

CASE REPORT

Management of a large calculus developed following partial excision of the submandibular gland: A case report

Thuduvage VS¹  Wanniarachchi AA²¹ Department of Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka² Department of Otorhinolaryngology, University Hospital, Kotelawala Defence University, Sri Lanka

Article Information

Corresponding Author

Dr. Vasanthika Thuduvage

Email: vasanthikat@kdu.ac.lk <https://orcid.org/0000-0002-5730-5409> <https://doi.org/10.4038/sljms1.v2i1.56>

Received 02 June 2025

Accepted 20 August 2025

Conflicts of Interest: None

Declaration of patient's consent:

Obtained consent from the patient for publication as a case report.

Funding: No external funding was received to prepare the manuscript.

Abstract

A 62-year-old female with a history of partial submandibular gland excision for a benign lump presented with recurrent attacks of sialadenitis with abscess formation over the submandibular gland. Investigations revealed a giant submandibular calculus in the gland.

Initially, the patient was managed with intravenous antibiotics and incision and drainage. Later, submandibular gland exploration was done under general anaesthesia, and the remnant of the gland with the calculus was removed. The postoperative period was uneventful, and histology was confirmed as benign. This case report highlights that the submandibular gland should not be removed partially to prevent sialadenitis and sialolithiasis.

Keywords: giant submandibular calculus, partial submandibular gland excision, sialadenitis, sialiectasis, sialolithiasis

Introduction

The most prevalent non-neoplastic salivary gland condition, sialolithiasis, is characterized by the development of salivary calculi and primarily affects the submandibular glands. Because of Wharton's duct's anatomical orientation and alkaline mucinous composition, 80-90% of sialolithiasis occurs in the submandibular gland. Massive sialoliths (>15 mm) are uncommon and present serious therapeutic difficulties, particularly when exacerbated by recurrent infections or sialadenitis.¹ Most calculi are small and are treated conservatively. Elderly people are more likely to experience recurring infections, delayed wound healing, and altered glandular physiology, especially if they have metabolic comorbidities such as diabetes mellitus and hypothyroidism. Multimodal imaging and prompt surgical intervention are both vital in such scenarios.³

Cite this article as: Thuduvage VS, et al. Management of a large calculus developed following partial excision of the submandibular gland: A case report . SLJMS 2025; 2(1): 45-48



This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License, which permits unrestricted use, distribution and reproduction in any medium provided the original author and source are credited.

This report presents the comprehensive clinical course, radiological workup, surgical intervention, and post-operative recovery of this patient, emphasizing the role of multidisciplinary management in optimizing outcomes for sialolithiasis complicated by sialadenitis in a patient following partial submandibular gland excision. Furthermore, it aims to contribute to the limited body of literature on large sialoliths exceeding 2 cm in diameter, a rare clinical occurrence, particularly when complicated by recurrent infection in a diabetic patient.

Case report

The 62-year-old female patient presented to University Hospital KDU with left submandibular swelling, fever, pain, and difficulty in mastication. Her medical history included type 2 diabetes mellitus, dyslipidaemia, and hypothyroidism. She had undergone a partial removal of the submandibular gland 5 years ago due to a submandibular lump, where histology confirmed it was a benign lump. There were no signs of trismus. Intraoral examination revealed no pus discharge from Wharton's duct. Her random capillary blood glucose was 154 mg/dL. Biochemical investigations revealed significant laboratory markers of inflammation, including elevated C-reactive protein and leucocytosis (WBC: $13.5 \times 10^9/L$), serum creatinine of 0.82 mg/dL, and normal renal parameters with a normal level of sodium (Na^+ 137 mmol/L), further substantiating the diagnosis of active infection. An ultrasound scan of the neck confirmed a collection of pus (3cm $\times$ 5cm) and a calculus over the submandibular area.

Her clinical course included a period of IV antibiotic therapy, followed by surgical incision and drainage of pus under general anaesthesia. Calculus was not removed during this procedure.

