

# An Unusually Large Submandibular Gland Stone. A Case Report.

CD Emegoakor<sup>1</sup>  
GU Chianakwana<sup>2</sup>  
MC Ugonabo<sup>3</sup>  
CI Madubogwu<sup>4</sup>  
IBC Iloabachie<sup>5</sup>  
ACO Akam<sup>6</sup>

Department of Surgery<sup>1,2,4,5,6</sup>  
Nnamdi Azikiwe University  
Teaching Hospital, Nnewi,  
Nigeria.

Department of Chemical  
Pathology<sup>3</sup>  
University of Nigeria Teaching  
Hospital, Ituku- Ozalla,  
Enugu, Nigeria.

All Correspondence:  
Dr CD Emegoakor  
Department of Surgery  
Nnamdi Azikiwe University  
Teaching Hospital, Nnewi,  
Nigeria.

**E-mail:**  
Drchinemelum@yahoo.com

## Introduction

Sialolithiasis is the most common disease of the submandibular glands in middle-aged patients. It is estimated that it affects 12 in 1000 of the adult population<sup>1</sup>. Males are more frequently affected than females and children are rarely involved<sup>(2)</sup>. Sialolith can form in any of the salivary glands of the head and neck, but the submandibular gland is the commonest site (80.0% - 90.0%)<sup>2</sup>. Factors that tend to favour submandibular gland stones are

- (1) Longer and larger caliber ducts and slower rates of flow in the submandibular gland compared to the other ducts.
- (2) The fact that saliva flows against gravity in the submandibular gland.
- (3) The presence of more alkaline saliva in the submandibular gland, and
- (4) The high mucin and calcium content of the saliva in the submandibular gland.

Lower incidence of calculi is found in the parotid duct and the sublingual duct (6.0% to 20.0%), (1.0 to 2.0%) respectively<sup>2,3</sup>. Multiple calculi in the submandibular gland are rar<sup>4</sup>, just as simultaneous

## Abstract

---

A Case of 65 year old man that presented with 40 years history of right lower jaw swelling, that became associated with pain two weeks prior to presentation. Examination revealed an elderly man with an enlarged tender right submandibular gland. The medial margin was suppurating. X-ray of the right lower jaw revealed large stone, while ultrasound scan of the right submandibular region revealed an associated abscess. The latter was incised and drained, while excision of the right submandibular gland and calculus was carried out three weeks later. 5.0cm - sized stone was excised. This turned out to be the second largest salivary gland stone recorded in literature.

## Conclusion

Giant salivary gland stone which ( greater than 1.5cm) is rare. To the best of our knowledge, our index patient with a calculus measuring 5.0 x 3.0cm is the second largest stone in literature is remarkable

---

**Key Words:** Giant Salivary Gland Stone, Submandibular Gland

---

Lithiasis in more than one salivary gland<sup>(5)</sup>. Submandibular stones close to the helium of the gland of the stone tend to become large before they become symptomatic<sup>6</sup>.

Commonly, sialoliths measure from 1mm to less than 10mm. Giant salivary gland stones (GSGS) are those stones measuring over 15mm and have been rarely reported in the medical literature<sup>7,8</sup>. GSGS measuring over 30mm are extremely rare, with only scant reported cases<sup>9</sup>.

The aim of this article is to present a case of a giant sialolith in the light of the literature on giant sialoliths.

## Case Report

A 69 year old man presented in the surgical outpatient clinic with a right jaw swelling of 40 years duration. This became associated with fever, pain and difficulty in swallowing 4 days prior to presentation.

The swelling was initially the size of a pea nut and gradually progressed to the size of an egg. The swelling increases with feeding, and usually reduces after feeding. The associated pain was worse on feeding, severe and non-radiating. Fever was high

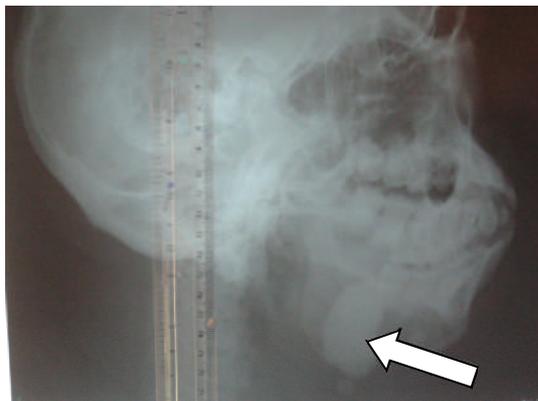
grade, there was no change in salivation, no lumps in any other part of the body and no associated weight loss.

