Annals of Case Reports and Clinical Studies
Case Report (ISSN: 2834-5673)

Stone in the Flow: Surgical Management of a Submandibular Sialolith in a Young Adult

Godvine[1], Laxmi Shravya[1], Sarah Fatima[1*], Vandanapu Sai Prahan[2], Bommana Chenna Keshava Reddy[2], Vangala Sanjana[2], Yasaswi Inampudi[2]

[1]MDS, Panineeya Mahavidyalaya Institute of Dental Sciences and Research Centre

[2]BDS, Panineeya Mahavidyalaya Institute of Dental Sciences and Research Centre

Citation: Godvine, Laxmi Shravya, Sarah Fatima, Vandanapu Sai Prahan, Bommana Chenna Keshava Reddy, Vangala Sanjana, et al. Stone in the Flow: Surgical Management of a Submandibular Sialolith in a Young Adult. Ann Case Rep Clin Stud. 2025;4(12):1-14.

Received Date: 27 November 2025; **Accepted Date:** 30 November 2025; **Published Date:** 03 December 2025

***Corresponding author:** Dr. Sarah Fatima, MDS, Panineeya Mahavidyalaya Institute of Dental Sciences and Research Centre

ABSTRACT

Sialolithiasis is the most common non-neoplastic condition affecting the salivary glands, with the submandibular gland being particularly susceptible due to its anatomical structure and the nature of its secretions. This report presents the case of a 26-year-old male who experienced intermittent pain and swelling in the right submandibular region, especially during meals. Clinical examination and radiographic imaging confirmed the presence of a solitary sialolith obstructing Wharton's duct. The stone was surgically removed through an intraoral approach under local anaesthesia, and the site was closed with resorbable sutures. The patient recovered well postoperatively, with complete resolution of symptoms and no signs of recurrence. This case highlights the importance of early diagnosis and prompt surgical management in ensuring effective treatment and gland preservation in young adults presenting with symptomatic submandibular sialolithiasis.

Keywords: Sialolithiasis, Submandibular gland, Wharton's duct, Sialolith, Salivary gland stone, Surgical excision

INTRODUCTION

Sialolithiasis is a relatively common condition encountered in clinical practice, representing the most frequent non-neoplastic disorder of the salivary glands. It is characterized by the formation of calcified deposits—known as sialoliths or salivary stones—within the ductal system or parenchyma of the salivary glands. Among the major salivary glands, the submandibular gland is most commonly affected, accounting for approximately 80–90% of all cases [1,2]. This predilection is largely attributed to the gland's anatomical and physiological features: Wharton's duct is long and tortuous, and the gland produces a more mucinous, alkaline secretion that favours mineral precipitation and stagnation [2].

Clinically, patients often present with intermittent swelling and discomfort in the affected region, particularly during meals—a phenomenon known as "mealtime syndrome"—as salivary flow increases and is obstructed by the stone [3]. In some cases, the swelling may become persistent or painful, especially if secondary infection or ductal dilation occurs. While smaller, anteriorly located sialoliths may pass spontaneously or be managed conservatively with hydration, sialagogues, or minimally invasive techniques like sialendoscopy, larger or more posteriorly situated stones often require surgical intervention [4,5].

Advancements in diagnostic imaging have significantly improved the detection and localization of sialoliths. Conventional radiographs remain useful for identifying radiopaque stones, but newer modalities such as ultrasonography and cone-beam computed tomography (CBCT) offer enhanced visualization, especially for radiolucent or deeply embedded calculi [6,7]. Sialendoscopy, both diagnostic and therapeutic, has emerged as a valuable tool in selected cases, allowing direct visualization and retrieval of stones with minimal tissue disruption [8].

In this report, we describe the case of a 26-year-old male who presented with symptomatic sialolithiasis of the right submandibular gland. The diagnosis was confirmed through clinical and radiographic evaluation, and the stone was successfully removed via an intraoral surgical approach. This case highlights the importance of individualized treatment planning, the role of imaging in diagnosis, and the effectiveness of surgical excision in managing obstructive sialolithiasis while preserving gland function.

