Sialolithiasis Involving Parotid Gland: A Case Report and Literature Review

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Abstract
Sialolithiasis is the formation of calcific concretions within the ductal system of a major or minor salivary gland. Approximately 10-20% of stones are found in the parotid gland and 1-5% in the sublingual gland. On classic radiographs; intraglandular and small stones may be missed and only about 20% of sialoliths are radiopaque. Treatment of parotid calculi includes conservative measures like increased hydration, milking of the stenson’s duct. Extent of surgical treatment depends on the position of the calculi. The present article reports a case of parotid gland calculus in the stenson’s duct and review of the literature.

Keywords: Parotid; sialolithiasis; salivary gland.

Introduction
Sialolithiasis is the formation of calcific concretions within the ductal system of a major or minor salivary gland. Salivary stones are the most frequent pathology encountered in non-tumoral diseases of salivary glands. Salivary stones are mainly composed of calcium oxalate and calcium phosphate associated with a thickened mucus and cellular debris. Primary etiologic factors triggering formation of salivary calculi include: a) salivary stagnation due to neurohumoral condition, b) nidus for stone formation and c) precipitation of salivary salts due to metabolic metabolism into the matrix in the presence of coexisting inflammation. Commonly, sialolithiasis presents with painful swelling (59%), painless swelling (29%), and pain only (12%). The typical history in patients with a parotid calculus is of more or less intermittent pain and swelling, usually with meals or when brushing the teeth. The feature of brief attacks, lasting for minutes or hours, while often encountered, is not as dominant as it is in patients with submandibular salivary gland stones, because the submandibular duct is wider, the stone dislodges more easily, and relief of pain is faster.

The submandibular salivary gland is the most common site for stone formation, given that around 60-90% of the stones are reported to be located in this gland. Approximately 10-20% of stones are found in the parotid gland and 1-5% in the sublingual gland. On classic radiographs, intra-glandular and small stones may be missed and only about 20% of sialoliths are radiopaque. CT allows visualization of large stones but without their precise localization and without the possibility of assessment of the ducts. Proper history with clinical examination will differentiate sialolithiasis from other salivary disorders such as mumps, sialosis, sialadenitis. Treatment modalities for sialolithiasis range from conservative “milking of gland” to extensive excision of the gland in some instances. Stones can be washed out by stimulating increased salivation using sialogogues combined with gland massage and if necessary, bougie gauge of the secretory duct using canula. When these methods are unsuccessful and the stones are close to the opening of the main salivary duct, it may be possible to extract them after dilatation or dissection of the duct. Surgery, however, carries risks such as the possibility of injury to facial nerve, lingual nerve and hypoglossal nerve or the occurrence of Frey’s syndrome. Extra-corporeal shock wave lithotripsy (ESWL) is another minimally invasive alternative to surgery for treatment of salivary calculi. Extra-corporeal shock wave lithotripsy uses shock waves to crush the calculi which are smaller than 2mm. The authors present a case of sialolithiasis involving parotid gland which was successfully excised under local anesthesia.

Case report
A 45-year-old male patient presented to the College of Dentistry, King Khalid University, Abha, Kingdom of Saudi Arabia with complaint of pain and intermittent swelling on the lateral side of the face. Detailed history revealed intermittent swelling which increased during meal times. As shown in Figure 1, the intra-oral buccal mucosa was inflamed and slightly tender. Patient was ruled out for systemic diseases. Intra-oral palpation was not confirmatory. Orthopantomogram revealed a well circumscribed radio-opaque mass of 0.5X0.5 cms lateral to the ramus of the mandible (Figure 2). As shown in Figure 3, CT scan revealed a calculus in the parotid duct region. Under local anesthesia, the parotid calculus was approached through an intraoral incision. Blunt dissection through the buccinator muscle was performed and the calculus excised from the extra-glandular portion of the parotid gland as shown in Figure 4. The specimen as shown in Figure 5 was sent for histopathological examination which confirmed the diagnosis of parotid calculus. Stenson’s duct was sutured to the surrounding buccal mucosa to avoid stricture and fibrosis of the duct. Patient was prescribed a course of antibiotics and analgesics for 5 days. Post-operative healing was uneventful.