On examination, there was a mass in the right submandibular region measuring 120mm x 100mm, tender with differential warmth, with a purulent area pointing externally. There was no intraoral extension, and no attachment to skin or underlying structures. Bimanual palpation revealed a mass of 120mm x 100mm with no other defined mass. Immediate incision and drainage was done, this let out 10ml of pus. Plain x-ray of the jaw showed 2 calcific densities in the region of the right mandible, the larger measured 50mm x 30mm while the smaller measured 10mm by 5mm. The bones were normal. Serum electrolytes were essentially normal. Ultrasound of the neck also showed hypodense area within the swollen submandibular gland.

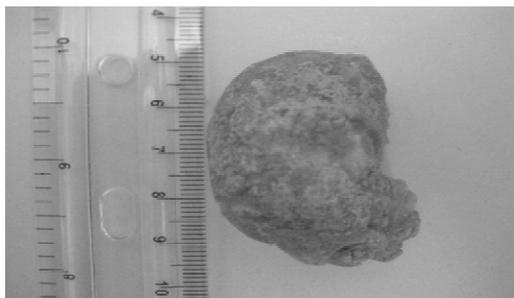
The submandibular gland was later excised via an incision 20mm below the angle of the jaw. The excised gland contained two stones, one measuring 50mm x 30mm and to other 10mm by 5mm. (figure i) Wound healing was uneventful and patient was discharged home after five days of operation.

Chemical analysis of the stone showed it to be composed of calcium, phosphate, cystine, oxalate, carbonate and magnesium. Xanthine and uric acid were negative. (figure ii)

**Figure 1:** X-ray view of the Submandibular gland stone.



**Figure 2:** Submandibular Stone.



**Discussion**

Although large sialoliths have been reported both in salivary glands<sup>10,11</sup> and in salivary ducts,<sup>12-15</sup> stones larger than 3cm are rare<sup>9</sup>.

In 2002, Bodner<sup>7</sup> reported that only 14 well documented cases had been published in literature. A review of literature in 2007 found only 16 reported cases of salivary stones having a size up to 35mm<sup>16</sup>.

The largest sialolith reported to date measured 55mm<sup>17</sup>. Our index case measuring 50mm is the second largest case ever reported in literature and this makes it remarkable.

As exemplified by the index case, approximately 80.0% of submandibular stones are radiopaque on standard x-ray films<sup>18</sup>. Ultrasonography is a popular non-invasive modality used to diagnose sialolithiasis, but it is operator dependent and it does not provide the surgeon with a direct anatomic image of localization<sup>19</sup>. CT scan can pick up large stones, and it can detect smaller stones if 1-mm fine cuts are obtained. Accurate localization of the stones and precise anatomy, however is lacking with CT<sup>20</sup>. Sialography has conventionally been the gold standard because it not only diagnoses sialolithiasis, it also provides an image of the ductal system. However, sialography subjects the patient to radiation and carries a risk of ductal perforation and retrograde displacement of the stone with injection<sup>21</sup>.

Submandibular stone, are typically removed surgically through either an intraoral or an external approach<sup>22,23</sup>. The most appropriate mode of treatment depends primarily on the location of the stone. An intraoral approach is often utilized when the calculi are located anterior to the lingual nerve and artery. This method of approach can lead to lingual nerve anaesthesia. The lingual nerve loops around the mid to distal position of Warthin's duct before it enters the tongue. It is in this area that the nerve can easily be injured.

Generally, for stones that are located entirely in the duct and close to the papillae, intraoral approach is sufficient.

For intraglandular stones and for stones embedded in the hilum of the gland, a submandibular gland excision via an extraoral approach is indicated as in the index case.

Among newer treatment methods are external lithotripsy and different techniques in interventional sialondoscopy, including wire-basket extraction and fibreoptic laser lithotripsy with basket retrieval<sup>22</sup>.

