



Giant Sialolith: Two cases of successful surgery

Bora Ozden, DDS, PhD¹
Vugar Gurbanov, DDS²
Ezgi Yüceer, DDS²
Dilara Kazan, DDS²
Levent Acar, DDS²

¹ Associate professor at Department of Oral and Maxillofacial Surgery, Ondokuz Mayıs University, Samsun, Turkey.

² Research assistant at Department of Oral and Maxillofacial Surgery, Ondokuz Mayıs University, Samsun, Turkey.

Correspondence:

Vugar Gurbanov, DDS,

Research assistant at Department of Oral and Maxillofacial Surgery, Ondokuz Mayıs University, Samsun, Turkey.
email: surgeryvugar@gmail.com
Phone: +90 506 154 31 65

Sialolithiasis or salivary gland duct calculi are the most common pathologies of the salivary glands. They are the most general cause of acute and chronic infections of the major salivary glands. Salivary stones larger than 15 mm are classified as giant sialoliths. Two case reports describe giant sialoliths of submandibular salivary gland ducts. Also, a new method is used in these cases. It can prevent obstruction of the salivary gland ducts after the surgical removal of the stones.

Keywords: salivary glands, salivary duct calculi, Wharton's duct

Introduction

Sialolithiasis is one of the most common diseases of the salivary glands. Its incidence is approximately 1.2% in adult population and men are affected more than women (2:1). [1, 2] Submandibular glands are effected 80% of the cases. [2, 3]

Sialoliths are always found in the distal portion of the duct or at the hilum of the gland and more rare in its parenchyma. [1]

Commonly, sialoliths' sizes are between 1 mm and 1 cm. They are rarely seen in a size more than 1.5 cm. Stones larger than 15 mm in any dimension or heavier than 1 gram have been classified as 'giant stones' or 'megaliths'. [4, 5] It could be hypothesized that it takes years to obtain a stone classified as a giant sialolith. The aim of this paper is to present two cases of an unusually sized sialoliths and their treatment methods.

Case Report

First patient was a 51-year-old woman who was referred to our clinic with complaint of a swelling on the left side of the floor of the mouth for more than 2 years. The patient's medical history, drug history, and general physical examination were all non-significant. During the intraoral examination, a large firm swelling was noted with no color changes of the surrounding mucosa. There was no history of pain or

aggravated swelling during meals.

Second patient was also a 51-year-old woman with history of epilepsy and chronic depression. During routine intraoral examination, diffuse swelling with normal overlying skin was detected on the left side of the floor of the mouth. The patient was unaware of the swelling. The solid mass was freely movable and there were no signs of pain, discomfort, ulceration, fistula, or infection. During the palpation of the left submandibular gland, the absence of salivary flow from the left Wharton's duct orifice was observed.

For both of the patients, no submandibular swelling was detected during extraoral examination. Occlusal and panoramic radiographies (OPG) and cone beam computed tomography (CBCT) scans were used for diagnosis. Radiographic examination showed a large radiopaque mass, round in shape and approximately 10.6×16.4×15 mm in size for the first case and 15×15.1×9.2 mm in size for the second case, in the left submandibular region (Fig. 1). CBCT scans confirmed similar findings (Fig. 2).

Sialolithectomy was performed with an intraoral approach using local anesthesia. Upward and medial pressure were applied to the submandibular area, and an intraoral incision was made directly over the sialolith to expose it (Fig. 3). A hemostat was used to expose the superior aspect of the stone. After mobilizing the sialolith sufficiently, the

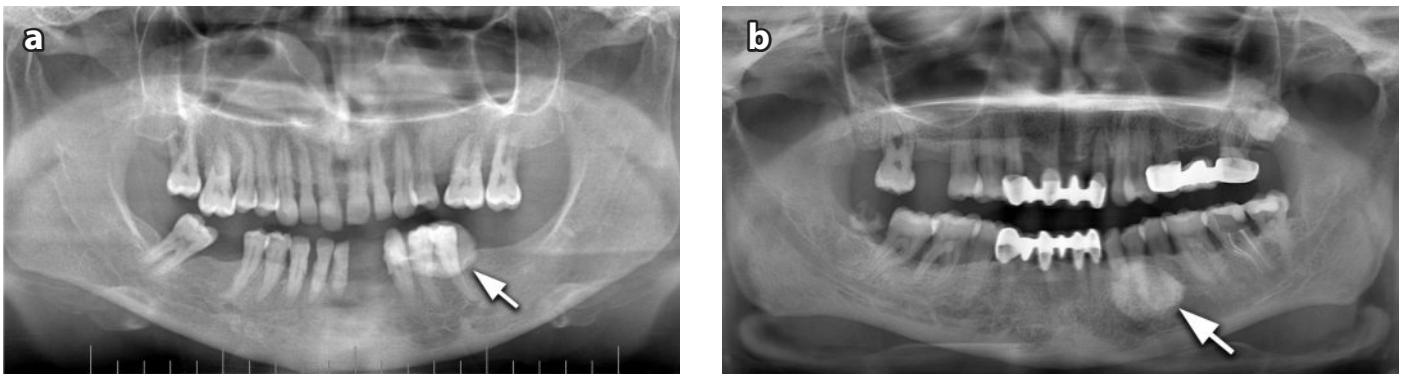


Figure 1.