Discussion
Salivary duct lithiasis is a condition characterized by the obstruction of a salivary gland or its excretory duct due to the formation of calcareous concretions or sialoliths resulting in salivary ectasia and even provoking the subsequent dilatation of the salivary gland. According to Shafer, sialoliths are thought to form by deposition of calcium salts aroun

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and a central nidus which may consist of desquamated epithelial cells, bacteria, products of bacterial decomposition or foreign bodies. Salivary gland pathologies are traditionally divided into neoplastic and non-neoplastic, the latter being the most frequent, consisting mainly of intraductal stones and stenosis. The pathogenesis of salivary gland calculi appears to be related to the pH of the saliva. pH of the parotid saliva is around 6.3-7.4. Most salivary stones occur in the submandibular gland (80-90%), whereas 5-20% are found in the parotid gland. The sublingual gland and the minor salivary glands are rarely affected. The right and left sides are equally affected, whereas bilateral sialolithiasis is rare. When parotid glands are involved, calculi are most often single and located within the ductal system; intra-parenchymal sialoliths are rarely diagnosed. Kaufman reported parotid sialolithiasis in a 4-year-old girl and is supposedly the second case of parotid sialolithiasis in the English literature as reported by them. Doku and Berkman and Cornell Mc Cullom et al., stated that sialolithiasis is a rare occurrence in children. They reported a case of sialolithiasis in an 8-year-old girl. Kaswan et al., conducted a study involving 196 patients to assess the relationship between pulp calcifications and salivary calcifications.

They concluded that there is no significant relation between pulp stones and salivary calcifications. Izumi et al., conducted a study involving 30 patients to investigate computed tomography (CT) and clinical features relating to calcifications within the parotid gland of patients with Sjogren's syndrome. Fourteen of their patients with Sjogren's syndrome had parotid calculi and all of these stones were in the parotid gland and not in the duct. Stenoza et al., stated that salivary ductal stenosis occur more frequently in the parotid ductal system than in the submandibular one. This may be one of the reasons for calculi formation. They also classified salivary gland pathologies, stenosis, sialolithiasis endoscopically into different grades. When assessing patients with parotid swelling, physical examination should always include palpation of the gland and simultaneous observation of salivary flow from the Stenson's duct ostium. The clinical symptoms of parotid calculi are very obvious with intermittent swelling and pain at meal times. Classic clinical manifestations of an obstructed sub mandibular salivary gland are: enlargement of gland with associated tenderness to palpation. Skin over the gland is usually erythematous. In almost all cases, there will be reduced salivary flow. As such, history of dry mouth
in the recent past must not be missed. As acute sialedinitis invariably leads to infection and consequent pus discharge from the duct, antibiotic therapy seems logical. As widely reported and accepted in the literature, parotid calculi are usually smaller than the salivary calculi with the average size of parotid calculi being less than 1 centimeter. Intraoral radiographs are usually sufficient to localize the parotid calculi when they are in the ductal portion. Sreetharan and Philip stated that ultrasonography may be a good first line in investigative modality. Kahan stated the widely accepted fact that obstruction of the salivary duct due to sialolithiasis is the most frequent etiology. As such a diagnostic modality that outlines the ductal architecture and level of obstruction i.e., sialography is essential. Magnetic resonance sialography is an advanced investigative modality which does not require contrast injection and ductal cannulation. Scintigraphy is used for sialolithiasis when sialography is not indicated.

Treatment of parotid calculi includes conservative measures like increased hydration, milking of the Stenson’s duct. Extent of surgical treatment depends on the position of the calculi. If the parotid calculus is extra-glandular and external to the buccinator muscle, then simple slit like incision near the papilla of the duct aids in removal of the stone. If the calculus is intra-glandular, a more extensive surgical excision of the gland needs to be performed. Complications associated with parotid calculi include hemorrhage, infection, facial nerve paralysis, post-operative hematoma.

References

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