Short Communication

Unusually large sialolith of submandibular duct: A case report

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ABSTRACT

Background: Sialolithiasis is a common ailment of major salivary glands. Sialoliths are usually less than 1 cm in diameter and frequently found in the submandibular gland and its duct (Wharton's duct). A sialolith is considered giant if it is greater than 1.5cm in diameter and almost exclusively develop in the Wharton's duct.

Methods: Literature review was conducted using search engines such as PubMed and Google Web Browser looking for key terms such as "salivary stone", "sialolith" and "Submandibular duct". A 17- year- old female with recurrent swelling and xerostomia underwent a diagnostic workup using occlusal radiography to localize a sialolith in the terminal portion of the submandibular duct. The management involved an intraoral surgical excision under local anesthesia to remove the 17 × 10 mm calcification, followed by ductal irrigation to successfully restore salivary function.

Results: A total of 12 research articles were found relevant to our topic after analysis of the initial pool of research papers. We report a case of a large sialolith in the course of submandibular gland duct of a 17-year-old female who attended our clinic complaining of recurring swelling and pain in the left Wharton's duct opening area. The patient also complained of dry mouth. Occlusal radiography confirmed a sialolith in the terminal part of the submandibular duct. Surgical removal of a brownish sialolith measuring 17 × 10 mm in size was undertaken under local anesthesia intraorally.

Conclusion : The management of giant sialoliths can be achieved via a minimally invasive surgical procedure and subsequently normal salivary flow was established and pain during meals disappeared.

INTRODUCTION

In sialolithiasis, obstruction of flow of saliva, causes pain, infection and swelling (obstructive sialadenitis) of the affected salivary gland. Its incidence is relatively common, and it approximately affects 1.2% of the adult population. Sialolithiasis predominantly affects the submandibular gland of middle-aged men. The occurrence in the submandibular salivary gland accounts to 80-95%of all cases and the male to female ration is 2:1. Sialoliths are usually found in the course of the excretory duct and is rarely seen in the parenchyma of the gland [1, 2]. Although the incidence of sialolithiasis is relatively common, the incidence of sialoliths measuring more than 1.5 cm in diameter (giant sialoliths) is considered rare. Accordingly, very few reports of such cases are found in the medical literature. While reports of giant sialoliths perforating floor of the mouth is extremely rare [2-4].

This case report is of a 17-year-old female with obstructive sialadenitis secondary to a large calculi. We are describing the clinical features and diagnosis, followed by the surgical intervention done to reestablish the salivary flow.

METHODS

Literature review was conducted using search engines such as PubMed and Google Web Browser looking for key terms such as “salivary stone”, “sialolith” and “Submandibular duct”. A total of 12 research articles were found relevant to our topic after analysis of the initial pool of research papers.

The clinical portion of the study involved the diagnostic assessment of a 17-year-old female patient presenting with classic symptoms of salivary duct obstruction. A detailed medical history was recorded, focusing on the duration of recurring swelling, pain at the Wharton’s duct opening, and the presence of dry mouth. The primary diagnostic tool employed was an occlusal radiograph, which was selected for its high sensitivity in detecting calcified masses within the floor of the mouth. This imaging allowed for the precise localization of the sialolith within the terminal portion of the submandibular duct and the measurement of its dimensions prior to surgical intervention.

The surgical management was performed intraorally under local anesthesia to ensure patient comfort and localized control. Following the administration of the anesthetic, a careful incision was made directly over the palpable mass in the left Wharton’s duct. The sialolith was then meticulously dissected from the surrounding ductal tissue and removed in its entirety. Post-extraction, the stone was measured and its physical characteristics, such as color and texture, were documented. The duct was then irrigated to ensure patency, and the patient was monitored for the restoration of normal salivary function.

RESULTS

We present a case of a 17-year-old female patient with complaint of a recurrent painful swelling in anterior floor of mouth region which was present for over 3 years. On intraoral examination, a hard, mobile and slightly tender nodule was palpable in the left Wharton’s duct opening area (Fig. 1). A lower occlusal radiograph showed a radiopaque mass with defined limits in the left anterior half of the floor of the mouth consistent with the diagnosis of sialolith (Fig. 2).

The extraction of the sialolith was done under local anesthesia via an incision directly over the stone (Fig. 3 and 4). The sialolith was measuring approximately about 17 × 10 mm in size and was brownish in color (Fig. 5). Following removal of sialolith the incision was closed and the patency of the duct orifice was confirmed (Fig. 6).