Here's a detailed and humanized version of your case report, written in paragraph form and suitable for publication. It includes clinical narrative, imaging references (occlusal, intraoral, extraoral), and surgical details, assuming that corresponding images are available for inclusion in the final manuscript:

CASE REPORT

A 26-year-old male reported to the outpatient department with a chief complaint of intermittent pain and swelling in the right submandibular region for the past three weeks. The discomfort was particularly noticeable during meals, suggesting a classic presentation of obstructive salivary gland pathology. The patient denied any history of fever, pus discharge, or systemic symptoms. His medical history was non-contributory.

On extraoral examination, a mild, diffuse swelling was observed in the right submandibular region, measuring approximately 2.5 × 2 cm.

The overlying skin appeared normal, with no signs of erythema or warmth.

On palpation, the swelling was firm, tender, and non-fluctuant, with no evidence of lymphadenopathy. Intraoral examination revealed a palpable, firm mass along the course of Wharton's duct on the right side of the floor of the mouth. The ductal orifice appeared slightly erythematous, and salivary flow was reduced upon milking the gland.

A mandibular occlusal radiograph was obtained, which revealed a well-defined, elongated radiopaque mass in the region of the right Wharton's duct, consistent with a sialolith **(Figure 1)**.

The stones appeared to be located anterior to the mylohyoid bend, making it amenable to intraoral removal. Preoperative intraoral and extraoral photographs were taken to document the clinical presentation **(Figure 2)**.

Figure 1

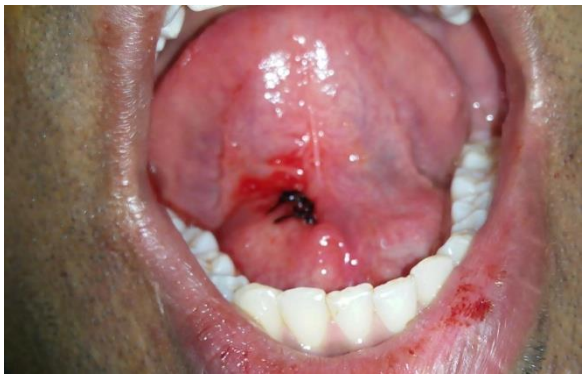

Figure 2

After obtaining informed consent, the patient was scheduled for surgical removal of the sialoliths under local anaesthesia. The floor of the mouth was anesthetized using 2% lignocaine with 1:80,000 adrenaline. A longitudinal incision was made directly over the palpable ductal mass. Blunt dissection was carried out to expose the duct, and a single, irregularly shaped sialolith measuring approximately 14 mm × 9 mm × 6 mm was carefully retrieved **(Figure 3)**. The ductal walls were inspected for any residual calculi or granulation tissue and were found to be intact. The ductal margins were approximated, and the mucosa was closed using 3-0 resorbable sutures **(Figure 4)**.

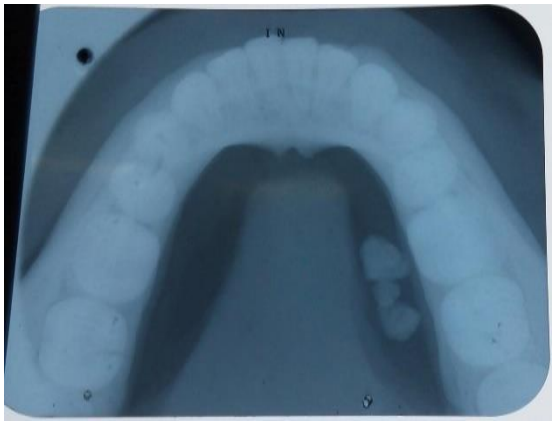

Figure 3

Figure 4

Postoperative instructions included maintenance of oral hygiene, warm saline rinses, and a soft diet. The patient was prescribed a short course of antibiotics and analgesics. Follow-up visits were scheduled at one week, one month, and three months postoperatively. Healing was uneventful, with complete resolution of symptoms and no signs of recurrence. Postoperative intraoral and extraoral photographs confirmed the absence of swelling and satisfactory healing of the surgical site

This case underscores the importance of correlating clinical findings with appropriate imaging to arrive at a timely diagnosis. The use of a mandibular occlusal radiograph proved sufficient in this case, avoiding the need for advanced imaging. The intraoral surgical approach allowed for effective removal of the calculus with minimal morbidity and excellent postoperative outcomes.

