International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

A Study on Chronic Submandibular Sialadenitis Secondary to Sialolithiasis

Raffee Arifa[1], Swaroop Dev[2], Bharath Kumar[3], Kashifullah Shaik[4]

[1]Postgraduate, Department of ENT, Sri Siddhartha Medical College& Research Centre, Tumkur, Sri Siddhartha Academy of Higher Education, Tumkur, Karnataka, India
Corresponding author Email: *arifaali0293[at]gmail.com*

[2]Professor, Department of ENT, Sri Siddhartha Medical College& Research Centre, Tumkur, Sri Siddhartha Academy of Higher Education, Tumkur, Karnataka, India

[3]Assistant professor, Department of ENT, Sri Siddhartha Medical College& Research Centre, Tumkur, Sri Siddhartha Academy of Higher Education, Tumkur, Karnataka, India

[4]Postgraduate, Department of ENT, Sri Siddhartha Medical College& Research Centre, Tumkur, Sri Siddhartha Academy of Higher Education, Tumkur, Karnataka, India

Abstract: ***Sialolithiasis is one of the most common disorders of the salivary glands. A history of pain or/and swelling in the salivary glands, especially during meal suggests this diagnosis. The conservative therapies with palliative therapy can produce satisfactory results for small and accessible stones. When the stone/stones are inaccessible or large in size surgical management should be considered. In this paper, we present ten cases of sialolithiasis in different sites of the submandibular gland and the wharton'duct. The purpose of this paper is to add ten more cases to the literature and review the theories of etiology, clinical features, diagnostic and treatment procedures.***

Keywords: Sialolithiasis, Submandibular gland, Sialoadenectomy

1. Introduction

The submandibular gland (a major salivary gland) is a mixed, predominantly mucous gland with a large superficial lobe and small deep lobe that connect around the posterior border of the mylohyoid muscle at the angle of the jaw. [1]Chronic obstructive submandibular sialadenitis is a common clinical disease which can cause salivary hypofunction. Sialolithiasis is the most common cause of inflammatory disease of the submandibular gland. [2] Sialolithiasis is a condition characterized by the obstruction of salivary gland or its excretory duct by a calculus or sialolith associated with: swelling, pain, and infection of affected gland, resulting in salivary ectasia and even provoking the subsequent dilatation of the salivary gland. Sialolithiasis accounts for 30% of salivary diseases and it most commonly involves the submandibular gland (80% to 95%) and less frequently the parotid (5% to 20%) The submandibular gland is more susceptible to the development of the salivary calculi than parotid gland because:

- The Warton's duct is longer and thinner than the Stenson's duct.
- The salivary flow is against gravity in the submandibular gland.
- The salivary submandibular pH is more alkaline and mucin proteins, calcium and phosphates are contained in greater amount than serous parotid saliva. [3]

Carbonate and phosphate forms of calcium, remains of desquamated epithelia of salivary gland, mucopolysaccharides and glycoprotein like organic components constitute a sialolith. The dimension of the stone varies from 1 mm, majorly less than 10 mm and very few cases have noted giant calculi with the diameter exceeding 15 mm. A careful palpation of the oral floor allows the detection of the exact position of a stone and the diagnosis can be confirmed through ultrasonography (USG), conventional radiography, computed tomography (CT), and/or cone beam computed tomography. [4]The management of the following cases involves surgical excision with no postoperative complications.

Aim

To evaluate and report the cases of chronic submandibular gland sialadenitis secondary to sialolithiasis with its surgical management.

Objective

To evaluate and report the cases of chronic submandibular gland sialadenitis secondary to sialolithiasis and its surgical management.

2. Materials and Methods

The present study was reported at the Sri Siddhartha Medical College and hospital, tumkur, Karnataka between December 2020 and December 2022. A total of 10 patients were admitted in the ENT department with an ailment of swelling, pain and inflammation on one side restricted to the lower jaw region. Written consent for publication of their cases and images has been obtained from the respective patients.

Inclusion Criteria:

All patients aged between 30 and 55 years attending ENT OPD, SSMC, TUMKUR, KARNATAKA with complaints of pain or /and swelling in the submandibular region

diagnosed to have submandibular sialolithiasis were included in the study.

Exclusion Criteria:

1) Uncontrolled diabetic mellitus, hypertension, heart disease.
2) Salivary gland tumours.
3) Oral submucosal fibrosis and other conditions where trismus present.

