



## Intraoral Removal of a Giant Submandibular Sialolith: A Case Report

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### Abstract

One of the most prevalent conditions affecting the salivary glands is sialolithiasis. Seldom have large submandibular sialoliths measuring more than 3 cm been documented in the literature. We provide a unique instance of a massive submandibular calculus and how it was managed using an intraoral combination approach, preventing the need of gland excision and reducing related comorbidities.

**Keywords:** Sialolithiasis; Submandibular Gland; Combined Approach

### Introduction

Formation or presence of stones or small concretions in salivary gland is known sialolithiasis. It is a common salivary gland disorder characterized by the obstruction of the salivary secretion, accounting for approximately one third of salivary gland disorders [1]. Salivary stone is classified as 'giant salivary stone' when the diameter is 15 mm or more in any direction or when the weight is 1 g or more [2].

Sialolithiasis usually occurs between the age of 30 and 60 years, and it is uncommon in children as only 3% of all sialolithiasis cases have been reported in the pediatric population [3]. Majority (80-95%) stones involves submandibular salivary gland or duct, parotid gland is less frequently involved - (4-10%), whereas minor salivary glands and sublingual gland are very rarely (1-7%) involved [4].

The exact etiology of salivary stones is not completely understood. It is considered that salivary stasis or decreased salivary flow contributes to the precipitation of calcium which leads to formation of the stone. Sialolithiasis can be asymptomatic or associated with swelling of the affected gland while chewing. Symptoms are usually recurrent and subsides dramatically post meal time. As a salivary stone doesn't occupy full circumference of the duct it remains asymptomatic commonly. Symptoms tend to occur when salivary stones expand and cause complete obstruction. In these circumstances (e.g., during meals), the gland can inflate with obstructed saliva, causing swelling and discomfort [5].

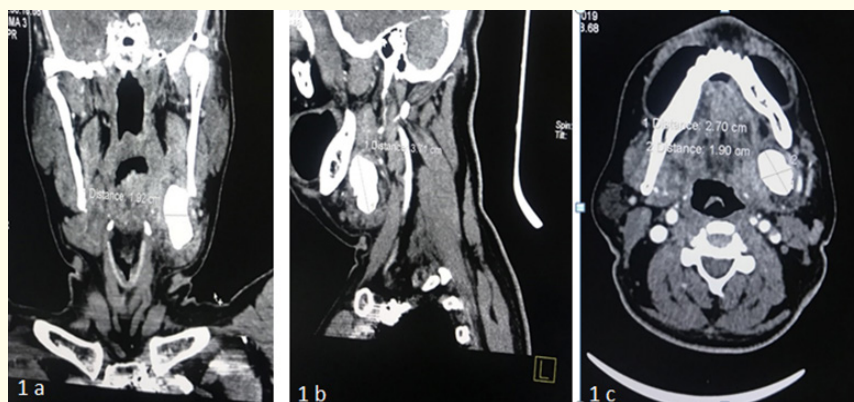
### Case Report

40-year-old male patient reported to our Otolaryngology outpatient department of a tertiary care center with a chief complaint of painful swelling below the tongue since 2 months. The swelling

was gradually increasing in size and has been present since past 1 year. It was asymptomatic initially and became painful before 2 months. He noticed that the swelling increased while chewing or during meal time and decreased shortly after. Patient took medications from the local doctor once but symptoms were recurrent. Patient had no other relevant symptoms or no significant comorbidity.

At time of presentation, neck examination revealed minimal swelling with tenderness on palpation in left submandibular re-

gion. Intraoral examination revealed a large (approximately 3\*2 cm), well defined swelling on the left side floor of the mouth. It was minimally tender, firm to hard and relatively mobile and confirmed by bimanual palpation. Overlying mucosa was normal in color with no purulent discharge. The diagnosis of a giant salivary calculus of the left Wharton's duct was further confirmed by contrast enhanced neck scan that showed a radiopaque oval sialolith of about (3.7\*2.7\*1.92 cm) located within the left Wharton's duct (Figure 1a, 1b, 1c).



