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SUBMANDIBULAR SALIVARY GLAND SIALOLITHIASIS MANAGEMENT :A CASE REPORT

1. Mehak Malhotra
2. Jasmine Kaur
3. Amit Dhawan
4. Tejinder Kaur

1. Post graduate student, Department of Oral and Maxillofacial Surgery Sri Guru Ram Das Institute of Dental Sciences and Research, Amritsar.
2. M.D.S, Assoc. Professor, Department of Oral and Maxillofacial Surgery, Sri Guru Ram Das Institute of Dental Sciences and Research, Amritsar.
3. M.D.S, Assoc. Professor, Department of Oral and Maxillofacial Surgery, Sri Guru Ram Das Institute of Dental Sciences and Research, Amritsar.
4. M.D.S, Professor & H.O.D, Department of Oral and Maxillofacial Surgery, Sri Guru Ram Das Institute of Dental Sciences and Research, Amritsar.

Corresponding author:
Name: Dr. Jasmine Kaur
Assoc. Professor, Department of Oral and Maxillofacial Surgery
Sri Guru Ram Das Institute of Dental Sciences and Research, Amritsar.

ABSTRACT:Sialolithiasis is a common disease of salivary glands. The submandibular gland is affected by a number of disease processes that may be difficult to distinguish clinically. Its superficial location makes it ideal for ultrasound evaluation and a useful adjunct to clinical examination.There is a slight male predominance. More than 80% of salivary calculi occur in the submandibular gland or its duct.This occurrence along with more deep and proximally placed common calculi in submandibular gland may occasionally cause a dilemma in selection of the appropriate surgical approach in the present era of sialoendoscopic surgery. Excision of the submandibular gland with the stone in such a situation should still be preferred as the goldstandard of treatment.The accepted method for submandibular gland excision traditionally includes ligation of the facial artery . Preservation of the Facial Artery may be significant in reconstructive procedures of the head and neck and its ligation may altogether be obviated

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INTRODUCTION

Sialolithiasis is the most common disease of the salivary glands in middle-aged patients. It is estimated that sialolithiasis affects 12 of every 1000 patients in the adult population.[1] More than 80% of the salivary gland calculi appear in the submandibular gland, but they can also be located in the glandular parenchyma and more frequently in the excretory duct.[2] More than 80–95 % of the salivary gland calculi appear in the submandibular gland, parotid gland 5–20 % and 1–2 % in sublingual and minor salivary glands.[3] The submandibular gland is most frequently involved because of its anatomic location, long and tortuous duct with a narrow orifice compared to the main portion of duct.[4]Traditional and recent etiopathogenetic factors include a reduced salivary flow rate, a change in pH, dehydration, duct anomalies, and the retrograde migration of foods bacteria or foreign bodies from the oral cavity favoring stone formation.[5]

CASE REPORT

A 48-year-old male reported to the Department of Oral and Maxillofacial Surgery at Sri Guru Ram Das Institute Of Dental Sciences and Research with a history of intermittent, dull, aching pain and swelling in his right submandibular area since the past 1 month. The patient also gave a history of similar episode around 10 years back which resolved with

Figure 1 Ultrasound of submandibular gland

Figure 2 Orthopantomogram of the patient depicting sialolith

Figure 3 Skin Marking done during the surgical procedure

Figure 4

Figure 5 Sparing of Facial artery done

Figure 6 Excised Submandibular gland along with 3 sialolith

medication. On extraoral examination, there was a localized swelling in the right submandibular region measuring approximately 3.5cm × 2cm .The swelling was tender with no color change in the overlying mucosa .On bimanual milking of the gland ,frank pus was expressed from ductal opening.General clinical history revealed that the patient was in good health; no other signs, symptoms, or abnormalities were found.

Orthopantomogram and right lateral oblique view of mandible were advised.The radiographs revealed two well defined radio opacities in the involved region ,suggestive of sialoliths.Ultrasonography of right submandibular gland revealed an enlarged submandibular gland measuring 39×23mm with presence of two hyperechoic foci and echopoor collection measuring 2.8×1cm in size deep to right submandibular gland. A definitive diagnosis of submandibular gland sialolithiasis with acute sialadenitis was made. Patient was prescribed antibiotics Injection Cefotaxime Sodium (Taxim) 1g I/V twice a day , Injection Amikacin Sulphate (Mikacin) 500mg I/V twice a day , Tablet Metronidazole(Metrogyl) 400mg three times a day, Tablet Limcee 500mg once a day along with good fluid intake for acute sialadenitis .After the acute phase subsided , the patient was posted for surgical intervention