The patient was reviewed later in the clinic, and a CT scan was done. A contrast-enhanced CT of the neck (Figure 1) revealed a hyperdense mass measuring $2.1 \times 2.1 \times 1.8$ cm within the left submandibular duct with associated periductal fat stranding, ductal dilation, and multiple reactive lymph nodes (lymphadenopathy) in cervical levels Ib and II. These findings were consistent with giant sialolithiasis and coexisting sialadenitis.

The patient underwent left submandibular gland exploration under general anaesthesia. Using the previous incision site, carefully dissect through dense adhesions and fibrotic tissue. Intraoperatively, a giant yellow-white stone (2.1 cm) was visualized and removed intact. Remnant of the glandular tissue was removed, with preservation of the lingual and hypoglossal nerves. Haemostasis was secured, and a drain was inserted. The skin closure was done with absorbable sutures. A specimen was sent for histopathological examination.

The patient was stable with no complications after the surgery. The marginal mandibular nerve of the facial nerve, the lingual nerve, and the hypoglossal nerve were intact post-operatively. On the third surgical day, the patient was discharged with instructions for follow-up and oral antibiotics. Histology was confirmed as chronic sialadenitis without any malignant changes.

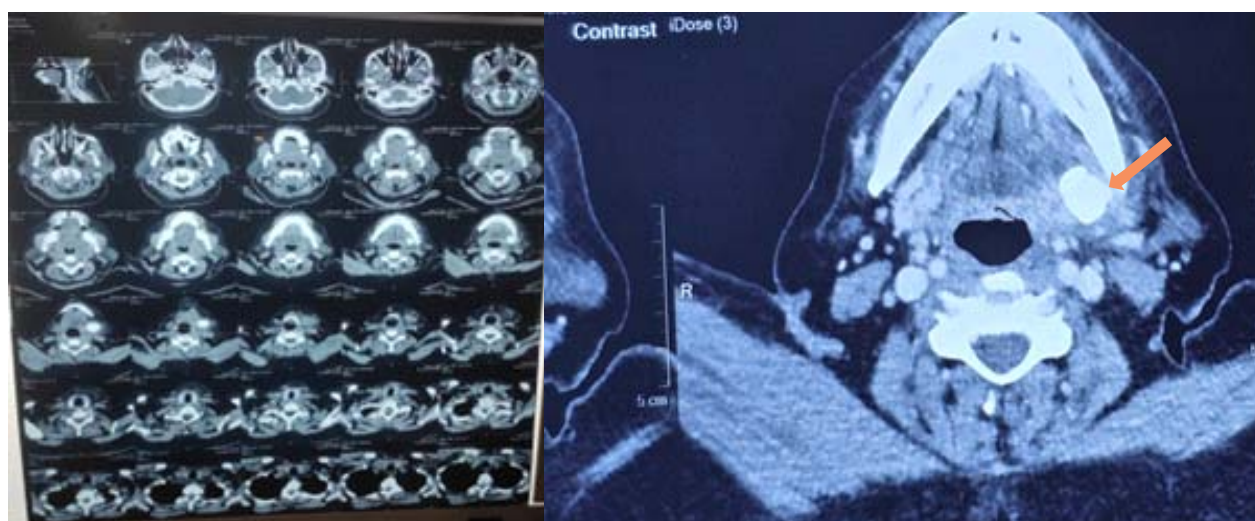


Figure 1. Contrast-enhanced CT showing submandibular calculus.

