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Case report of a maxillary antrolith

Tan Yong Leng Thurston^{a,*}, Yang Zhang^a, Bertrand Chew Shen Hui^b^a Ng Teng Fong General Hospital, 1 Jurong East Street 21, 609606, Singapore^b Dept of Oral & Maxillofacial Surgery, Ng Teng Fong General Hospital, 1 Jurong East Street 21, 609606, Singapore

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ABSTRACT

INTRODUCTION: Antroliths, which are pathological calcifications within the maxillary sinus, are a rare occurrence. While some may present with symptoms, most maxillary antroliths are asymptomatic incidental findings.**PRESENTATION OF CASE:** We report a case of a 67-year-old lady with a round radiopacity within her right maxillary sinus as seen on the panoramic radiograph. Subsequent cone beam computed tomography (CBCT) scan detailed a well circumscribed radiopacity at the floor of the maxillary sinus. Surgical excision was done via Caldwell-Luc procedure.**DISCUSSION:** A review of literature was carried out with particular reference to the etiology, clinical and radiographic features and management of antroliths. Radiological examination of the sinus by standard Waters, panoramic radiograph and CT scan can aid in identification and diagnosis. While biopsy may be indicated to rule out differential diagnoses with similar presentations, in otherwise small and asymptomatic antroliths, they are generally left alone and periodic check-ups appear to be the primary choice of treatment. Surgical removal is considered the treatment of choice for antroliths with complications.**CONCLUSION:** With regular long term follow ups, prophylactic removal of small and asymptomatic antroliths may not be necessary. However, treatment options should be presented to the patient and the ultimate decision lies with the patient with informed consent taken.© 2020 The Author(s). Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Antroliths are a rare occurrence. This rare entity was first described by Bartholin in 1654 and is defined as pathological calcifications consisting of mineral salt depositions around a central nidus in the maxillary sinus [1].

Most maxillary antroliths are asymptomatic incidental findings on routine radiographic examinations [2]. Hence in the case of small and asymptomatic antroliths, they are generally left alone and periodic check-ups appear to be the primary choice of treatment [3]. Conversely, surgical removal is recommended as the treatment of choice for antroliths causing irritation and sinus destruction [4]. Surgical removal of maxillary antroliths is performed through either endoscopic sinus surgery (ESS), Caldwell-Luc or a combination of both [1,5].

Antroliths are generally found in the inferior nasal meatus or between the inferior turbinate and the nasal septum [5,6]. The prevalence of antroliths in maxillary sinuses is low, ranging from 0.15% to 3.2% [1]. In this article, we present a rare case of a maxillary antrolith at the floor of the right maxillary sinus in a 67 year old female patient and its management. This work has been reported in line with the SCARE criteria [7].

Antrolith at the floor of the right maxillary sinus in a 67 year old female patient and its management. This work has been reported in line with the SCARE criteria [7].

2. Presentation of case

The patient, a 67-year-old lady, was referred to us for management of a well-defined, rounded radiopacity within her right maxillary sinus seen on her dental panoramic radiograph (Fig. 1). This was an incidental finding detected by the referring dentist and the patient did not complain of any symptoms. Her medical records revealed that she was diagnosed with left breast cancer in 2019 and underwent wide local excision thereafter. She completed both chemotherapy and radiotherapy before being referred for dental clearance prior to starting antiresorptive Denosumab treatment. Other relevant medical history also includes hypertension and hyperlipidaemia.

Her extra-oral examination appeared well with no obvious abnormalities. Intra-oral examination revealed the presence of 2 upper molars remaining (#17 and #27) in her maxillary arch as well as partial edentulism in her mandibular arch. Specific to quadrant 1, the upper right molar (#17) had a radiopaque occlusal amalgam restoration. The tooth was responsive to pulp sensitivity test with no other abnormalities detected. Cone beam computed tomography scan (CBCT) of the maxilla was prescribed for further

* Corresponding author.

E-mail addresses: thurston.tan@mohh.com.sg (Y.L.T. Tan), yang.zhang@mohh.com.sg (Y. Zhang), Bertrand.Chew@nuhs.edu.sg (B. Chew Shen Hui).



Fig. 1. Dental panoramic radiograph of the patient. A well-defined, rounded radiopacity was visualised within her right maxillary sinus.

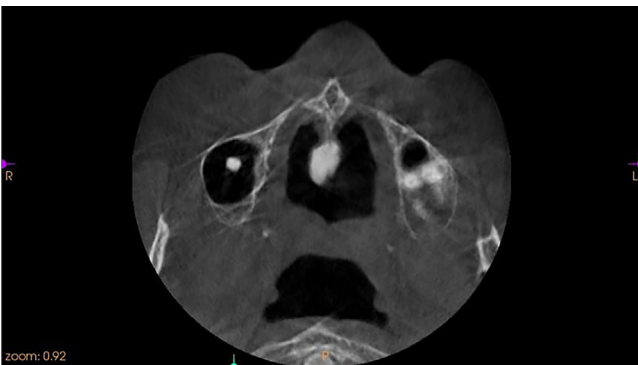


Fig. 2. Transverse view of patient's CBCT. A well-defined radiopacity was visualised within the right maxillary sinus approximating the roots of the upper right molar.