A male patient of age 42 years presented to the ENT OPD with the complaints of swelling and pain in left submandibular region since one year on and off. Diffuse swelling over the left submandibular region was observed. The overlying skin was normal and area was tender on palpation. The left submandibular gland was tender on bimanual palpation. The oral mucosa was normal in texture, with mild erythema in orifice of left wharton's duct. Pus discharge from the orifice of left Wharton's duct was observed on performing milking manoeuver. Sialolith was present in the junction of anterior 1/3 rd and post 2/3rd of wharton's duct. CT image showed calcified structure in the left wharton's duct that confirmed the primary diagnosis of sialolithiasis. Medications given to relieve pain and called two weeks later for the surgery and left submadibulectomy with removal of stone done under general anaesthesia.

Figure 1: Identified left submandibular Sialdenitis

Figure 2: Left submandibular gland Sialdenitis with sialolith

Intraoperative findings:

Figure 3: Incision given and tissues dissected in layers

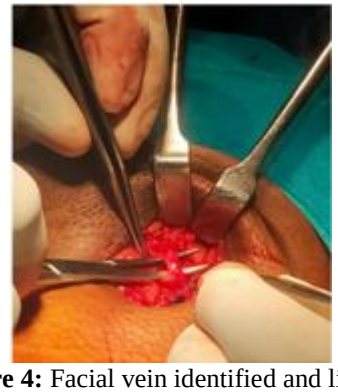

Figure 4: Facial vein identified and ligated

Figure 5: Submanibular gland identified

Figure 6: Sialolith Identified

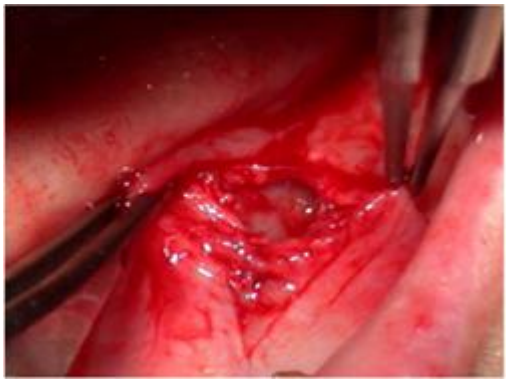

Figure 7: Sialolith Removed

Other cases presented with the similar complaints of fever, pain and swelling in the submandibular region on and off. History of increase of size of swelling noticed after chewing food. Palpable mass was mobile, soft and presents sensation of a nut below the tongue. CT scan demonstrated radiopaque lesion reinforcing the diagnosis as sialolithiasis. Patient was given a course of antibiotics to reduce the infection and called two weeks later and surgical excision of gland done with removal of stone under general anaesthesia.

Surgical Treatment:
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 trans - oral removal technique for larger or impacted stones can also be of utility.

We selected to surgically remove sialolith along with the gland under general anaesthesia. Submandibular gland excision (sialoadenectomy) were performed by an incision through the dermal layers, between two locations; exactly 2 cm beneath the mandibular lower border and above the gland. Sialoadenectomy was performed around the muscle and the branch of the facial nerve. The stone in the duct/gland removed and incision was closed layer by layer. All thepatients underwent the same extra - oral surgical technique; affected side submandibular gland was removed along with the calculus and had uneventful healing without any postoperative complications.

3. Results

Of the 10 patients included in the study 6 were male (60%) and 4 (40%) were female. Theage of the patient ranged between 30 years to 55 years with almost even incidence in the 3rd to 5thdecade (30%, 40%, 30%). The exaggeration of symptoms is related to meals. The Distribution between the right (60%) and left sites (40%) respectively. The sialoliths4 (50%) were located in the anterior portion of Wharton's duct, 1 at junction of ant 1/3rd and post 2/3rd, 1 (10%) in the posterior portion, and 4 (40%) within the gland itself. All patients were available for follow up and there was no recurrence.

	Case#1	Case#2	Case#3	Case#4	Case#5	Case#6	Case#7	Case#8	Case#9	Case#10
Sex	M	M	F	M	F	F	M	F	M	M
Age	42 years	47 years	42 years	35 years	38 years	48 years	32 years	53years	52 years	55years
Gland involved	SUBMANDIBULAR GLAND									
Side involved	Left	Right	Right	Left	Right	Right	Left	Right	Left	Right
Location of sialolith	Junction of ant1/3rd&post 2/3rd	Within Gland	Ant Portion of duct	Within gland	Ant Portion of duct	Within gland	Ant Portion of duct	Within gland	Ant Portion Of duct	Post portion Of duct
Size of sialolith	1.5x0.5 Cm	1.5x1Cm	5x7Mm	1.3x2cm	8x5 mm	1x2 Cm	7.5x6 Mm	1.7x0.8 Cm	8x3 mm	5x6 Mm
Wt. in grams	0.06	0.08	0.01	0.2	0.05	0.1	0.08	0.3	0.05	0.04