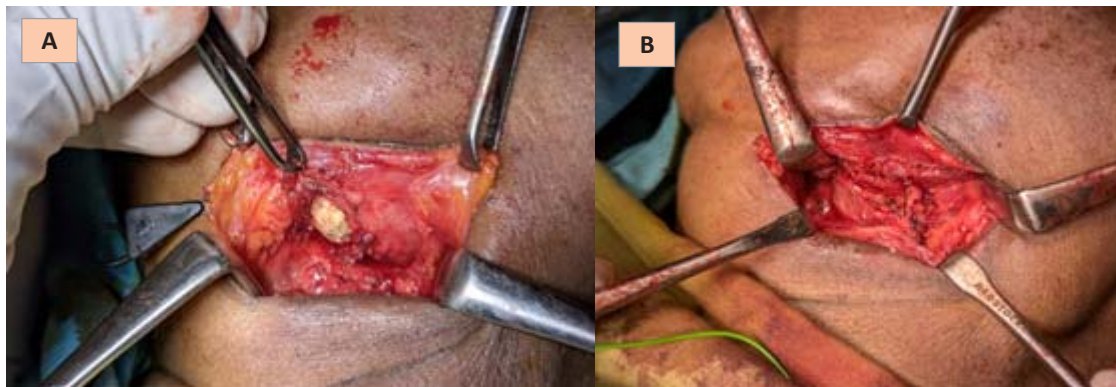


Figure 2. Intraoperative exposure of the gland showing the giant sialolith embedded in inflamed submandibular tissue (A); Preserved hypoglossal nerve and lingual nerve (B).

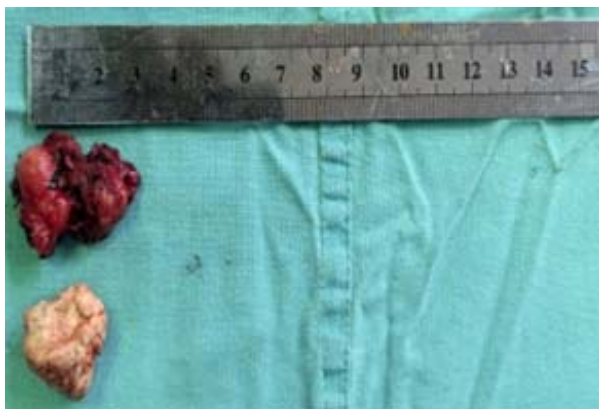


Figure 3. Removed calculus and the remnant of the submandibular gland tissue.

Discussion

The anatomical path of Wharton's duct and the alkaline, mucin-rich character of its secretions are the fundamental reasons why submandibular sialolithiasis remains the most prevalent non-neoplastic condition of the major salivary glands.¹ Giant sialoliths larger than 15 mm are uncommon, and calculi larger than 20 mm are regarded as extraordinary, while the majority of calculi are small and dealt with cautiously.² The patient in this instance had one of the largest calculi in the literature, measuring 2.1 cm. This was especially noticeable given that the patient had previously had a partial excision of the submandibular gland.

A surgically impacted gland, including this calculus, is probably the result of a complex aetiology. Remaining glandular tissue and ductal segments after partial gland removal may cause chronic inflammation, dystrophic calcification, and salivary stasis – all of which are factors that contribute to stone formation.^{3,4} In this instance, the

diagnosis of an active infection was supported by inflammatory indicators such as leucocytosis and increased C-reactive protein. The systemic comorbidities of this patient, such as hypothyroidism and type 2 diabetes mellitus, may also have contributed to altered glandular physiology and a compromised immunological response, making them more susceptible to stone formation and recurring obstruction.⁵

Partial removal of the gland during a previous surgical procedure is attributed to the sialectasis and recurrent infections leading to sialolithiasis.^{4,5}

Contrast-enhanced computed tomography (CECT) was essential for both surgical planning and diagnosis, as seen in Figure 1. Following chronic sialadenitis, imaging illustrated a 2.1 cm hyperdense calculus with reactive cervical lymphadenopathy, periductal fat stranding, and surrounding ductal dilatation. Abscess formation was ruled out due to the lack of rim-enhancing fluid accumulation. Detailed CT was the preferred modality for preoperative evaluation due to its high spatial resolution and multiplanar capabilities, especially in a preoperative field where altered anatomy presented additional barriers.^{6,9}

