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Case Report

Surgical Management of Parotid Sialolith

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ABSTRACT

Sialolith are calcareous deposits in the ducts of major or minor salivary glands or within the gland themselves. They are thought to form from a slowly calcifying nidus of tissue or bacterial nidus. Sialolithiasis accounts for 30% of salivary gland disease and commonly involves the submandibular gland (83-94%)and less frequently the parotid(4-10%) and sublingual gland(1-7%).This case report presents a rare case of parotid gland calculi which was managed surgically.

Key words: Parotid gland, sialolith, sialolithiasis.

INTRODUCTION

Salivary gland calculi or sialolith is a common disease of salivary gland, usually found in the submandibular gland and the ducts. [1] Males are effected twice as much as female.[2] Children are rarely effected but review of literature reveals 1000 cases of submandibular calculi in children aged three weeks to fifteen years of old.[3] Salivary calculi are usually unilateral, multiple calculi are rare. [4]The exact cause of sialolithiasis remains unclear; some sialolith may be related to dehydration which increases the viscosity of the saliva, reduced food intake which decreases the demand for saliva. Certain medications that lower the production of saliva such as antihistamines, antihypertensives and antidepressants. [5]Sialolith are composed of varying ratios of organic and inorganic substance. The organic substance is glycoproteins, mucopolysaccharides and cellular debris. The inorganic substances are mainly calcium carbonates and phosphates. Calcium, magnesium and phosphate ions each comprise between 20 and 25% with other minerals making up the remainder. Sialolith reach a critical size or position to cause a partial or complete obstruction of duct. This result in sialadenitis which manifest as a painful swelling of the gland that is most pronounced before, during and immediately after meals. Calculi may cause stasis of saliva leading to bacterial ascent into the parenchyma of the gland and therefore infection, pain and swelling. [6] Long time obstruction in absence of infection can lead to atrophy of gland with

resultant lack of secretary function and ultimately fibrosis. [6] For parotid stones careful intraoral palpation around stenson's duct orifice may reveal a stone, but deeper parotid stones are not palpable. Diagnosis is usually made by characteristic history and physical examination. Diagnosis can be confirmed by radiographs, sialogram, ultrasound, computed tomography etc. Computed tomography which is limited by the fact that the stone can be occulted by thick radiological slices and scan, do not provide the precise localisation of sialolith within the duct system. [7] Sialography is useful in patients showing signs of sialadenitis, but contraindicated in acute infection or in significant patient contrast allergy. Ultrasonography currently represents an excellent first level diagnostic technique reveals ductal and highly mineralised stones with diameter of at least 1.5 mm with accuracy of 99%. [7] The first aim of treatment is to relieve pain and infection. The further treatment depends on position and size of calculi.

CASE REPORT

A 56 Year old patient reported to us complaining of recurrent pain and swelling of parotid region since three months. He also complained of occasional salty taste in the mouth. Patient had consulted a doctor before and taken antibiotics for the same without relief. Extraorally, a mildly tender and diffuse swelling was evident in the parotid region. There was no rise in temperature or decrease in mouth opening. Intraorally, a swelling a diffuse swelling of left buccal region which was fibrous to touch and not adhered to any deeper structures was found. No calculi or foreign body was palpable. However, on massaging the swelling, pus was seen coming out of parotid duct opening. No palpable neck nodes were seen. Facial nerve integrity was maintained. Ultrasonography was done to confirm the diagnosis which revealed the presence of parotid gland calculi (Fig.1).

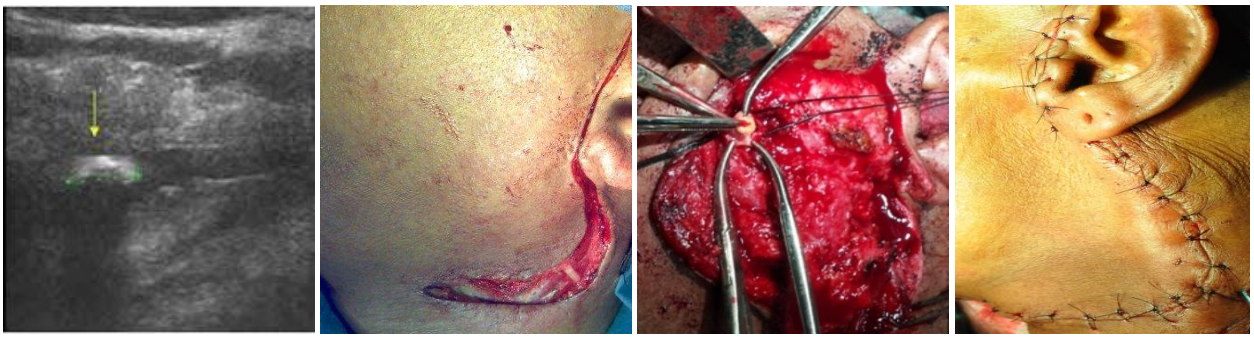

Figure Legends:
Figure 1: Ultrasonography image showing calculi in parotid gland
Figure 2: The pre-auricular incision
Figure 3: Surgical exploration of Calculi
Figure 4: Wound closure