Fig. 3. Sagittal view of patient's CBCT. A well-defined radiopacity was visualised within the right maxillary sinus approximating the roots of the upper right molar.

examination of the radiopacity. The scan showed a circumscribed, dense radiopacity measuring 3.1 mm × 3.6 mm at the floor of the right maxillary sinus, approximating the buccal roots of the upper right molar (Fig. 2, Fig. 3). No opacification and no mucoperiosteal thickening of the sinuses were noted.

Patient was informed of the provisional diagnosis of maxillary antrolith given its clinical and radiographic presentations. Treatment options were presented and the patient asked for removal and biopsy as she was worried that it might be related to her history of breast cancer even after reassurances were given that it was unlikely.

The CBCT scan was reviewed and measurements taken as references for the surgical access (Fig. 4). Caldwell Luc procedure was done under local anaesthesia with no intraoperative complications. A small round buccal window of about 5 mm in diameter was made 20 mm from the cuspal edge of #17. Upon access, the antrum was inspected with the calculi clearly visible. The calculi (Fig. 5) was retrieved and sent for histopathologic evaluation. Closure of the

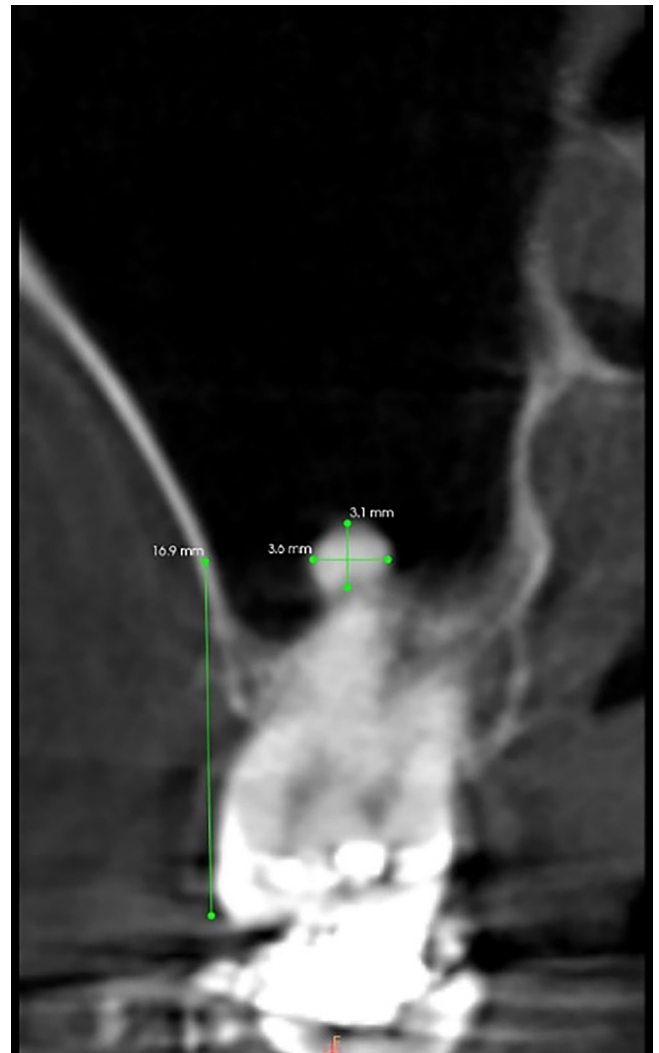


Fig. 4. Sagittal view of patient's CBCT with measurements. Radiopacity measuring 3.1 mm × 3.6 mm. A vertical reference point of 16.9 mm from the cuspal edge of the upper molar was measured with the CBCT and used as a guide for access.

wound was done with 5/0 Prolene. The patient recovered uneventfully.

The histopathology diagnosis was that of metaplastic bone and calcification. This confirmed our provisional diagnosis of maxillary sinus antrolith.

3. Discussion

A review of literature on Pubmed with particular reference to the etiology, clinical and radiographic features and management was carried out.

While the etiology of antroliths are not well understood, they are believed to be formed by the precipitation of calcium salts around a central nidus, which can be endogenous, such as tooth or bony fragments, blood, mucus or fungi, or exogenous such as gutta percha [1]. The surrounding inflammation around the central nidus is thought to encourage mineral deposition and thus the formation of antrolith [8]. However in the presence of inflammation, ciliary clearance and the mucus barrier, which would otherwise play a protective role in preventing salt crystal formation, are affected causing a stasis of secretion allowing for calcium salts to be deposited around a nucleus [6].



Fig. 5. Image of excised calculi. Calculi after removal and sent for histopathology analysis.

Antroliths can be found in patients of all ages and they appear to be found more commonly in women with studies documenting a 55–60% incidence in female patients [3,9]. In our case, the patient was a 67-year-old lady and this was in line with the gender predisposition.