Given the presence of proximal impaction and the failure of conservative therapy, surgical exploration was selected. The intact sialolith was removed intraoperatively while the lingual and hypoglossal nerves were preserved with difficulty due to the dissection through fibrotic adhesions at the site of the prior incision.⁷ Histopathological analysis ruled out granulomatous or neoplastic processes and established chronic sialadenitis with reactive lymphoid hyperplasia, which is crucial in elderly patients with recurrent glandular swelling.⁸

Perioperative care was centred on glycaemic control and infection treatment, which helped ensure a smooth postoperative course.¹

In situations of ductal illness, partial excision of the submandibular gland may not be sufficient, leaving the remaining tissue liable to the growth of sialoliths in the future. To avoid long-term consequences, complete gland excision should be considered.¹⁰

Conclusion

Significant diagnostic and treatment hurdles arise when elderly individuals with systemic comorbidities have giant submandibular sialolithiasis. The importance of early, high-resolution imaging in identifying complicated sialoliths and directing surgical planning is shown by this instance. Conservative management may not be adequate in the presence of a proximal calculus, with previous surgeries, and recurring infections. Open gland exploration is required and is a useful method in these situations.

This case report highlights that partial removal of the submandibular gland should be avoided to prevent recurrent sialadenitis, sialectasis, and sialolithiasis in patients with submandibular gland pathology.

Acknowledgments

We acknowledge the patient who gave consent to publish this case report.

Authors' Contributions

Concept and design: TVS

Literature review: TVS

Writing the manuscript: TVS

Manuscript editing and proofreading: TVS, WAA

References

1. Medina J, Corey N, Hahn B. Acute Wharton's duct sialadenitis and submandibular infection. *The Journal of Emergency Medicine* 2013; **44**(1): e125-e127. doi.org/10.1016/j.jemermed.2012.02.065
2. Vasanthika T, Shantha P. Exposed giant submandibular duct calculus: A case report. *Open J Clin Med Case Rep*. 2019; 1546.
3. Koch M, Mantsopoulos K, Müller S, Sievert M, Iro H. Treatment of Sialolithiasis: What Has Changed? An Update of the Treatment Algorithms and a Review of the Literature. *Journal of Clinical Medicine* 2022; **11**(1): 231. doi.org/10.3390/jcm11010231
4. Adhikari R, Soni A. Submandibular Sialadenitis and Sialadenosis. [Updated 2022 Aug 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: www.ncbi.nlm.nih.gov/books/NBK562211
5. Avishai G, Rabinovich I, Gilat H, Chaushu G, Chaushu L. Surgical treatment of sialolithiasis leads to improvement in the complete blood count. *Biology*. 2021; **10**(5): 414.
6. Dinca OM, Bucur A, Zurac SA, Nita T, Jugulete G, Viadan, GC, Padurariu, LC. Chronic sclerosing sialadenitis of the bilateral submandibular glands in childhood – a diagnostic dilemma. *Romanian Journal of Morphology and Embryology = Revue Roumaine de Morphologie et Embryologie* 2024; **65**(1): 113-18. doi.org/10.47162/RJME.65.1.14
7. Sakr M. Sialolithiasis: Calculi of the Submandibular Gland. In *Surgery of the Salivary Glands: Diagnostic and Therapeutic Strategies* 2025; 399-417. Cham: Springer Nature Switzerland.
8. Badash I, Raskin J, Pei M, Soldatova L, Rassekh C. Contemporary Review of Submandibular Gland Sialolithiasis and Surgical Management Options. *Cureus* 2022; **14**(8): e28147. doi.org/10.7759/cureus.28147
9. Ungari C, Cicconetti A, Cerbelli E, Sulpasso A, Filiaci F. Giant submandibular sialolith: A case report. *La Clinica Terapeutica*, 2022; **173**(3): 217-21. doi.org/10.7417/CT.2022.2421
10. Chauhan I, Garg R. Recurrent pleomorphic adenoma of submandibular gland: a rare entity. *The Egyptian Journal of Otolaryngology* 2023; **39**(1): 123. doi.org/10.1186/s43163-023-00489-x