DISCUSSION

Submandibular sialolithiasis continues to be one of the most common causes of salivary gland obstruction, with a notable male predominance and peak incidence typically observed between the fourth and sixth decades of life [1,3]. However, younger adults, as in our case involving a 26-year-old male, may also present with symptomatic sialoliths, underscoring the need for clinical vigilance across age groups. The submandibular gland is particularly prone to stone formation due to several anatomical and physiological factors: Wharton's duct is long and tortuous, salivary flow must travel against gravity, and the gland secretes a more alkaline and mucin-rich saliva—all of which contribute to stasis and mineral deposition [2,4,12].

Clinically, patients often report pain and swelling in the floor of the mouth or submandibular region, especially during meals when salivary flow increases. This "mealtime syndrome" is a hallmark of ductal obstruction [3,13]. In our case, the patient's symptoms were classic, with intermittent swelling and discomfort exacerbated by eating.

Imaging plays a central role in confirming the diagnosis and planning treatment. While conventional radiographs such as mandibular occlusal views remain effective for detecting radiopaque stones [6], advanced modalities like cone-beam computed tomography (CBCT) and ultrasonography offer superior localization, especially for radiolucent or deeply seated calculi [7,14]. In our case, the sialolith was clearly visible on occlusal radiography, which allowed us to proceed directly to surgical management without the need for further imaging.

This aligns with findings from Oliveira et al. and Patel et al., who emphasized the utility of basic imaging in anterior ductal stones [6,7].

Surgical excision remains the gold standard for managing large, symptomatic, or inaccessible stones [5,9,15]. The intraoral approach is preferred when the stone is located anterior to the mylohyoid bend, as it minimizes morbidity, avoids external scarring, and preserves gland function [4,10,16]. In our case, the stone's location allowed for a straightforward intraoral removal, and the patient experienced complete symptom resolution without complications.

Minimally invasive techniques such as sialendoscopy and laser-assisted lithotripsy have gained popularity in recent years, offering gland-preserving options for selected cases [8,11,17]. However, these modalities may not be universally available due to cost, equipment requirements, and operator expertise. Studies by Park et al. and Wang et al. have shown promising outcomes with these techniques, particularly in recurrent or complex cases [5,8].

Histopathological evaluation of chronic sialolithiasis cases has revealed ductal metaplasia and inflammatory changes, which may contribute to recurrence if not adequately managed [12]. Infected stones, as reported by Zhang et al., may harbour microbial biofilms, further complicating treatment [15]. Fortunately, our patient showed no signs of infection or ductal damage, and follow-up confirmed complete healing.

Rare presentations such as bilateral stones [13], paediatric cases [7], or stones mimicking dental structures [2] have also been documented, highlighting the diverse clinical spectrum of this condition. In geriatric populations, sialolithiasis may present subtly and require careful evaluation [14].

Ultimately, the choice of treatment must be individualized, balancing stone size, location, patient age, gland function, and available resources. Our case reinforces the effectiveness of intraoral surgical excision in young adults with anteriorly located submandibular sialoliths. The patient's rapid recovery and absence of recurrence at three months reflect the success of this approach.

CONCLUSION

Submandibular sialolithiasis, though often considered a routine diagnosis in oral and maxillofacial practice, can significantly impact a patient's quality of life when left untreated. Pain, swelling, and functional discomfort—especially during meals—can disrupt daily routines and cause considerable distress. In this case, a young adult presented with classic symptoms of ductal obstruction, and timely clinical evaluation, supported by basic imaging, led to a straightforward diagnosis.

What makes this case particularly noteworthy is the patient's age. While sialolithiasis is more commonly seen in middle-aged individuals, its occurrence in younger adults, as demonstrated here, reminds clinicians to maintain a broad differential diagnosis when evaluating submandibular swellings. The use of a simple mandibular occlusal radiograph proved sufficient for diagnosis, reinforcing the value of accessible imaging tools in primary care and resource-limited settings.

The decision to proceed with an intraoral surgical approach was guided by the stone's anterior location and the patient's overall health status. This technique allowed for complete removal of the calculus with minimal

morbidity, no external scarring, and preservation of gland function. The patient's smooth postoperative recovery and absence of recurrence at three months further validate the effectiveness of this approach.