4. Discussion

The M: F ratio is 3: 2 in this study. The almost equal distribution between right and left sites and no bilateral involvement seen in the present study. Sialolithiasis is a pathology manifested by impediment of ductal system by sialoliths (calculi). [5]The growing dimensions of calculi enhance the blockage of saliva release, causing infections and swollen glands. Complete obliteration causes painful enlargement. Prolonged impediment of the ductal system of the salivary glands causes consequential bereavement from saliva. The secretions of submandibular gland lead to increased levels of hydroxyapatite as well as phosphates enhanced viscosity, more mucous and escalated basicity. Therefore, it has more chances to develop calculus than all other salivary glands. This further leads to proclivity toward salt precipitation around the duct opening. The Wharton's duct is thin and traverses upward for its opening and this anatomy tends to produce more hindrance in the saliva emancipation. Two stages of sialolith formation can be found in the literature: i) central core formation and ii) layered periphery formation. Firstly, mineral salts bound by certain organic substances precipitate to form the central core. Then, in the second phase, some organic and inorganic materials deposit around the central core in layers. Parotid and submandibular stones are thought to frequently form around a nidus of inflammatory cells or foreign body and a nidus of mucous respectively. Boynton and Lieblich in 2014 reported an unusual case in which a facial hair of the patient got entrapped in the Wharton's duct and acted as a nidus for the formation of a sialolith. Another theory has proposed that an unknown metabolic phenomenon can lead to precipitation of salivary calcium and phosphate ions by increasing the salivary bicarbonate content, which in turn alters the calcium phosphate solubility. [6]The chief complaint of the patient includes discomforting pain, swelling, during or after having foodwhich reduce within 2 or 3 hours and most importantly curtailed saliva formation.

The cases mentioned in this study have recurrent swelling, pus discharge and pain in the gland. Subjects also have a fibrosis, oedematous gland and palpable mass of sialolith. Complications of sialolithiasis include presence of

secondary infections, abscess formation, stenosed saliva ducts, mucocele development, chronic sclerosing sialadenitis (Kuttner'stumor) and chronic atrophic parenchymal layer of the gland have to be taken care if present.

Investigations helping in the diagnosis include radiographs, radiological sialography, USG, CT, MRI and endoscopy of the salivary glands. Katz *et al*. and various other authors have reported that ultrasonography is a very useful diagnostic tool for submandibular sialolithiasis with a sensitivity and specificity between 90% and 95% respectively. [7]

Though costly, tomographic investigation is the most meticulous non - surgical method for detecting the position, size of even the tiniest stones and the number of clustered sialoliths. After the successful removal of the submandibular gland and calculus, close followup is needed. Submandibularglandectomy, sometimes, has a side effect on nerve (marginal mandibular) causing palsy (permanent or short - lived), though none of the subjects suffered from this condition.

5. Conclusion

The present article highlights the first line of management of sialolithiasis as adenectomy. The finding of the present study suggests that any gland having fibrotic changes, infectiously swelled, painful, pus releasing, loss of function with a sialolith should undergo sialoadenectomy.

Acknowledgement: Nil

Financial Support and Sponsorship: Nil

Conflicts of Interest: Nil

References

[1] Arifa SP, Christopher PJ, Kumar S, Kengasubbiah S, Shenoy V. Sialolithiasis of the Submandibular Gland: Report of Cases. Cureus.2019 Mar 6; 11 (3): e4180.
[2] Li J, Xu XY, Lu ZW, Guan QB, Chen JF. Sialendoscopy - assisted intraoral incision approach for the treatment of posterior Wharton's duct stones: our experience and outcomes. WideochirInne TechMaloinwazyjne.2021; 16 (1): 249 - 255.
[3] 3. Oteri G, Procopio RM, Cicciù M. Giant Salivary Gland Calculi (GSGC): Report Of Two Cases. The Open Dentistry Journal.2011; 5: 90 - 95.
[4] 4. Abdulkareem, Elham Hazeim et al. Gold standard approach for removing sialoliths from the submandibular gland (2018).
[5] 5. Levy DM, Remine WH, Devine KD. Salivary gland calculi. Pain, swelling associated with eating. JAMA.1962; 181: 1115–1119.
[6] 6. Pachisia S, Mandal G, Sahu S, Ghosh S. Submandibular sialolithiasis: A series of three case reports with review of literature. Clin Pract.2019; 9 (1): 1119
[7] 7. Katz P, Hartl DM, Guerre A. Clinical ultrasound of the salivary glands. Otolaryngol Clin North Am 2009; 42: 973 - 1000.