

Marsupialization of Stensen's Duct: Revisiting Sialolith Management

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Abstract

Sialoliths, needless to say, are an extremely common entity for an otorhinolaryngologist. There's a parade of causation behind the same. Parotid duct stone relatively stands as an uncommon occurrence. Not only proper and timed diagnosis arise as an important factor, but also clinical expertise and diagnostic simplicity play a vital role in providing patient relief.

Keywords: Marsupialization, Stensen's duct, Parotid duct, Parotid sialolith, Sialolithiasis, Salivary stone.

Introduction

Parotid region swellings are an everyday finding in an otolaryngology setup. With a multifactorial causation, sialolithiasis of Stensen's duct, though rare, stands as an important attribution. Both, local and systemic reasons have an essential participation in the formation of calculi. We here describe a case of a 28 year old lady whose parotid duct sialolith was managed on the basis of simpler, yet effective interventional techniques.

Case Report

A 28 year old female presented to our outpatient department with complaints of recurrent episodes of swelling over the left preauricular region since 4 years. The swelling was associated with pain and intermittent fever. Brief history revealed pain to be perimastication coupled with the swelling. Bimanual oral examination made a centimetre sized diffuse swelling over the left maxillary molar palpable, with a sub-centimetre sized stony hard feel within. On milking the gland there was no secretory expression. A series of bloodwork was done to exclude other infective causes for the presentation and initially conservative treatment was given. An ultrasonography (USG) of the swelling suggested parotitis which later subsided with the antibiotic treatment given. The USG also revealed presence of a calculus in the left parotid ductal system with mild ductal dilatation. With a normalised blood

count and minimal imaging due to patient's financial constraints, she was posted for removal of the parotid duct sialolith under local anaesthesia. A small incision was placed over the left buccal mucosa opposite the second molar. The left parotid duct was exposed, papilla separated and edges were everted. The calculus was expressed out quickly which measured 7mm x 2mm. Marsupialization was done. The procedure was uneventful with minimal blood loss. Patient was discharged with an immediate symptomatic relief and a week long oral antibiotic therapy.



Fig. 1: Eversion of Papilla



Fig. 2: Stone expelled out from the duct



Fig. 3: 3 Weeks post operative

Discussion

The human salivary system is mainly summed up by three pairs of major salivary glands and numerous minor salivary glands dispersed underneath the buccal mucosa. These play a pivotal role in maintaining homeostasis in the oral cavity.¹ Formation of sialoliths (Greek: sialon- saliva; lithos- stone) is a common disorder. Its causation is accredited to a wide range of factors including dehydration, anticholinergic and other drugs, mechanical trauma, masses- neoplastic or otherwise, systemic diseases such as Sjogren's syndrome,² hypertension, diabetes, hyperparathyroidism,³ gout, radiotherapy to head and neck,⁴ renal impairment,⁵ pH alterations, strictures or kinks, mucous plugs, foreign bodies or simply old age. Sialolithiasis mostly occurs in the submandibular glands (80-85%), with lesser likability in the parotid (5-10%) and sublingual (0-5%) glands.⁸ These calculi are a more frequent occurrence in adulthood with a relatively rarer paediatric presentation. Preponderance is found in male population over females.⁸ With much of an overlapping symptomatology, the difference in presentation parallels the type of the glands involved. Many cases are clinically silent until some obstructive pathology befalls. The commonest presentations include swelling associated with the gland involved i.e. in the submandibular or parotid region, pricking pain typically allied with mastication or gustation (Salivary colic). The disease hence is aptly termed as Meal-time syndrome as the signs are peri-prandial and are sustained according to the salivary flow.⁹ Symptom free intervals having been commonly publicized. The high possibility of submandibular calculi formation is chemically reflected by the fact of high alkalinity in its

