps the practitioner to establish a diagnosis and determine the least invasive treatment of choice, with few complications encountered4. In spite of the variety of techniques available to the treatment of sialolithiasis, the submandibular gland excision with the sialolith demonstrated to be a well-indicated and secure technique to treat sialadenitis due sialolithiasis, when the calculi is located in areas accessible by the intraoral approach and when the gland is not functional [14].

Conclusion

The Transoral sialolithotomy is a versatile technique for the surgical management of Sialolithiasis. Transoral sialolithotomy is a meticulous technique as it involves short duration of local anaesthesia, decreased possibility of facial nerve and lingual nerve damage. The scar is non visible. At the end of this study, Transoral sialolithotomy approach is found to be an excellent method for the surgical removal of salivary stones from major salivary glands.

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