The right submandibular gland removal was done under general anaesthesia .A 7 cm long incision was placed 3cm below the inferior border of mandible along the natural skin crease in order to avoid damage to the mandibular branch of the facial nerve.The skin flap was raised . The subcutaneous fat was stripped with firm pressure with a swab from the underlying muscle for approximately 1 cm on each side of the incision. The underlying platysma was then incised to the full extent of the skin incision. The underlying investing layer of the deep cervical fascia was next divided, with scissors, after the fascia was tented outwards with toothed forceps. Subplatysmal flap was elevated superiorly and inferiorly and the marginal mandibular nerve was identified and gently retracted with the upper part of the flap. The delicate capsule overlying the gland was then lifted with toothed dissection forceps and opened with scissors . The loose connective tissue was separated with scissors to expose the surface of the gland.The left submental vein was identified at the superior border of submandibular gland and submental artery was deep to the gland.The vascular branches to the gland were meticulously dissected and clamped. The anterior belly of the digastric muscle and the mylohyoid muscle were detached. The facial vein and facial artery were preserved. The dissection continued to mobilize the posterior pole of the superficial lobe of the gland which is then gently retracted posteriorly. The posterior border of the mylohyoid lies within the groove of superficial and deep lobes. It was gently freed with scissors and then retracted forward with a Langenbeck retractor. The submandibular salivary gland was then now be pulled downwards revealing the V-shaped lingual nerve which was retracted carefully. The submandibular duct was clamped, divided and ligated as anterior as possible with just enough remaining to drain the

sublingual gland .The gland was liberated from the submandibular ganglion thus freeing the lingual nerve & was then removed.

DISCUSSION

The salivary calculi develop as a result of deposition of mineral salts around a nidus of bacteria, mucus, or desquamated cells. The sialoliths are mainly made up of calcium and phosphate with smaller quantities of ammonia, potassium and magnesium. The parotid stones generally comprise of 49 % inorganic material and 51 % organic material whereas, the submandibular stones consist of 82 % inorganic and 18 % organic material[6]

The aetiologic factors implied in the sialolith formation can be classified in two large groups: a) saliva retention due to morphoanatomic factors (salivary duct stenosis, salivary duct diverticuli, etc.) and b) saliva composition factors (high supersaturation, crystallisation inhibitors deficit, etc.)[7]

The predisposing factors in calculus formation are salivary stagnation, increased alkalinity of saliva, infection or inflammation of the salivary duct or gland, and physical trauma to the salivary duct or gland. It results in swelling, pain and recurrent infections of the associated gland by causing the obstruction of salivary flow. Stones are believed to be more common in submandibular duct system and the reasons cited for that are: (1) the submandibular excretory duct is wider in diameter and longer (2) the salivary flow in the submandibular gland is against gravity (3) the submandibular salivary secretion is more alkaline compared with pH of parotid saliva (4) the submandibular saliva contains a higher quantity of mucin proteins.[8]

Investigations like sialography, occlusal radiographs, orthopantomogram, ultrasonogram, CT scan and MRI Neck have been advocated. In our case, an ultrasound, orthopantogram and a lateral oblique view of calculi in the gland was done to accurately confirm the length and total dimension of the calculus .

According to Tepan[9] complete obstruction of the duct causes constant pain and swelling with associated pus draining from the duct. On palpation a tender ,firm to hard submandibular gland indicates a longstanding infection of the gland[10].Our patient also reported with pain in the right submandibular area which was aggravated by eating or in response to other salivary stimuli. Further,due to long standing obstruction, fibrosis of the gland was present.The swelling was hard and firm when palpated extraorally and on bimanual milking, frank pus was expressed indicating an acute infection.

Treatment options for sialolithiasis are

1) Intraoral sialolithotomy (traditional approach),

2) For large sialoliths that are located in the close proximal duct managed by extracorporeal shock wave lithotripsy (ESWL) (ultrasound to break the stone),

3) Endoscopy intracorporeal shock wave lithotripsy (EISWL) is also gaining importance because of less damage to the adjacent tissues during the procedure,

4) Sialendoscopy, which is a non-invasive technique, can be used to manage large sialoliths and duct obliteration,

5) The extra oral approach might required some times mainly when dealing with a large stone

6) A large sialolithesp in the gland requires excision of the gland.[10]

Patients presenting with sialolithiasis may benefit from trial of a conservative approach. Various published reports [11] of minimally invasive techniques makes the time tested excision of salivary gland in glandular calculi unpopular. However, authors believe that surgical excision of the gland with the calculi is still the gold standard of treatment for intraglandular calculi with associated non-functional gland. In our case, we decided to do a total excision of the gland with removal of calculi as the calculi was intraglandular. Although the arterial supply of the face is abundant, gland was excised following the preservation of facial vessels.The preservation of the Facial vessels does not significantly prolong the procedure or leads to complications, the time honored principle of 'do no harm' should be adhered to.[12]

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