A Submandibular Stone of 3 cm Length Obscuring Duct: A Case Report

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Abstract

The condition known as Sialolithiasis describes the development of calculi, or stones, inside the salivary glands or their ducts. The size of stones can range from tiny flecks to bigger aggregates that might obstruct blood flow and lead to edema, discomfort, and infection. A 33-year-old man who had a submandibular sialolith is the subject of this case report. An intraoral technique was used to remove the sialolith, and there were no difficulties after the procedure.

Keywords

Parotid gland, salivary duct, salivary glands, Sialolith, Sialolithiasis, Submandibular duct, Submandibular gland.

Consent

Written informed consent was obtained from the patient to publish this report.

Introduction

Salivary gland stones, or sialolithiasis, is a frequent disorder marked by the development of calculi within the salivary glands or their ducts and are the most common disease of the salivary glands in middle-aged patients[1]. These calcified deposits may stop saliva from flowing normally, causing discomfort, edema, and recurring infections. Sialolithiasis frequently affects the major salivary glands, including the submandibular, parotid, and sublingual glands.

1 to 2 percent of the population is thought to have salivary gland calculi. [2] Symptomatic sialolithiasis, on the other hand, is 0.45% common.[2]. The submandibular gland or Wharton's duct has the highest prevalence of them there (80% to 90%). [2].

Between 5% and 10% of sialoliths are found in the parotid gland/duct, and the remaining 0% to 5% are found in the sublingual or minor salivary glands.[2]

It is uncertain what causes calculi to form. However, it is evident that the relative standstill of calcium-rich saliva is where calculi develop [2]. It is known that salivary glands include tiny concretions termed microliths in the intraglandular ducts. These micro obstructions may be linked to the development of sialolith and chronic sialadenitis. [3]

A sialolith is an apatite structure that contains calcium phosphate and calcium carbonate condensations. Laminar layers of inorganic and organic materials build up around the amorphous nucleus; each sialolith has a unique composition. This debris may consist of foreign objects, bacterium colonies, exfoliated ductal epithelial cells, mucous plugs, and more.[4]

Case Presentation

We present an interesting case of a 33-year-old male patient who had a persistent and problematic condition affecting the left submandibular area. He had growing swelling in the area for three years, with occasional discharge of purulent material from the bottom of his mouth. Interestingly, the patient stated that the discomfort was getting worse over time and that the mass getting larger in size while eating. Mass was bimanually palpable with hard gritty felling on the floor of mouth on same side. Ultrasound showed an enlarged gland with no calculi in gland itself.

Therefore, it was planned to move forward with submandibular duct exploration in order to find and remove any blocking calculus due to the symptoms' prolonged length and disturbing nature. However, the situation turned out to be complicated since the patient's medical history revealed that he had previously worked as a driver in Qatar, where he had a long-standing habit of eating betel nuts that lasted for ten years. This behavior led to submucosal fibrosis and a limited opening of mouth. He only had two fingers mouth opening which made the intubation process prior the surgery, exceedingly difficult. **(Figure 1)** . Fortunately, effective intubation was accomplished with the use of video laryngoscopy, overcoming the challenge provided by the small oral aperture. Intraoral approach was carried out where a noticeable white structure that was compatible with a submandibular stone was discovered. After which incision was made along the duct and carefully removed using Babcock forceps **(Figure 2)** , which was distinctive in its own right since such a massive stone **(Figure 3).**

Notably, the stone was removed with just marsupialization of Wharton's duct preserving the submandibular gland's anatomical integrity. Marsupialization only done without use of cautery or suture to avoid stenosis or stricture along the duct that can lead to recurrence. Patient was discharged on next day morning. He was instructed to schedule follow-up sessions to assess his progress and make sure there were no problems.

It was also highly suggested that he stop eating betel nuts because doing so might considerably worsen the problem.

