

## PAROTID SIALOLITHIASIS – REVIEW AND REPORT OF A CASE

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Sialoliths are calcified organic matter that forms within the secretory system of the major salivary glands. Salivary gland calculi account for the most common disease of the salivary glands, and may range from tiny particles to several centimeters in length. The majority of sialoliths occur in the submandibular gland or its duct and is a common cause of acute and chronic infections. While the majority of salivary stones are asymptomatic or cause minimal discomfort, larger stones may interfere with the flow of saliva and cause pain and swelling. The prevalence of sialoliths varies by location. Sialolith in the parotid glands is less common when compared with that of submandibular gland. This case report describes a patient presenting with parotid gland sialolith and review of the literature regarding the salivary sialolithiasis.

**KEY WORDS:** Parotid Gland; Sialolith; Sialography; Nidus; Lithotripsy.

**INTRODUCTION**

The deposition of calcium salts, primarily calcium phosphate, usually occurs in the skeleton. When it occurs in an unorganized fashion in soft tissue, it is referred to as heterotopic calcification. Heterotopic calcification which results from deposition of calcium in normal tissue despite normal serum calcium and phosphate levels is known as idiopathic calcification. Sialoliths belongs to the category of idiopathic calcification.<sup>1</sup> Sialoliths are calcareous deposits in the ducts of major or minor salivary glands or within the glands themselves. Sialolithiasis accounts for more than 50% of diseases of the major salivary glands and is thus the most common cause of acute and chronic infections.<sup>2</sup>

**Case Report**

A 25 year old male patient reported to the Department of Oral medicine and Radiology with a chief complaint of swelling in the right cheek region since 3 to 4 months. The swelling was intermittent in nature, usually present at the time of eating and was associated with mild pain. There were no significant findings in the patient's medical or dental history, including any trauma to that region. On extraoral examination, a solitary diffuse swelling was located in the right middle one third of face over the parotid region(**Fig. 1**). The skin over the swelling

was appearing normal. On palpation the swelling was mild tender, firm in consistency with pinchable overlying skin. Intraorally, no pathological abnormality was detected (**Fig. 2**). Appearance of parotid papilla was normal with adequate salivary flow. Depending on the history and clinical examination a provisional diagnosis of parotid sialolithiasis was made.

Patient was then subjected for radiographic examination. The puffed cheek PA view revealed solitary minute well defined radioopaque area present lateral to the middle portion of ramus of mandible (**Fig.3**). Sialography done in relation to right parotid gland revealed filling defect with adjacent dilatations of the duct(**Fig.4**). Ultrasonography showed the evidence of mild diffuse enlargement of the parotid gland and 6 mm. curvilinear calculus in the distal parotid duct with proximal dilation of the duct (**Fig.5**). CT scan revealed minimally enlarged right parotid gland and dilated parotid duct with 5.5 mm calculus present in the duct (**Fig. 6**).

Depending on the above investigations a diagnosis of right parotid duct calculus was made and at a subsequent appointment the stone was removed under local anaesthesia by extraoral approach (**Fig. 7 and Fig. 8**).



Fig.1. : Extra oral photograph



Fig .2. : Intra oral photograph



Fig .3. Puffed cheek PA view

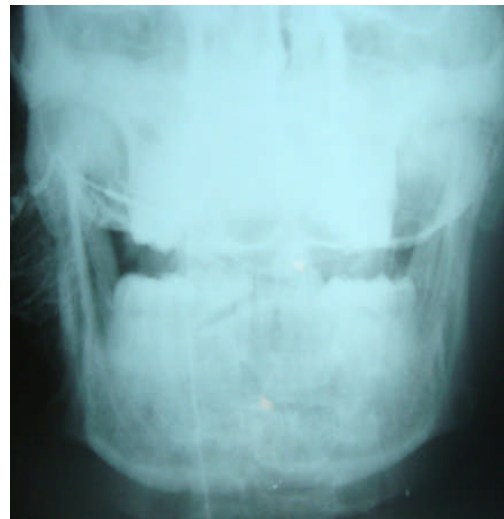


Fig .4. PA view taken after injecting the dye in to right parotid gland

**Discussion**

Sialolithiasis is the most common disease of salivary glands. It is estimated that it affects 12 in 1000 of the adult population.<sup>3</sup> Males are affected twice as much as females.<sup>4</sup> It involves most commonly the major salivary glands. More than 80% of the sialoliths occur in the submandibular gland or its duct, 6% in the parotid gland and 2% in the sublingual gland or minor salivary glands.<sup>2</sup>

The exact etiology and pathogenesis of salivary calculi is unknown. They are thought to occur as a result of deposition of calcium salts around an initial organic nidus consisting of altered salivary mucins, bacteria and desquamated epithelial cells.<sup>4,5</sup> According to the literature, formation of sialolith can occur in two phases: a central core and a layered periphery.<sup>6</sup> The central core is formed by the precipitation of salts, which are bound by certain organic substances. The second phase consists of the layered deposition of organic and inorganic material.<sup>7</sup> Parotid stones are thought to form most often around a nidus of inflammatory cells or a foreign body.<sup>8</sup> whereas Submandibular stones are thought to form around a nidus of mucous. Another theory has proposed that an unknown metabolic phenomenon can increase the salivary bicarbonate content, which alters calcium phosphate solubility and leads to precipitation of calcium and phosphate ions.<sup>9</sup> A retrograde theory proposed for sialolithiasis suggested that, substances or bacteria within the oral cavity might migrate into the salivary ducts and become the nidus for further calcification<sup>6</sup>. Salivary stagnation, increased alkalinity of saliva, infection or inflammation of the salivary duct or gland, and physical trauma to salivary duct or gland may predispose to calculus formation.<sup>3</sup>