**Figure 1a,1b and 1c:** Coronal, sagittal, axial view CECT neck showing radiopaque submandibular sialolith.

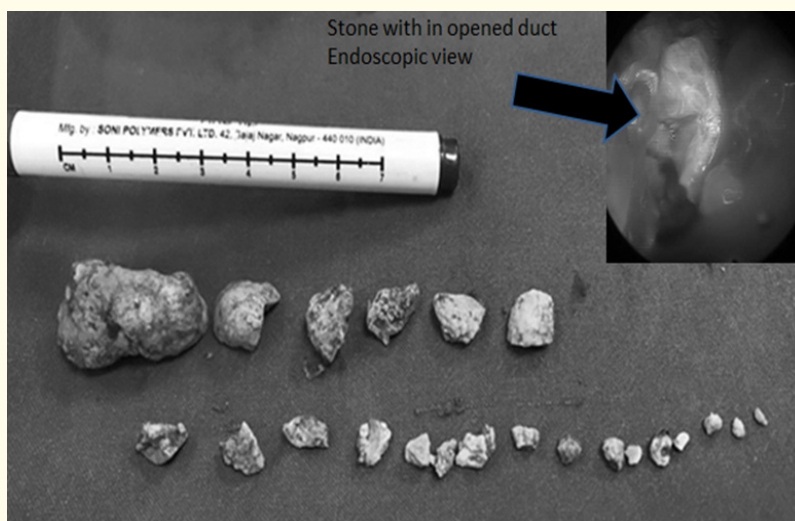
Antibiotics and N.S.A.I.D. (Amoxicillin 625mg TDS and Ibuprofen 600mg BD) were prescribed along with hot fomentation for 1 week to treat acute infection. Following which, standard preoperative work-up was performed. Sialolith removal by combined approach under general anesthesia was planned. During surgical procedure, Wharton's duct opening identified using standard ENT microscope and dilated with serial dilators. Sialoendoscopy was done with all in one semi rigid (1.3 mm) Karl storz sialoendoscope. Stone was located unusually close to the glandular opening of the duct. Some loose fragments were removed in pieces with micro burr and dormia basket. Stone was hard and impacted within the duct. An incision over the duct was made with a sickle knife after locating the stone in the floor of mouth with guidance of bimanual palpation. Great care was taken not to injure either lingual or hypoglossal nerve. Even with appropriate floor of mouth incision stone was difficult to remove due to impaction, limited field of vision, lack of illumination to operative site and difficult area for manipulation.

Sialoendoscopy was repeated to locate and dislodge stone from the widened duct using various instruments like microdrill and all the fragments were delivered in- toto by combined approach successfully. The operative site was irrigated along with steroid wash at the end. Size of the stone removed was 3.7\*1.9 cm and weight was 10 grams. A standard ductal stent kept in situ for 5 days and after removal of which Free Flow of saliva was achieved.

## Discussion

Salivary stones are very common pathology affecting the major salivary glands. Submandibular gland is more commonly affected than parotid or any other salivary glands because of the longer and wider duct, salivary flow against gravity, alkaline pH and higher content of mucin, proteins, calcium, and phosphate [6].

Sialolith formation can occur in two phases, namely, the central core and a layered periphery phase. The first central core phase



**Figure 2:** Giant Sialolith in pieces removed from left submandibular duct, Inset: endoscopic assisted image of stone.

is formed by the precipitation of salts, which are bound by certain organic substances such as various carbohydrates and amino acids. The second layered periphery phase consists of layered deposition of organic and inorganic material [7].

The ability of a calculus to become giant depends mainly on the reaction of the affected duct. If the duct adjacent to the sialolith is able to dilate allowing nearly normal salivary flow, it might remain asymptomatic for a long period; thus eventually creating a giant calculus [8]. Weight of the giant sialolith was not very well communicated in previously reported cases, however, according to the reported data, they can be very light specimens (4.2 g) or can attain a heavy weight (33 g) [9]. This weighed about 10 g in our instance.

The diagnosis can be made by history, physical examination and using radiological investigations. Ultrasonography, Orthopantomogram X-ray, Sialography or CT scan are some of the most popular modalities.

Objectives of the treatment of salivary stones would be complete removal of the stone/stones and to achieve free flow of saliva. Various treatment modalities can be applied according to the size and location of the stone apart from conventional gland removal method. It can be conservative like gland massage and sialagogues or minimally invasive techniques like sialoendoscopy, sialodochotomy, shock-wave lithotripsy, interventional radiology and laser fragmentation.

In our case the giant submandibular stone was removed completely with combined approach which combines sialoendoscopy with sialodochotomy. The combined procedure allows complete removal of large or impacted sialoliths without the need for removal of the entire gland with acceptable complication rates [10].

Giant submandibular gland stones are rare and therefore pose both diagnostic and therapeutic challenge for the clinician. Goal of the treatment should be removal of the sialolith in the least invasive way possible.

#### Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

#### Conflicts of Interest

None.

## Bibliography

1. Williams M F. "Sialolithiasis". *Otolaryngologic Clinics of North America* 32 (1999): 819-834.
2. Gupta A., *et al.* "Giant sialoliths of sub mandibular duct: report of two cases with unusual shape". *Contemporary Clinical Dentistry* 4 (2013): 78-80.
3. Nahalieli o., *et al.* "Pediatric sialolithiasis". *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology* 90 (2000): 709-712.
4. Lustman J., *et al.* "Sialolithiasis: a survey on 245 patients and review of the literature". *International Journal of Oral and Maxillofacial Surgery* 19 (1990): 135-138.
5. Zhang L., *et al.* "Long-term outcome after intraoral removal of large submandibular gland calculi". *Laryngoscope* 120.5 (2010): 964-966.
6. Rai M and 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* 67 (2009): 1329-1332.
7. Babu L and Jain MK. "Giant submandibular sialolith. A case report and review of literature". *International Journal of Head and Neck Surgery* 2 (2001): 154-157.
8. Hubar JS., *et al.* "Megalith". *Oral Surgery, Oral Medicine, Oral Pathology* 70.2 (1990): 245.
9. Bhovi TV., *et al.* "Giant submandibular sialolith in an old female patient: A case report and review of literature". *Journal of Indian Academy of Oral Medicine and Radiology* 28 (2016): 437-440.
10. Walvekar Rohan R., *et al.* "Combined approached technique for management of large salivary stones". *Laryngoscope* 119 (2009): 1125-1129.