Figure 1: Patient with only two fingers mouth opening

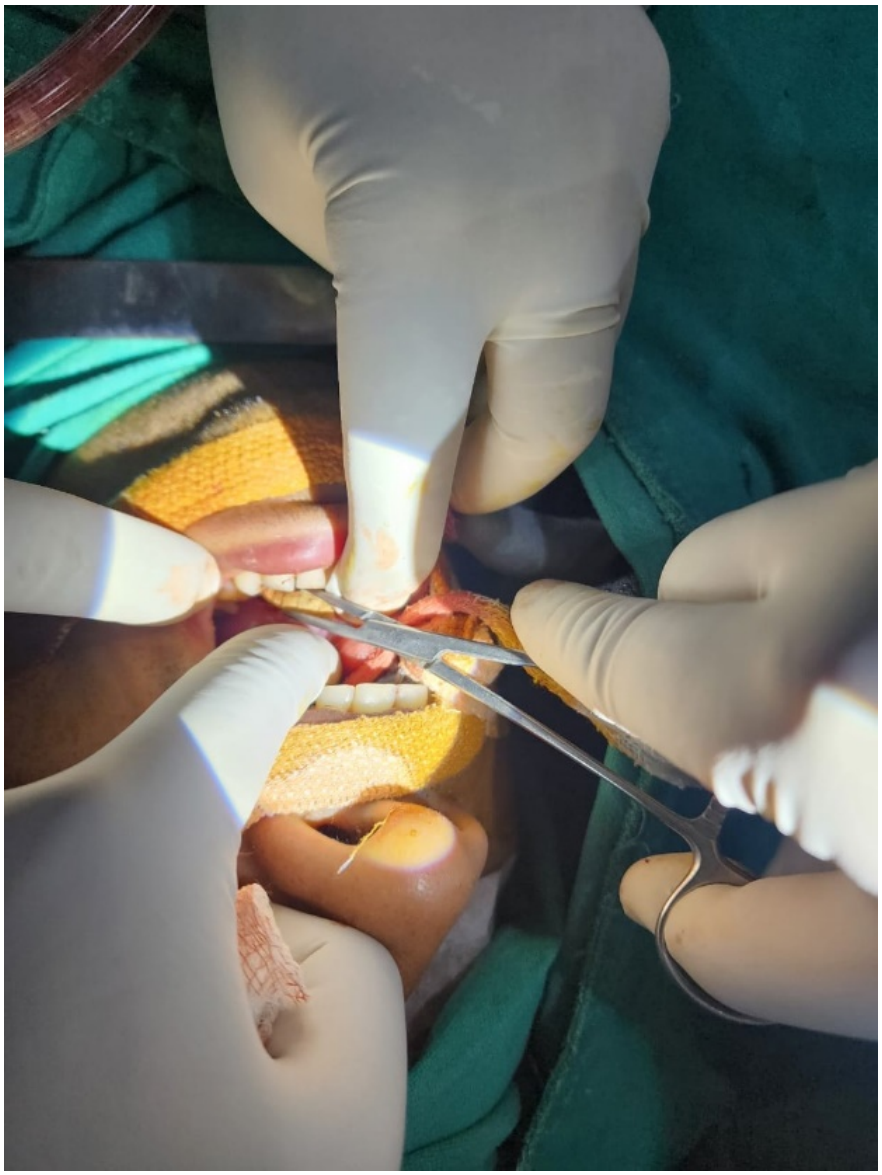

Figure 2: Intraoperative image showing delivery of the stone through an intraoral route.

Figure 3: Delivered specimen measuring 3 cm

Discussion

Due to its distinct anatomical features, the submandibular gland is believed to be more prone than other glands to the development of salivary stones.[5] Since the submandibular duct is longer and winding, there are more possibilities for saliva to become stagnant and calcify, which might result in the production of stones. Additionally, the submandibular gland releases saliva with a greater concentration of calcium and phosphate ions, which promotes the growth of stones.

Another risk factor for stone formation in the case under discussion is the patient's history of betel nut use. Chewing betel nuts increases salivation, which has been associated to an increased prevalence of sialolithiasis and can result in the deposition of calcified material within the salivary ducts. Additionally, the patient's habit caused submucosal fibrosis around the duct entrance, limiting mouth opening and creating difficulties for intubation and surgery.

Sialendoscopy has become a useful diagnostic and therapeutic technique for treating instances with restricted mouth opening or problematic access.[6] Sialendoscopy makes the salivary ductal system directly visible, making it easier to spot and remove stones precisely. Compared to conventional surgical methods, it provides the advantage of scarless operations and shorter hospital stays. Sialendoscopy, which reduces surgical invasiveness and preserves glandular function, would have been an option in this case to examine and remove the submandibular stone. A dormia basket can be used for extraction of tiny stones (4 mm).[7] Larger stones may necessitate additional procedures like extracorporeal shock wave lithotripsy (ESWL) or laser-assisted fragmentation.

In order to diagnose and treat submandibular sialolithiasis, it is essential to be aware of predisposing factors, such as anatomical differences and certain behaviors like eating betel nuts. Sialendoscopy is a sophisticated method that may be used in clinical practice to increase patient satisfaction, improve results, and lessen the risk of problems from more invasive procedures.

Conclusion

In conclusion, this case report demonstrates the effective intraoral excision of a 3 cm submandibular stone.

The patient's past use of betel nut chewing led to submucosal fibrosis, which presented difficulties during intubation and surgery. In addressing this instance, Sialendoscopy proved to be an invaluable diagnostic and therapeutic tool, enabling precision stone removal without glandular excision. The significance of patient education, follow-up appointments, and quitting betel nut use were underlined. This example emphasizes the value of customized therapies and cutting-edge methods in the thorough treatment of submandibular sialolithiasis.

Declaration

1. **Conflict of Interest**All authors declare that they have no conflicts of interest.
2. **Patient consent**Consent was obtained from the patient to publish this case report.
3. **Funding** None

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