In panoramic radiographies (OPG) of the first (a) and second (b) case there are shown radiopaque giant sialoliths (arrows).

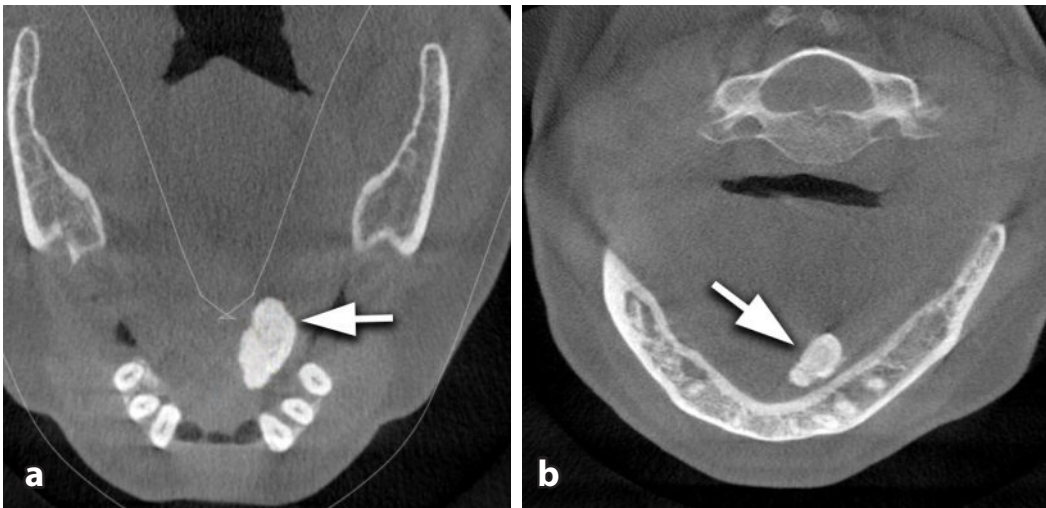


Figure 2.

Cone beam computed tomography (CBCT) scans of the first (a) and second (b) case. Sialoliths are shown by arrows.



Figure 3.

Intraoral incision over the sialolith.

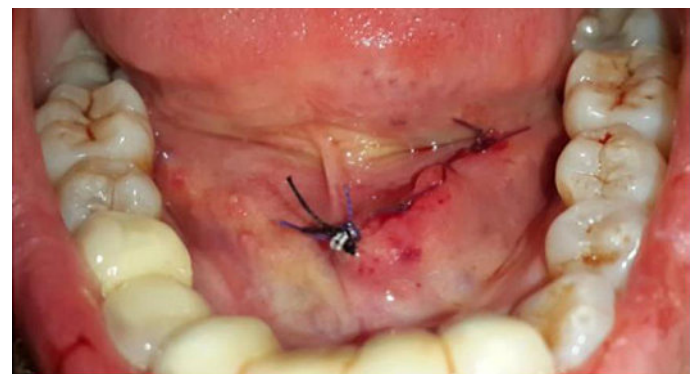


Figure 4.

The suture after removal of the sialolith and catheter placement.

stone was removed with finger pressure. The sialolith was taken out and a catheter was placed that is used for providing vascular access ordinarily, into the Wharton's duct to prevent duct obstruction (Fig. 4). The catheter was fixed with suture for 3 days. At the 1 year follow-up postoperatively, there was no swelling of the submandibular gland and salivary flow was uneventful.

Discussion

Sialoliths can arise in any salivary gland. Submandibular gland is the most affected one (80% to 95%) [3]. 5% to 20% of the cases are found in the parotid gland. The sublingual gland is uncommonly affected (1% to 2%). There are some characteristics of the submandibular gland that influence this incidence:

- 1) Saliva from the submandibular gland is more mucinous and alkaline than the other glands.
- 2) The Wharton duct is longer, wider and more circuitous than the Stensen duct.
- 3) Calcium and phosphate quantity in submandibular saliva are higher than the other glands.
- 4) Gravity acts against the salivary secretion of the submandibular gland. [2]

There are several theories for formation of the calculi and none of them explain exact mechanism. Salivary stones are supposed to occur as a result of deposition of calcium salts around an organic debris that include mucins, bacteria and desquamated epithelial cells. [2, 6] Physical trauma, infection and inflammation of the gland, stagnancy of saliva flow are the other predisposing factors [5]. The use of drugs can be an alternative predisposing factor. Drugs can reduce salivary flow, change electrolyte concentration, decrease glycoprotein synthesis and degrade the cell membranes of the salivary glands [7]. In our second case, it is thought that long-term use of antiepileptic and antidepressant drugs are the ones that caused salivary gland stone.