secretions, escalated calcium content and a strong parasympathetic secretory drive. Mechanically, factors such as longer and irregular duct, more dependant location and smaller orifice in a high pressure area escalate the chances of stone formation.¹⁰ When it comes to parotid, the largest salivary gland, the duct of Stenson is around 5cm in length with 0.4-0.6mm as its internal calibre. It enters the oral cavity opposite the second upper molar at the parotid papilla.¹¹ The secretions are serosanguinous. The concretions are composed of both organic and inorganic matters with a ratio of 51:49 in parotid calculi.¹¹ The main participants of these are calcium phosphate, smaller amounts of carbonates in the form of hydroxyapatite with also magnesium, potassium and traces of ammonium.¹¹ Growth rate of a salivary calculus according to the date is estimated to be around 1-1.5 mm/year.¹² There still remain discrepancies in the theories of stone formation referred to hitherto.¹³⁻¹⁷ To frame a proper treatment modality, an essay of investigations and imaging has been publicized from time to time. The ideal imaging technique, however, should not only be harmless but also be widely available, with a good diagnostic value and be cost effective, especially in a third world country. The imaging typically espouses X-rays, ultrasonography, sialography, CT scan, MRI, sialoendoscopy and other advancing techniques.^{18,19} The standard radiography although being inexpensive limits itself at not revealing radiolucent or intraglandular stones.²⁰ Sialography is widely available, or for that matter sialoendoscopy, is an efficiently precise procedure with a better cure rate however is invasive, may excite acute sialadenitis, ostial injuries or may even cause scarring to the fancy of its expenses.²¹ CT scans draw the line at subjecting the patient to radiation and the possibility to occult the stone with thick slices and non-precise intraductal information.²² Functional imaging modalities like diffusion weighted imaging (DWI) or positron emission tomography stand with high accuracy but fetch results for complicated findings i.e. biological behaviour and vascular patterning, are seldom useful for simple calculi and highly expensive.²³ Also, they do not provide optimum evaluation on ductal system. It thus follows that with restriction of financial capacity, clinical expertise of

the diagnostician and wide availability, USG turns out as an excellent first line investigation in our experience.^{24,25} Being a quick procedure with zero patient harm, it can also be performed in a poorly cooperative patient and allows even vascular evaluation paired with a doppler.²⁶ Adoption of a proper therapy is an important factor. Traditional ultimate management possibilities encompass duct dilatation, dissection and sialadenectomy. Many studies have suggested that the gland function resumes to normal post elimination of obstructive pathology. The current trends thus include Extra Corporeal Shockwave Lithotripsy (ESWL), Intra Corporeal Shockwave Lithotripsy (ISWL- endoscopic guided/ pneumatic/ electro hydraulic), operative Sialoendoscopy, Interventional Radiology and injection botulinum toxin.^{19,27,28} With the advent of newer, finer surgical techniques, there's provision of better outcomes with better efficacy. Fewer rates of complications have been established. They, though, carry a drawback of either being invasive and /or being expensive. On the contrary, we have observed that simply adopting eversion of papilla with marsupialization under local anaesthesia offers quick relief. This procedure in spite of being simpler, quicker seems, yet forgotten in recent times to the fancy of modern therapeutic interventions. In addition to that it also provides an excellent cost restrained outcome, minimal complication and therefore patient satisfaction.

Conclusion

Parotid duct calculi is a rarer finding. The line of management inheres a detailed history, proper examination, clinical dexterity of the diagnostician and a befitting line of precise imaging technique. Even with the advent of newer glorified and somehow arduous techniques, the surgical and expense effectiveness of simpler technique like marsupialization should not be forgotten. Patient satisfaction can thus be readily achieved in a minimalistic way.

Source of Funding

None.

Conflict of Interest

None.