### Conclusion

Giant submandibular gland stone are rare, our index case being, to the best of our knowledge, the second reported case in literature, is remarkable.

### References

1. Leung AK, Choi MC, Wagner CA. Multiple Sialoliths and a Sialolith of unusual size in the submandibular duct. *Oral surg. Oral med, oral path, oral Radiol, Endo* 1999; 87:331-333.
2. McKenna JP, Bostock DJ, McMenamin PG. Sialolithiasis. *Am Fam Physician* 1987; 36:119-25.
3. Gayner SM, Kane WJ, McCaffrey TV. Infections of the salivary gland. In Cummings CW, ed. *Otolaryngology Head and Neck Surgery*. 3. St. Louis: Mosby: 1998: 1239-40.
4. Tepan MG, Rohiwal RC. Multiple salivary calculi in Wharton's duct. *J Laryngol Otol* 1985; 99: 1313-1314.
5. Iro H, Zenk J, Waldfahrer F, Benzel W. Current status of minimally invasive treatment methods in Sialolithiasis HNO. 1996; 44(2):78-84.
6. Caner Sahin, Yavuz Fuat Yilmaz, Ali Titiz, Ramazan Ocak, Muge Ozcan. Giant calculi of the submandibular gland. A case report. *World articles in Ear, Nose and Throat vol. 2* 1: 2009.
7. Bodner L. Giant salivary gland calculi: diagnostic imaging and surgical management. *Oral Surg. Oral Med Oral Pathol Oral Radiol Endod.* 2002; 94 (3): 320-3.
8. Soares EC, Costa FW, Pessoa RM, Bezerra. Giant salivary calculus of the submandibular gland. *Otolaryngol Head Neck Surg.* 2009; 140 (1): 128-9.
9. Ledesma-Montes C, Garces Ortiz M, Salcido-Garcia S, Hernandez-flores F, Hernandez-Guerrero H. Giant sialolith, case report and review of literature. *J Oral Maxillofac Surg* 2007; 65:128-30.
10. Akin I, Esmer N. A. submandibular sialolith of unusual size. A case report. *J. Otolaryngol* 1991; 20:123-5.
11. Zakaria MA: Giant calculi of the submandibular salivary gland. *Br J Oral Surg* 1981; 19:230-2.
12. Siddiqui SJ. Sialolithiasis. An usually large submandibular salivary stone. *Br Dent J* 2002; 193:89-91.
13. Raksin SL, Gould SM, Williams AC. Submandibular duct sialolith of unusual size and shape. *J. Oral surg* 1975; 33:142-5.
14. Mustard TA. Calculus of unusual size in Wharton's duct. *Br Dent J* 1945; 79:129.
15. Brusati R, Fiamminghi L. Large calculus of the submandibular gland: Report of case. *J Oral surg* 1973; 31:710-11.
16. Paul D, Chauhan SR. Salivary megalith with a sialo-cutaneous and a sialo-oral fistula. A case report. *J. Laryngol* 1995; 109:767-9.
17. Thoma KH, Gorlin RJ, Goldman HM, eds. *Thomas' Oral Pathology*. Lt. Louis: Mosby: 1970.
18. Rinast E, Gmelin E, Hollands-Thorn B. Digital subtraction sialography. Conventional sialography, high-resolution ultrasonography and computed tomography in the diagnosis of salivary gland diseases. *Eur J Radiol* 1989; 9: 224-30.
19. Avrahami E, Engender M, Chen E. CT of submandibular gland sialolithiasis. *Neuroradiology* 1996; 38:287-90.
20. Cockrell DJ, Rout PE: An Adverse reaction following sialography. *Dentomaxillofac Radiol* 1993; 22:41-2.
21. Ledesma-Montes C, Garces Ortiz, Salcido Garcia J, Hernandez Flores F, Hernandez-Geurrero H, Giant Sialolith, Case report and review of literature. *J Oral Maxillofac surg.* 2007; 65:128-30.
22. Zenk J, Constantinidis J, Al-kadah b, Iro H, Transoral removal of submandibular stones. *Arch Otolaryngol. Head neck surg.* 2001; 127:432-6.
23. Marchal F, Dulgnerov P. Sialolithiasis management, The state of the art. *Arch otolaryngol Head neck surg.* 2003; 129:951-6.