Oversized Submandibular Gland Sialolith: A Report of Two Cases

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Abstract Sialolithiasis is a very common reason in causing obstructive salivary gland disease. Its incidence in males is more than females and children. They usually occur in submandibular ducts or gland and are 1 mm to less than 1 cm and rarely more than 1 cm. If they are more than 15 mm then, are termed as sialoliths of unusual size or giant sialoliths. The literatures have reports of up to 3.5 to 7 cm stones and are rare. The management includes removal of stone and re-channelizing the secretions in a functional gland or excision of gland in atrophied glands along with stone.

Keywords Sialolithiasis · Tonsilloliths · Obstructive sialadenitis

Introduction

One of the most common etiologies for obstructive sialadenitis is sialolithiasis. More than 50 % with an estimated 12 in 1,000 adult population being affected, with a slight male predominance [1]. 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. Sialolithiasis mainly occurs in third to sixth decade. Stone are also found in the tonsillar crypts (tonsilloliths) have been reported in 27 cases of English literature from 1920 to 2003 measuring 3–4 cm [2, 3]. Location in salivary gland may vary from parenchyma, and excretory duct.

Sialoliths are usually 5–10 mm in size, and the stones more than 10 mm are termed sialoliths of unusual size or a giant sialolith [4, 5]. Here we report two cases of chronic submandibular sialoliths of unusual size in a young and old patient and their management.

Case 1

A 10 year old boy reported with recurrent right submandibular swelling with pain of 8 month duration. Characteristic increase in swelling associated with pain and discomfort during meals and gradual regression. Occasional salty discharge intra orally associated with malaise and fever which subsided with antibiotics and analgesics. On examination, a diffuse left submandibular swelling measuring about 3 × 3 cm, warm and tender on palpation. Intra oral (Fig. 1) examination did not reveal any odontogenic cause. A hard mass in the right floor of mouth was palpated with painful discharge of saliva from the Wharton's duct. An occlusal view (Fig. 2) of mandible radiograph revealed radiopaque mass confirming the presence of salivary calculi. The salivary stone measuring 20 mm (Fig. 3) and weighing 5.2 gm was removed intra orally after the acute symptoms subsided with antibiotics. Patient is presently symptom free after 6-months post operatively.

Case 2

A 55 year old male (Fig. 4) was referred for the evaluation of asymptomatic swelling below the left lower border of mandible of 6 years duration. Clinical examination revealed a submandibular swelling which was firm in consistency measuring about 2 × 3 cm, non-tender and

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Fig. 1 Pus discharging from right duct

Fig. 2 Occlusal view showing oval radiopaque mass

Fig. 3 Post excision of stone (20 mm × 6 mm)

mobile. A bimanual palpation revealed a 1–2 cm hard mass along the left floor of mouth distal to canine region. The opening of Wharton's duct was identified and on gentle palpation caused mild exudation of purulent fluid. Occlusal radiograph (Fig. 5), revealed an oval shaped radiopaque

Fig. 4 Swelling in the *left* floor of mouth

Fig. 5 Occlusal view showing radiopaque mass

Fig. 6 Post excision of stone (22 mm × 8 mm)

mass in the floor of the mouth confirming the diagnosis of Sialolith. The stone (Fig. 6) measuring 22 mm in length and 8 mm diameter was removed surgically which weighed about 5.6 gm and left the submandibular gland untouched as patient refused for its excision.

Discussion

The salivary calculi develop as a result of deposition of mineral salts around a nidus of bacteria, mucus, or desquamated cells. Salivary stagnation, increased alkalinity of the saliva, infection or inflammation of the salivary duct or gland, and physical trauma to the salivary duct or gland are predisposing factors in calculus formation [6]. These are commonly seen in cases of tobacco smokers and patients on medications (e.g. diuretics) which are known to reduce secretions. Smoking causes a reduction in the antimicrobial potential of saliva; this could lead to microbes within the ductal system that may provide the substrate for salivary stone formation. However, there are no published studies on prevalence of tobacco smoking in a population having sialoliths [7].

The incidence of Sialolith is less in parotid due to reduced salivary viscosity, higher protein levels and downward course of stensen's duct. The obstructions in the parotid gland system rarely calcifies and are actually mucous plugs, additionally the small sized calculi are 20–30 % radiolucent, therefore not routinely detected on conventional radiographs [8]. Stones are believed to be more common in Submandibular duct system and the reasons 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 [6]. The sialoliths are mainly made up of calcium and phosphate with smaller quantities of ammonia, potassium and magnesium. The parotid stones are 49 % inorganic and 51 % organic material whereas the submandibular stone consist of 82 % inorganic and 18 % organic material [9].

The reason how these stones grow to such unusual sizes depends on the response of the duct. The increasing size of stone causes obstruction of salivary secretion leading to swelling, pain and infection. If the duct dilates allowing persistent but reduced salivary flow, the gland remains asymptomatic for long periods and in time sialoliths become large. When the stone grows beyond the ductal dilatation, a sialo-oral fistula may form and expose the stone in the oral cavity. This further facilitates the gland to function nearly normal and hence, enlargement of stone continues [10]. In geriatric age group, consumption of medication for various reasons reduces the secretory activity of glands, altering electrolyte concentration and structural deterioration of cell membrane of salivary glands contributing for the higher incidence of giant sialoliths [11].

Radiopacity is not a feature in 40 % of parotid and 20 % of Submandibular stones; in such cases sialography, sialoendoscopy, ultrasonography, radionuclide imaging,

computed tomography, and magnetic resonance imaging may be required to locate them. The occlusal radiograph is the most reliable method of viewing the submandibular sialolith. At least two views of conventional radiographs are mandatory to avoid missing the stone in the posterior region and at times multiple stones may be portrayed as single stones, one on each radiographic view. Computed tomography (CT) and magnetic resonance imaging (MRI) provide excellent soft tissue details but are not economical [12]. During the past 10 years, with the rapid development in endoscopic techniques and the introduction of sialo-endoscopy, diagnosing and exploring the submandibular gland directly has improved, and also permits minimally invasive surgical treatment to deal with the obstruction [13].

The common sites for sialoliths include the anterior two-thirds of the duct, the posterior third at the distal border of the mylohyoid muscle and within the gland itself. They are frequently seen as a yellow palpable swelling, tender when inflamed or infected, which can be felt on bimanual palpation. First the stone is localized, a deep suture is placed behind stone to avoid slipping back towards gland, make an incision parallel to the duct in the floor of the mouth and the stone removed. When large stones are removed, the incision is partially closed with drain, which creates new orifice after healing. In both the cases sialodochoplasty was performed. A stimulant for the salivary glands for salivary flow is important to keep the new opening patent. Stones in the posterior part of the duct are more difficult to remove intra orally and hence, the gland along with stone is excised through extra oral approach. The alternative methods available and tried are lithotripsy using a piezoelectric lithotripter and laser sialolithectomy, using CO₂ lasers [14, 15].

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