References

1. Ghannam MG, Singh P. Anatomy, Head and Neck, Salivary Glands. InStatPearls [Internet] 2019 Feb 19. Stat Pearls Publishing.
2. Capaccio P, Minetti AM, Manzo R, Palazzo V, Ottaviani F. The role of the sialoendoscopy in the evaluation of obstructive salivary disease. *Int J Maxillo Odontostomatol* 2003;2(1):9-12.
3. Stack BC Jr, Norman J. Sialolithiasis and primary hyperparathyroidism. *ORL J Otorhinolaryngol Relat Spec* 2008;70:331-4
4. Ship JA. Diagnosing, managing, and preventing salivary gland disorders. *Oral Dis* 2002;8(2):77-89.
5. Sharma RK, Al-Khalifa S, Paulose KO, Ahmed N. Parotid duct stone—removal by a dormia basket. *J Laryngology Otol* 1994;108(8):699-701.
6. Ngu RK, Brown JE, Whaites EJ, Drage NA, Ng SY, Makdissi J. Salivary duct strictures: nature and incidence in benign salivary obstruction. *Dentomaxillofac Radiol* 2007;36(2):63-7.
7. Eigner TL, Jastak JT, Bennett WM. Achieving oral health in patients with renal failure and renal transplants. *J Am Dent Assoc* 1986;113(4):612-6.
8. Hasson O. Modern sialography for screening of salivary gland obstruction. *J Oral Maxillofacial Surg* 2010;68(2):276-80.
9. Jacob A, Regina. A case report on meal time syndrome. *Int J Otorhinolaryngol Head Neck Surg* 2019;5:794-6.
10. Rani SR, Suragimath G, Bijjaragi S, Shetty PK. Mealtime syndrome: An enigma to resolve. *J Adv Med Dent Sci* 2014;2:120-3.
11. Palai A, Sen S, Saha S. Multiple parotid calculi: a rare case presentation. *Egypt J Otolaryngol* 2016;32(3):240.
12. Gadipelly S, Srilatha T, Sheraz BS, Vijaykumar N. Parotid Sialolith-A Case Report and Review of Literature. *Int J Contemp Med Res* 2016;3(4):1211-3.
13. Faklaris I, Bouropoulos N, Vainos NA. Composition and morphological characteristics of sialoliths. *Crystal Res Technol* 2013;48(9):632-40.
14. Kogan S, Zeng Q, Ash N, Greenes RA. Problems and challenges in patient information retrieval: a descriptive study. InProceedings of the AMIA Symposium. *Am Med Inform Assoc* 2001:329.
15. Marchal F, Kurt AM, Dulguerov P, Lehmann W. Retrograde theory in sialolithiasis formation. *Arch Otolaryngol-Head & Neck Surg* 2001;127(1):66-8.
16. Marchal F, Becker M, Dulguerov P, Lehmann W. Interventional sialendoscopy. *Laryngoscope* 2000;110(2):318.
17. Teymoortash A, Wollstein AC, Lippert BM, Peldszus R, Werner JA. Bacteria and pathogenesis of human salivary calculus. *Acta oto-laryngologica* 2002;122(2):210-4.

18. Epivatianos A, Harrison JD, Dimitriou T. Ultrastructural and histochemical observations on microcalculi in chronic submandibular sialadenitis. *J Oral Pathol Med* 1987;16(10):514-7.
19. Rastogi R, Bhargava S, Mallarajapatna GJ, Singh SK. Pictorial essay: Salivary gland imaging. *Indian J Radiol Imaging* 2012;22(4):325.
20. Marchal F, Dulguerov P. Sialolithiasis management: the state of the art. *Arch Otolaryngol-Head Neck Surg* 2003;129(9):951-6.
21. Schratte M, Steiner E, Imhof H. Conventional roentgen diagnosis of the salivary glands. Still of clinical value or "traditional care". *Der Radiologe* 1994;34(5):248-53.
22. Hasson O. Modern sialography for screening of salivary gland obstruction. *J Oral Maxillofac Surg* 2010;68(2):276-80.
23. Koch M, Zenk J, Bozzato A, Bumm K, Iro H. Sialoscopy in cases of unclear swelling of the major salivary glands. *Otolaryngol-Head Neck Surg* 2005;133(6):863-8.
24. Morimoto Y, Ono K, Tanaka T, Kito S, Inoue H, Shinohara Y et al. The functional evaluation of salivary glands using dynamic MR sialography following citric acid stimulation: a preliminary study. *Oral Surg, Oral Med, Oral Pathol, Oral Radiol, Endodontol* 2005;100(3):357-64.
25. Yoshimura Y, Inoue Y, Odagawa T. Sonographic examination of sialolithiasis. *J Oral Maxillofac Surg* 1989 Sep 1;47(9):907-12.
26. Födra C, Kaarmann H, Iro H. Sonography and plain roentgen image in diagnosis of salivary calculi-experimental studies. *HNO* 1992;40(7):259-65.
27. Arijji Y, Yuasa H, Arijji E. High-frequency color Doppler sonography of the submandibular gland: relationship between salivary secretion and blood flow. *Oral Surg Oral Med, Oral Pathol, Oral Radiol, Endodontol* 1998;86(4):476-81.
28. Moghe, Swapnil. "Parotid sialolithiasis." *BMJ Case Rep* 2012;bcr2012007480. 14 Dec. 2012, doi:10.1136/bcr-2012-007480

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