Clinically sialoliths are round or ovoid in shape, rough or smooth in texture and yellowish in color. Submandibular stones consist of 82% inorganic material and 18% organic material whereas parotid stones are composed of 49% inorganic and 51% organic material<sup>2</sup>. The inorganic material comprises of calcium phosphate, smaller amounts of carbonates in the form of hydroxyapatite and smaller amounts of magnesium, potassium, ammonia. Whereas organic material consists of various carbohydrates and amino acids.<sup>9</sup>

Sialoliths are usually unilateral. Sialolithiasis typically causes pain and swelling of the involved salivary gland by obstructing the salivary flow. Calculi may cause stasis of saliva, leading to bacterial ascent into the parenchyma of the gland resulting in sialadenitis. Some sialoliths may be asymptomatic. Long term obstruction, in the absence of infection can lead to atrophy of the gland with resultant lack of secretory function and ultimately fibrosis.<sup>9</sup>

Careful history and examination are important in the diagnosis of sialolithiasis. Pain and swelling of the concerned gland at mealtimes and in response to other salivary stimuli are important. Complete obstruction causes constant pain, swelling and signs of systemic infection may be present<sup>10</sup>. Bimanual palpation of the floor of the mouth, in a posterior to anterior direction, may reveal a palpable stone in majority of the cases of submandibular calculi. For parotid stones, careful intraoral palpation around Stenson's duct orifice may reveal a stone.<sup>9</sup> Deeper parotid stones are often not palpable. When minor salivary glands are involved they are usually in the buccal mucosa or upper lip, forming a firm nodule that may mimic tumour. Imaging modalities, both conventional and advanced are very useful in diagnosing sialolithiasis. 40% of parotid and 20% of submandibular stones are usually radiolucent. In such patients sialography will be helpful. However, it is contraindicated in acute infections or in patients having allergy to the contrast agents.<sup>9</sup>

Patients presenting with sialolithiasis may benefit from conservative management, especially if the stone is small.<sup>9</sup> The patient must be well hydrated and the clinician must apply moist warm heat and along with massage of the gland. Sialogogues are useful to promote production of saliva and to flush the stone out of the duct. In case of sialoliths associated with sialadenitis, a penicillinase resistant anti - staphylococcal antibiotic will be preferable. Most stones will respond to such a regimen, combined with simple sialolithotomy when required.<sup>8,10</sup> Parotid stone management is more problematic as only a small segment of Stenson's duct is approachable through an intraoral incision. As a result, parotidectomy is the mainstay of surgical management for the majority of



Fig.5. Ultrasonographic appearance of right parotid gland

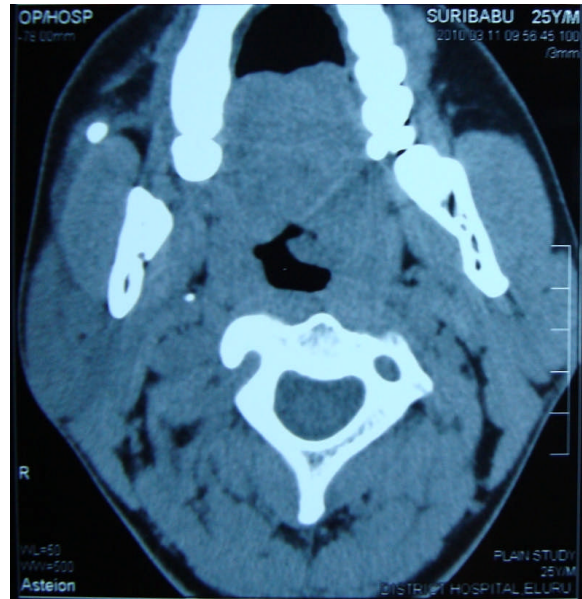


Fig .6. CT scan axial view showing sialolith



Fig .7. : Sialolith removal by extraoral approach



Fig .8. : Specimen photograph

Intra glandular stones. This is reserved for patients whose symptoms do not respond to conservative therapy and suffer from recurrent pain and swelling. Alternative methods of treatment have emerged such as the use of extracorporeal shock wave lithotripsy (ESWL) and more recently the use of endoscopic intracorporeal shockwave lithotripsy (EISWL), in which shockwaves are delivered directly to the surface of the stone lodged within the duct without damaging adjacent tissue (piezoelectric principle). Salivary lithotripsy will be more useful therapeutically than surgical removal of the affected gland, as it prevents the risk of a general anaesthesia, facial nerve damage, surgical scar, Frey's syndrome, and causes little discomfort to the patient with preservation of the gland.<sup>11</sup>

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