Patient was planned for exploration in view of incomplete response to antibiotics and recurrence. Since the stone was not palpable intraorally, extraoral approach was planned through classical incision for parotidectomy under general anaesthesia. Under general anaesthesia with nasoendotracheal intubation surgery was performed under routine aseptic precaution. Hypotensive anaesthesia was used as this considerably reduces oozing and thus makes it easier to trace facial nerve. The incision

line was infiltrated with lignocaine hydrochloride and 1:80,000 adrenaline and incision made with knife. Pre auricular incision was placed extending downwards to continue to a suitable skin crease in the neck (Fig.2). The skin flap is raised in the plane of pre parotid fascia and held forward by suturing the margins of the flap to adjacent towels. Skin flaps was elevated upto angle of mouth. Parotid gland was noted to be edematous and firm with features of parotitis. The duct was identified at the site where it pierces the buccinators and traced proximally to the gland parenchyma. No stone was noticed along this area and hence the duct was traced into the gland, the stone was noted at the site where the duct entered the gland parenchyma (Fig.3).This area was explored and incision was made over the duct to identify the stone which was removed. In view of chronic parotitis and possibility of post-operative leak, the duct was ligated. Parotidectomy was not attempted because of chronic parotitis which could make parotidectomy difficult with possible adhesions and injury to facial nerve. Wound was drained and skin closed in layers (Fig.4). The patient received antibiotics and analgesics. Post operatively patient had mild discomfort which settled. Patient was discharged on the fifth day and was advised to continue antibiotics for three more days. There was no salivary leak at the time of discharge. After four weeks there was no pus discharge and the surgical site healed satisfactorily.

DISCUSSION

Unreasonable salivary gland/duct swelling at meal times is pathognomonic clinical symptom of sialolithiasis. This symptom is usually short lived, not exceeding more than two hours. In some patient the swelling is accompanied by pain and patient presents with episodes of salivary colic, an acute lacerating pain which does not last for long and disappears after 15-20 minutes. [8] Clinical symptoms are vital for diagnosis of this condition; it is possible that the calculi may be undetected despite being present. Swelling of gland varies in size from time to time. Infection of gland may occur causing redness and pain. This may develop into abscess. Sometimes it may be asymptomatic until stone passes forward and can be palpated in the duct or seen at duct orifice. It may be possible that obstruction caused by large calculi is sometimes asymptomatic as obstruction is not complete and some saliva manages to seep through or around calculi. Long term obstruction can lead to atrophy of the gland. In earlier stages of sialolith may be too small or insufficiently mineralised to be visible on radiographs. Around 20% submandibular gland sialolith and 40% of parotid ones are radiolucent due to low mineral component of the secretion. [9] Parotid calculi are less common than calculi in submandibular gland because the former is primarily serous. Parotid calculi are uncommon rarely attaining the size of calculi found in Wharton's duct. [9] When sialolith is present in parotid duct, on periapical film they may be superimposed over maxillary molars or posterior alveoli. [11] Due to local tissue reaction and overlying structures parotid stones as a rule it is difficult to visualize by conventional radiographs. However, symptoms suggestive of salivary gland obstruction warrant plain film radiography of major salivary gland in order to visualise possible radiopaque sialolith. Panoromic or lateral oblique and anteroposterior projections are used to visualize the parotid glands. Panoromic views overlap anatomic structures that can mask the presence of a salivary stone. A standard occlusal film can be placed intraorally adjacent to the parotid gland to visualize a stone close to gland orifice. Sialography is a technique to detect salivary gland calculi and the whole ductal