Figures

Fig 1: Unusually large sialolith

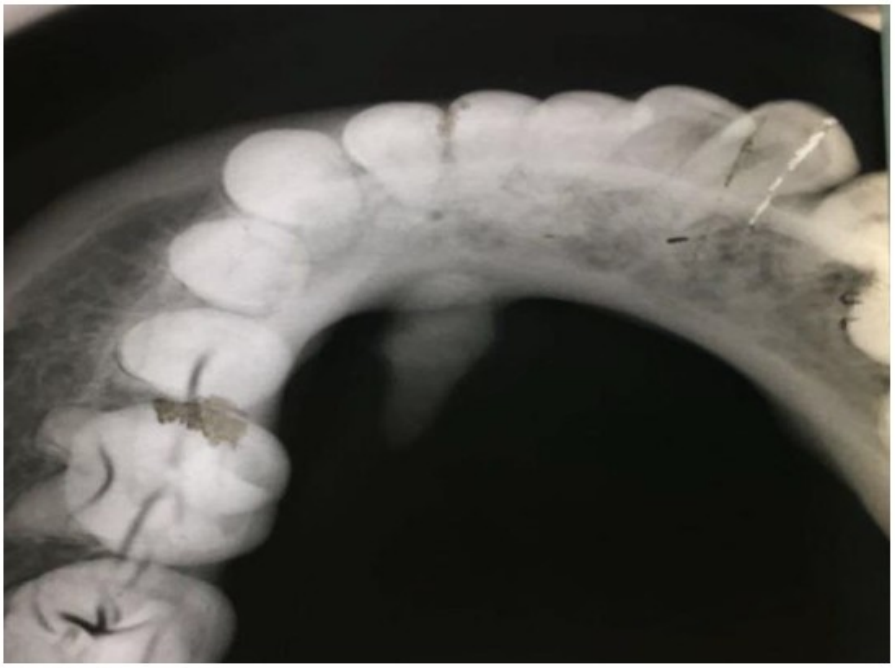

Fig 2: Occlusal radiograph showing presence of large sialolith present lingual to the mandibular incisors.

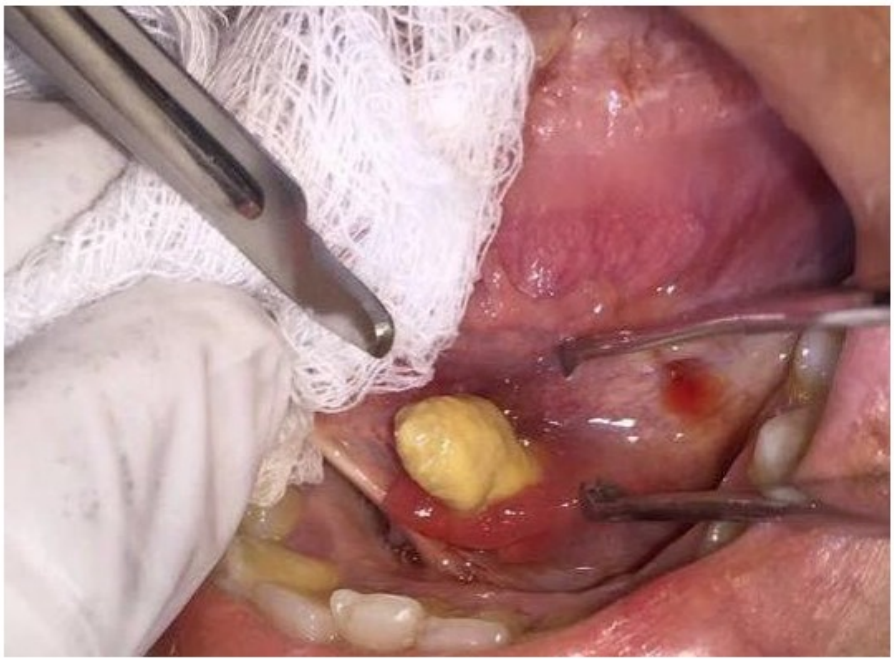

Fig 3: Removal of sialolith was done after small excision on the submandibular duct.

Fig 4: Complete sialolith after removal from the duct.

Fig 5: The sialolith is of around 17 mm in maximum diameter and is of irregular shape.

