

Giant sialolith in submandibular salivary gland

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Introduction

Over 50% of major salivary gland disorders are caused by calcified masses called sialoliths¹. The majority of these calculi (80-90%) occur in the submandibular salivary gland, 5-10% in the parotid and 1-2% in the sublingual or minor salivary glands¹. Sialoliths typically measure 0.6-1 cm in size and are found within the excretory ductal system. Calculi over 1.5 cm in size, or with a dry weight more than 1g are defined as Giant sialoliths. Exceeding 3.5 cm is very rare and accounts for 7.6%². Here we report an extremely rare case of a giant sialolith measuring 3.5cm x 1.9cm and weighing 2.3g, contained in the parenchyma of the submandibular gland.

Case Presentation

A 39-years-old male presented to the oral and maxillofacial surgical unit complaining of a large swelling under the mandible on the right side of the neck, limiting mouth opening and swallowing along with altered speech and fever for 3 days. For the past 10-12 years, he had been suffering from a gradually increasing neck lump, but neglect prevented him from seeking proper medical investigations.

On admission, the patient had a firm-hard, 6cm x 5cm in size, tender swelling on the right submandibular region. (*Figure: 1*) It seemed likely that the lesion was associated with the right submandibular gland based on bimanual palpation. Multiple septic foci were seen intra-orally in all four quadrants of the oral cavity. The right side floor of the mouth was raised, shifting the tongue to the opposite side with pus draining from the right submandibular duct opening. He had no breathing difficulty.

Right lateral oblique mandibular radiograph revealed a large radio-opaque, oval-shaped mass with well-demarcated corrugated margins (*Figure: 1*), giving the clinical impression of a sialolith within the right submandibular gland. The ultrasound scan showed a large echogenic mass with dense shadowing and compressed glandular parenchyma confirming the calculi was within the gland.

Initial treatment of acute infection and inflammation included IV antibiotics and IV dexamethasone, preventing the disease from progressing to Ludwig angina. Subsequently, the sialolith and submandibular gland were surgically removed using the Risdon extra oral submandibular approach (*Figure: 2*). Multiple adhesions of the scarred submandibular gland



Figure 1. :- Extra oral view of the patient with a diffused, tender swelling on right side submandibular region measuring 6cm x 5cm in size and right lateral oblique radiograph showing large radio-opaque, oval shape mass with well demarcated corrugated margins

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tissues to surrounding vital structures of the neck were noted and carefully separated during the procedure. Lingual, Hypoglossal and Marginal mandibular branch of the Facial nerves were carefully identified and preserved. The main excretory duct was ligated to prevent retrograde intra-oral infections. The sialolith was oval, yellowish to tan-brown with a rough corrugated surface, measuring 3.5cm x 1.9cm in dimension and 2.3g in dry weight (*Figure: 2*). In addition, all un-restorable teeth and intra-oral septic foci were eliminated to improve oral hygiene. No postoperative complications were noted and he was advised to get a partial denture to replace missing teeth.

Discussion

The majority of sialoliths (70% - 90%) form in the submandibular gland ductal system due to the wider and longer tortuous nature of Wharton's duct compared to the Stensen's duct of the Parotid, which facilitates stasis of saliva due to the effect of the gravity. Further, the submandibular secretion is predominantly alkaline and viscous with more calcium and phosphate compared to entirely serous parotid secretions^{1,3}. Ninety-five percent of giant sialoliths are found in the submandibular gland, commonly within the ductal system and hardly within the glandular parenchyma^{1,3}. But in this case, the giant sialolith was within the glandular parenchyma which was an extremely rare presentation.

The annual incidence of sialolithiasis is 1.2%, with a 2:1 male predominance. Even though it can occur at any age, the middle age group of the 3rd to 6th decades is usually affected, and it is rare in children². In this case, a 39-year-old male patient, also fits the same demographic.

Several factors predispose to the initiation of calculi, including infection, inflammation, salivary stagnation, physical trauma, foreign bodies and desquamated epithelial cells. Subsequent salivary stagnation due to obstruction of the excretory pathway and precipitation of mineral salt facilitates

the gradual progression of the sialolith⁴. Predisposing factors in this case were frequent infections and inflammations of the oral cavity caused by multiple carious dental roots.

The transformation of the average 1 cm sialolith into a giant depends mainly on the secretory duct. If the secretory duct adjacent to the sialolith dilates, it might remain asymptomatic for a longer period and eventually lead to the manifestation of a giant sialolith⁴.

Imaging techniques are the fundamental investigation tools in the diagnosis of sialoliths. The lower standard occlusal radiograph is the commonest to view submandibular ductal sialoliths^{1, 3}. However, 40% of parotid and 20% of submandibular stones are radiolucent⁵. Conversely, Giant sialoliths are mostly radio-opaque, because their lithogenesis is long enough for calcification to be completed. Panoramic radiograph and lateral oblique view of mandible also used in the diagnosis of sialoliths⁵. We used a lateral oblique mandibular radiograph considering the size and the position of the swelling in this case and the ultrasound scan of the neck confirmed the calcified mass was within the glandular parenchyma.

Salivary gland calculi are treated generally based on the size and location of the sialolith^{1, 2}. It is possible to treat small sialoliths without surgery by increasing hydration, increasing salivary flow, and encouraging local massage to help flush them out. In some instances bimanual manipulation following surgical widening of the submandibular duct opening, can allow small stones near the ductal orifice to be milked out. Surgical removal of larger ductal stones is performed using intra-oral sialodochotomy or sialodochoplasty. Sialo-endoscopy and basket retrieval are used for ductal calculi less than 1cm with no surrounding adhesions. Submandibular gland removal is specified when there is a stone within the glandular parenchyma or at the proximal vertical portion of Wharton's duct^{1, 2}. However, for giant calculi such as in this case, Risdon submandibular approach is recommended for better access and safety of the surrounding vital structures.



Figure 1. :- intra-operative view of surgical removal of the lesion and the giant sialolith measuring 3.5cm x 1.9cm

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Learning Points:

- Giant sialoliths within the submandibular glandular parenchyma are extremely rare.
- Risdon's surgical approach to the submandibular region needs to broaden for better surgical access and to preserve the adjacent vital structures.
- Ligation of the submandibular duct is essential to minimize ascending infections from the oral cavity.