system. It is radiographic visualization of salivary gland following retrograde instillation of soluble contrast material into the ducts. Ductal obstruction due to sialolith, tumour or strictures can be recognised by sialography. The two contraindications are acute infections and allergy to contrast media. Sialography performed during acute infection may further irritate and potentially rupture the already inflamed tissue. Additionally the injection of contrast media might force the bacteria throughout the ductal system and worsen the infection. The radiographs views for sialography include panoramic, lateral oblique and anterio-posterior views. Computed tomography is adequate for diagnosing sialolithiasis only if stone is large or if radiological slices are performed every millimeter. Lack of precise localisation of stone and absence of visualization of duct and their anomalies are disadvantage of computed tomography. [12] Sialoendoscopy is a technique used to visualize and subsequently remove the sialolith. Sialoendoscopy where a small probe is attached to specially designed endoscopic unit can explore primary and secondary duct system. A very thin tube with tiny light and camera at the tip is inserted into the salivary duct. The endoscopic units also have a surgical tip that can obtain soft tissue biopsy and help to remove calcified materials using minimally invasive technique under local anesthesia. Ultrasonography is useful in differentiated diagnosis of disease of salivary gland. Sialolithiasis appears as markedly hyper echoic lines points with distal acoustic shadowing. Ultrasonography can be used to differentiate between solid versus cystic lesions of the gland, also to differentiate intrinsic from extrinsic disease and helpful in identification of abscess formation. MR sialography is a new diagnostic procedure with promising results. It consists of 3 mm T_2weighted fast spin echo slides, performed in sagittal and axial planes. It is rapid, non-invasive technique which requires no dye injection and irradiation.

The first aim of treatment is to relieve pain and infection. In acute phase the therapy is primarily supportive Patient will require antibiotics and pain killers for relief of pain and infection. Small sialolith of major gland sometimes can be treated conservatively by gentle massage of gland in effort to milk the stone towards the duct orifice. Sialogogues, moist heat and increased fluid intake also promote passage of stone. The further treatment depends on position of calculi. If the calculi is at the distal end of duct, enlargement of orifice either by dilation will usually allow calculus to be delivered into mouth. Larger sialolith usually needs to be removed surgically. If calculus is near the gland, then a superficial conservative parotidectomy with removal of much of duct as possible. Alternative methods of treatment have emerged such as use of extracorporeal shock wave lithotripsy and more recently use of endoscopic shock wave therapy (ESWL) in which shock waves are delivered to the surface of the stone Lodged within the duct without damaging the adjacent tissue. [13] Increased demands for minimally invasive surgery and recent technological advances have led to the development of number of conservative options for therapeutic management of obstructive salivary disorders such as calculi and duct stenosis. These include extracorporeal shock wave lithotripsy, sialoendoscopy, laser intracorporeal lithotripsy, interventional radiology, the video assisted conservative surgical removal of parotid and submandibular calculi and botulinum toxin therapy. [14] Each of these technique may be used as single therapeutics modality or in combination with one or more of above mentioned options usually in day case or one day case under local anaesthesia or general anaesthesia, Shock

wave treatment (lithotripsy) uses ultrasound waves to break up stones. The broken fragments then pass along the duct & removed.

ESWL is an effective non invasive treatment approach to be performed in all patients with sialolithiasis reserving surgery for recurrence or complicated sialolithiasis. [15] ESWL is particularly important when treating parotid gland calculi in account of its great efficacy in this site. Parotid gland stones should be treated with ESWL even when dealing with recurrent calculi due to surgical risk in this area. This non invasive method of fragmenting salivary stones into smaller portions in order to favour their possible flushing out from salivary duct system spontaneously or after salivation induced by citric acid or other sialogogues. The main limitations of ESWL is that it does not always completely clear the calculus but leaves stone fragments inside the duct system that may subsequently become the nidus of recurrent sialolithiasis. The Reported untoward effects are skin pain, glandular swelling, duct heamorrhage and cutaneous petechiae. Intra corporeal shock wave therapy is in which shock wave reach the stone surface through lithotripsy probe placed inside the salivary duct system under endoscopic guidance. The energy needed to fracture the stone is usually provided by means of laser beam, pneumatic device or electrohydraulic probes. [16] Sialoendoscopy has been used to retrieve small (less than 5mm) mobile stones from submandibular or parotid gland using micro forceps or baskets. Owing to development in optical technology, micro endoscopes are available commercially that allow inspection and micro instrumentation of salivary duct system. Larger or fixed parotid stones are mainly treated by extra corporeal lithotripsy supplemented with endoscopy removal of residual fragments as required. Sialoendoscopy was first described by Katz who used 0.7mm flexible endoscope to remove salivary stones with dormia basket. Since various rigid, semi rigid and moderately flexible devices with working channels and irrigation ports have been developed, a new flexible semi rigid instrument in ninitol has been recently been described. [17] The absolute contraindication to procedure is complete distal obliteration of duct that is impenetrable by the endoscope. The most frequent side effect is transient glandular swelling due to irrigation with physiological solution in 80-100% of cases, temporary lingual paresthesia, ranula formation, lacerations, ductal strictures and bleeding has been described. Each of the technique may be used as single therapeutic modality or in combination with one or more of above mentioned options usually in day case or one day case under local or general anaesthesia. A parotid stone located at the confluence of collecting duct can be released surgically by raising a pre auricular flap exposing the parotid duct and incising it longitudinally to release the stone. Complications of parotid surgeries include general risk associated with anaesthesia, post operative bleeding, facial nerve weakness, numbness of face and ear, and Frey's syndrome. The risk of temporary post operative paresis of facial nerve is as 15% to 25% after superficial parotidectomy and 20 to 25% after total parotidectomy whereas permanent facial nerve paresis is reported as 5-10%.[18] Permanent facial nerve paralysis following superficial or total parotidectomy is rare except when branches of facial nerve have been deliberately sacrificed. The facial nerve or its branches are sacrificed as a result of a macroscopic tumour involvement; an immediate nerve graft may be undertaken using micro neural techniques. Temporary weakness due to neurapraxia occurs in approximately 30% of operation but recovers rapidly usually within six weeks. Gustatory sweating (Frey's syndrome) is