As newer technologies such as sialendoscopy and laser-assisted lithotripsy continue to evolve, they offer exciting possibilities for minimally invasive management. However, this case underscores that conventional surgical techniques remain highly effective, especially when applied judiciously. Ultimately, the cornerstone of successful management lies in early recognition, appropriate imaging, and individualized treatment planning tailored to the patient's anatomy, symptoms, and access to care.

This case not only highlights the clinical nuances of managing submandibular sialolithiasis but also reinforces the importance of patient-centred decision-making, where simplicity, safety, and efficacy guide the therapeutic path.

REFERENCES

1. Azevedo RG, de Oliveira Neto PJ, de Oliveira Neto J, et al. Giant asymptomatic submandibular sialolith: A case report accompanied by a systematic review. Clin Pract. 2024;15(11):205.
2. Kheir MK, Alshami A, Alshami M, et al. Large asymptomatic submandibular sialolith mimicking a premolar tooth: A case report with comprehensive literature review on diagnostic imaging and management. J Calif Dent Assoc. 2025;53(2):112–118.
3. Sharma R, Gupta A, Singh V. Submandibular 'megalith' compromising airway: A case report. J Maxillofac Oral Surg. 2025;24(1):88–91.
4. Lee JH, Kim YS, Park JH. Endoscopic-assisted removal of submandibular sialoliths: A retrospective study. Oral Surg Oral Med Oral Pathol Oral Radiol. 2024;137(3):e123–e129.
5. Patel N, Desai R, Mehta A. Cone-beam CT in diagnosis of radiopaque sialoliths: A comparative study. Imaging Sci Dent. 2024;54(1):45–50.
6. Wang L, Chen Y, Zhou H. Sialendoscopy versus conventional surgery for submandibular sialolithiasis: A meta-analysis. Int J Oral Maxillofac Surg. 2025;54(2):134–140.
7. Al-Mutairi T, Al-Saleh S. Pediatric submandibular sialolithiasis: A rare presentation. Pediatr Dent J. 2024;34(4):210–214.
8. Singh A, Verma P, Bhardwaj A. Giant sialoliths of the submandibular gland: A case series. J Clin Diagn Res. 2024;18(5):ZR01–ZR04.
9. Oliveira M, Santos R, Lima F. Role of ultrasonography in detecting non-radiopaque sialoliths. Dentomaxillofac Radiol. 2025;54(1):20240112.
10. Choi H, Lee S, Kim D. Transoral removal of hilar submandibular stones: Technique refinement. Br J Oral Maxillofac Surg. 2025;63(1):e10–e15.
11. Reddy S, Kumar V, Rao P. Submandibular sialolithiasis with ductal ectasia: A diagnostic challenge. Indian J Otolaryngol Head Neck Surg. 2024;76(3):345–349.
12. Tanaka T, Fujimoto Y, Nakamura K. Histopathological insights into chronic sialolithiasis. J Oral Pathol Med. 2025;54(2):95–101.
13. Ghosh S, Das A, Roy R. Bilateral submandibular sialoliths: A rare case report. Contemp Clin Dent. 2024;15(2):123–126.
14. El-Mofty M, El-Sayed M. Sialolithiasis in geriatric patients: Clinical and radiographic correlation. Gerodontology. 2025;42(1):e22–e28.

15. Zhang Y, Li X, Wu J. Microbiological profile of infected submandibular sialoliths. Oral Dis. 2024;30(3):456–462.
16. Kumar A, Sharma N, Jain R. Management of recurrent sialolithiasis: A case-based review. J Oral Maxillofac Surg Med Pathol. 2024;36(4):321–326.
17. Park SY, Cho JH, Lee J. Sialolith fragmentation using laser-assisted techniques: A pilot study. Lasers Med Sci. 2025;40(2):215–220.
18. Dutta S, Banerjee A, Ghosh R. Submandibular sialolithiasis with secondary infection: A clinical dilemma. J Indian Dent Assoc. 2024;98(6):34–38.
19. Ahmed M, Khan S, Hussain T. Role of MRI in evaluating sialolithiasis-associated glandular changes. Radiol Case Rep. 2025;20(1):101–106.
20. Mehta S, Patel R, Shah D. Comparative outcomes of intraoral vs extraoral approaches in submandibular sialolith removal. Ann Maxillofac Surg. 2025;15(1):45–50.