Fig 6: After removal of the sialolith the surgical site was sutured well.

DISCUSSION

The sizes of salivary calculi are variable ranging from small sand like particles, to large calculi formations. Salivary calculi usually are between 3.3 and 17.9 mm in size [4].

According to Lustmann et al [5], sialoliths measuring less than 1cm account for 78.8% of patients, while those measuring 1-1,5cm and more than 1.5cm account for 13.6% and 7.65% of patients, respectively [6]. The average growth rate of a salivary calculi is 1 to 1.5 mm annually [4,7].

Although the exact pathogenesis is not known, it is believed that the etiology of sialoliths includes [1, 2, 8]

 Deposition of minerals surrounding a “nidus” of bacteria, mucus, or desquamated

 Elevated calcium concentration and pH in saliva.

 Inflammation of the salivary gland or its duct secondary to infection or trauma.

Harrison et al [9] stated that the initial development of a sialolith is secondary to sialadenitis and is directly correlated to its duration. According to these authors, chronic sialadenitis and its associated edema would lead to constriction of the ductal system causing stagnation of secretory calcium rich material. This favors the formation of a calcified nidus from which a calculi would form and eventually grow in size [10].

The higher incidence of calculi formation in submandibular glands (80-90% of all cases of sialolithiasis) could be because [2, 7, 10]

 Higher pH (alkalinity)

 Higher concentration of calcium and

 Salivary flow occurs against gravity that might lead to saliva stagnation.

 Higher content of mucin in the submandibular gland secretions.

 The submandibular gland duct has a long and tortuous

All these factors are implicated in the higher rate of calculi formation in the submandibular gland. Sialolithiasis is frequently associated with recurring episodes of swelling and pain in the affected salivary gland. Stimulation of salivary glands, especially when eating, is associated with episodes of pain and swelling [2].

Most commonly used diagnostic radiology techniques to identify sialolithiasis are orthopantomogram and occlusal views. Small calculi occasionally have low mineral content and are radiolucent in contrast to large sialoliths which are mostly radiopaque and would be clearly represented on radiographs. Occlusal view was chosen in the present case for radiographic examination. Differential diagnosis of obstructive sialadenitis secondary to sialoliths may include calcified lymph node, ranula, bacterial or viral sialadenitis, phlebolith, impacted tooth, foreign body or myositis ossificans [11].

The rare previous reports on large sialoliths typically describe irreversible functional damage to the salivary duct leading to subsequent resection of the gland. The possibility of the conservative approach in the present case was due to the fact that the sialolith had already caused a dehiscence of the epithelium the following day after the initial diagnosis.

The main objective of management of giant sialoliths is the reestablishment of normal salivary flow. The management approaches for submandibular sialoliths are either transoral extraction of stone, sialendoscopy or gland excision. The location, size and number of stones dictate the appropriate treatment modality for management and treatment. Bimanual manipulation and milking of the salivary gland can sometimes remove small stones through the duct orifice. Removal of proximally positioned sialoliths can be feasible via small incisions in the oral cavity. Large stones which are not amenable for removal would necessitate excision of the whole submandibular gland. [1].

New advanced treatment options are suggested for management of sialolithiasis, such as intracorporeal and extracorporeal shockwave lithotripsy and sialolith fragmentation [1]. Shortcomings of these techniques is mainly due to the very high cost involved. Therefore, surgical removal is economically a valid option for many patients [11, 12].

Injury of the lingual nerve and Wharton's duct stenosis are the main significant complications that can arise from surgical approaches for the management of submandibular sialolithiasis [3]. This case report point to the feasibility of conservative therapeutic approaches to a large sialolith. No functional impairment remained after the therapy in this case.

AUTHOR CONTRIBUTIONS

Ghassan M Al-Iryani
Concept and Design, Manuscript drafting

Fareedi Mukram Ali
Manuscript drafting, Critical revision of manuscript

Osama Ibrahim Homedi
Literature review

Nada Ali Johaliy
Literature review

Amjad Mansour Khalawi
Literature review

Atheer Khaled Mohammed Geesi
Literature review

Elnour Ibrahim Elbeshir
Supervision, critical revision of manuscript, Patient management

Amal A Maghdi
Patient management

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Declaration of Generative AI and AI-Assisted Technologies

The authors used AI to improve language clarity and readability. No figures or images were generated or modified using AI tools.

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