Giant sialoliths are easily detected on panoramic radiographs as an radioopaque mass nearby the submandibular fossa. Occlusal radiography is a better option to visualize the stone without superposition of the other anatomic structures. To maintain detailed information CBCT is a wise option. In this case, we detected the exact location of the stone using the CBCT. Other imaging techniques, include sialography and ultrasonography also can be used to diagnose sialoliths. Ultrasonography is the best method to differentiate intraglandular and extraglandular masses. Sialography is the recommended method for evaluating abnormalities of the ductal system. This technique is especially useful for the evaluation of inflammatory conditions that are associated with sialoliths. [8]

Salivary stones are classified as ductal or intraglandular. Submandibular sialoliths mostly occur in ducts (75% to 85%) [9]. The location of the stone is very important for management of the treatment. In most of the cases, surgical excision of the stone is usually adequate but for the intraglandular stones complete excision of the affected gland together with the stone(s) must be thought.

Management of sialoliths depends on the size and localization of the stone and duration of the symptoms. Removal of stones with intraoral approach is recommended whenever stones can be palpated intraorally. [10] The most important purpose of the intraoral approach is recovering the secretory function after sialolithectomy. In our cases, we used a stent placed into the orifice of the duct to prevent the obstruction. For the stent placement, the hypospadias silastic stent tubes, pediatric feeding tubes and epidural catheter were used in many cases. [11, 12] Many researchers reported different duration times for stent placement. [11] We used an intravenous cannula for 3 days. At the 1 year follow-up of the cases, there were no complication and it was seen that the ducts' orifices were open and there were no abnormalities of the secretory functions.

Newer treatment options including sialendoscopy, lithotripsy and laser fragmentation are effective alternatives to conventional surgery. [13]

Conclusion

Giant sialoliths represent a major challenge to oral surgeons in the choice of surgical approach to prevent excision of the gland and possibility of hypoesthesia, dry mouth, or salivary fistulae. The surgical technique for removal of sialoliths should be minimized to prevent gland morbidity. The purpose of this minimized, gland-preserving intraoral approach is restoring normal salivary flow. Salivary obstruction for long periods can cause fibrosis and atrophy of the affected gland. Giant sialoliths should be removed even when asymptomatic to prevent complications. We suggest that a catheter must be used to prevent obstruction of the salivary gland duct after the surgical removal of the stone intraorally. This method doesn't require any extra equipment and it is easy to apply.

References

1. Seifert G, Miehke A, Haubrich J, Chilla R. Diseases of the salivary glands. Georg. Thieme Inc. New York 1986.
2. Siddiqui SJ. Sialolithiasis: an unusually large submandibular salivary stone. British Dental Journal. 2002 Jul 27;193(2):89-91.
3. Walvekar RR, Bomeli SR, Carrau RL, Schaitkin B. Combined approach technique for the management of large salivary stones. The Laryngoscope. 2009 Jun 1;119(6):1125-9.
4. Raveenthiran V, Rao PH. Giant calculus in the submandibular salivary duct: report of the first prepubertal patient. Pediatric surgery international. 2004 Feb 1;20(2):163-4.
5. Bodner L. Giant salivary gland calculi: diagnostic imaging and surgical management. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2002 Sep 30;94(3):320-3.
6. Escudier M. Epidemiology and aetiology of salivary calculi. Controversies in the management of salivary gland disease. 2001 Nov 1;249-55.
7. Rauso R, Gherardini G, Biondi P, Tartaro G, Colella G. A case of a giant submandibular gland calculus perforating the floor of the mouth. ENT: Ear, Nose & Throat Journal. 2012 Jun 1;91(6).
8. Burket LW, Greenberg MS, Glick M, Ship JA. Burket's oral medicine. PMPH-USA; 2008. p. 191-223
9. Shetty BN, Sharma P. Unusual case of a projecting intraoral giant sialolith. Indian Journal of Surgery. 2010 Apr 1;72(2):155-7.
10. Rai M, Burman R. Giant submandibular sialolith of remarkable size in the comma area of Wharton's duct: a case report. Journal of Oral and Maxillofacial Surgery. 2009 Jun 30;67(6):1329-32.
11. Su CH, Lee KS, Tseng TM, Hung SH. Post-sialendoscopy ductoplasty by salivary duct stent placements. European Archives of Oto-Rhino-Laryngology. 2016 Jan 1;273(1):189-95.
12. Hiremath V, Patil AG, Aparna S. Surgical management of Stenson's duct injury using epidural catheter: A novel technique. Nigerian journal of clinical practice. 2013;16(2):266-8.
13. Sun YT, Lee KS, Hung SH, Su CH. Sialendoscopy with holmium: YAG laser treatment for multiple large sialolithiasis of the Wharton duct: A case report and literature review. Journal of Oral and Maxillofacial Surgery. 2014 Dec 31;72(12):2491-6.