regular sequel to parotidectomy occurring up to 54% of cases. [18] Rare complications such as sialocele or salivary fistula occasionally follow parotidectomy, which are managed conservatively and resolve spontaneously after days or weeks.

REFERENCES

1. Leung AK, Choi MC, Wagner GA.Multiple sialolith and a sialolith of unusual size in submandibular duct.Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 1999; 87; 331-333.
2. Cawson RA. Essentials of oral pathology and oral medicine 7th ed. Edinburgh Churchill livingstone 1998.255-256
3. Steiner M, Gould AR, Kushner GM, Weber R, Pesto A. Sialolithiasis of submandibular gland in 8 year old child. Oral Surg Oral Med Oral Pathol Oral RadiolEndod1997;83:188.
4. Tepan MG, Rohiwal RL.Multiple salivary calculi in wharton's duct. J LaryngolOtol1985;99:1313-1314.
5. Schenkels LC, Veerman EC, Nieuw Amerongen AV. Biochemical composition of human saliva in relation to other mucosal fluids.Crit Rev Oral Biomed 1995; 4:271-277.
6. William MF. Sialolithiasis. Otolaryngologic clinics of north America 1999;32: 819-834.
7. Koch M, Zenk J, Bozzato A, Bumm K, Iro H.Sialoscopy in case of unclear swelling of major salivary glands. Otolaryngol Head Neck Surg;133:863-8.
8. Park MJ, Mandel L. Parotid stone removal. NY state Dental J 2007;73(1): 54-56.
9. Bodner L. Parotid sialolithiasis. J LaryngolOtol 1999; 113:266-267.
10. Blair JR.Diagnosis and treatment of parotid calculi.Laryngoscope. 1955; 65(9):848-54.
11. J. Lustmann, E. Regev, Y. Melamed. Sialolithiasis,a survey of 245 patients and a review of literature Int J oral maxilla facsurg 1990; 19:135-138.
12. Avrahami E, Englender M, Chen E, Shabtay D, Katz R, Harell M. CT of submandibular gland sialolithiasis neuroradiology 1996; 38:287-290.
13. Iro H, Schneider T, Nitsche N, Waitz G, Marienhagen J, Ell C. Extracorporeal shock-wave lithotripsy of a salivary stone. Dtsch Med Wochenschr. 1990; 115(1): 12-4.
14. Capaccio P, Torretta S, Ottavian F, Sambataro G, Pignataro L.Modern management of obstructive salivary disease.Actaotorhinolaryngolital2007; 27(4):161-172
15. Andretta M, Tregnaghi A, Prosenikliev V, Staffieri A . Current opinions in sialolithiasis diagonosisand treatment. ActaoctorhinolaryngolItal 2005; 25(3) 145-149.
16. Nahlieli O, BaruchinAM.Endoscopic technique for diagnosis and treatment of obstructive salivary gland disease.J Oral Maxillofacial Surg 1999; 57:1394-1401.
17. Zenk, M Koch, ABozzato, H Iro. Sialoscopy:Intial exposure with new endoscope.Br J oral maxilla facsurg 2004; 42:293-8.
18. Zernial O, Springer IN, Warnke P, Härle F, Risick C, Wiltfang J.Long term recurrence rate of pleomorphic adenoma and post operative facial nerve paresis.J Craniomaxillofac Surg. 2007; 35(3): 189-92.

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