As maxillary antroliths are usually asymptomatic, most cases are incidental findings on routine radiographic examinations similar to our documented case. Possible symptoms of includes epistaxis and facial pain, chronic sinusitis, nasal obstruction, purulent discharge, foul smelling post nasal drip, otorrhea, anosmia, cacosmia, hyposmia and halitosis [5,8]. These symptoms are often associated with the diagnosis of allergic rhinitis and sinusitis which may warrant further investigations [10].

Additional investigations such as radiological examination of the sinus by standard Waters as well as CT scan can aid in identifying the type of pathology [11]. CT scans aids in identification of the origin of the antrolith, localization of the antrolith and is

able to demonstrate any associated complications [6]. Hence in our present case, the decision was made to supplement our radiographic findings with a CT scan. Their typical appearance on a CT scan is descriptive of a homogenous, high-density periphery with central area of lower density [12]. However, they may take up a variety of radiographic presentations and in our case, the antrolith presented as a circumscribed, dense radiopacity [5]. Nonetheless, CT scans are still considered the preferred modality as its efficacy in identifying antroliths is well documented [3]. If necessary, rigid endoscopes may also aid to confirm the diagnosis [13]. This was not required in our reported case.

Based on radiographic findings, differential diagnosis includes impacted teeth, root fragments, osteomyelitis, calcified mucus retention cysts, calcified polyps, ossifying fibroma, fungal ball calcification and benign or malignant tumours [8,14]. Rare examples of benign tumours such as nasal glioma, septal dermoid and enchondroma may also resemble an antrolith [14]. Thus, clinical correlation is critical and it had also been suggested that removal of the mass for histological evaluation to establish the exact nature of the lesion, even in asymptomatic cases, may be justified [15].

In otherwise small and asymptomatic antroliths, they are generally left alone and periodic check-ups appear to be the primary choice of treatment [3]. Surgical removal is considered the treatment of choice for antroliths with complications [16]. These complications, due to irritation and destruction as a result of the antrolith, includes facial tetanus, septal perforation, destruction of medial wall of maxillary sinus with recurrent sinusitis, palatal perforation, oral fistula and rarely osteomyelitis and epidural abscess [8]. In surgical removal, maxillary rhinoliths are removed under local or general anaesthesia through either endoscopic sinus surgery (ESS), Caldwell-Luc or a combination [1,5]. A Caldwell-Luc procedure under local anaesthesia was carried out in our case as our patient was cooperative and it provided sufficient access and visibility for excision of the calculi. In complex cases where septal or antral perforation has occurred, more extensive surgery may be necessary, with consideration for reconstruction of the sinonasal anatomy in severe cases [6,14]. Studies also advocate that treatment should be supplemented with concomitant treatment of the sinus infection [1]. The prognosis is generally good as surgical outcomes are favourable and recurrences have not been documented [17].

4. Conclusion

In conclusion, antroliths are a rare occurrence. With regular long term follow ups, prophylactic removal may not be necessary. The pros and cons of each treatment option must be explained to the patient and the ultimate decision lies with the patient with informed consent taken.

Declaration of Competing Interest

The authors report no declarations of interest.

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Ethical approval

Ethical approval is exempted as this is a case report.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Authors contribution

Tan Yong Leng Thurston: Contributed to the study design, acquisition of data through literature search, data analysis and interpretation, drafting of the article.

Zhang Yang: Contributed to the study design, data analysis and interpretation, drafting of the article.

Bertrand Chew Shen Hui: Contributed to the study concept, data collection – carried out procedure, providing critical revision to the article, approved the submission of manuscript.

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CRedit authorship contribution statement

Tan Yong Leng Thurston: Methodology, Writing - original draft, Visualization. **Yang Zhang:** Methodology, Writing - original draft, Visualization. **Bertrand Chew Shen Hui:** Conceptualization, Investigation, Writing - review & editing, Supervision.

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References

- [1] M. Nass Duce, D.Ü. Talas, C. Özer, A. Yildiz, F.D. Apaydin, A. Özgür, Antrolithiasis: a retrospective study, *J. Laryngol. Otol.* 117 (2003) 637–640, <http://dx.doi.org/10.1258/002221503768199997>.

- [2] G. Manjaly, A.L. Pahor, Antral rhinolithiasis and tooth filling, *Ear Nose Throat J.* 73 (1994) 676–679, <http://dx.doi.org/10.1177/014556139407300911>.
- [3] B. Cho, Y. Jung, J. Hwang, Maxillary antroliths detected by cone-beam computed tomography in an adult dental population, *Imaging Sci. Dent.* 49 (2019) 59, <http://dx.doi.org/10.5624/isd.2019.49.1.59>.
- [4] P. Güneri, A. Kaya, M.K. Çalışkan, Antroliths: survey of the literature and report of a case, *Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod.* 99 (2005) 517–521, <http://dx.doi.org/10.1016/j.tripleo.2004.07.021>.
- [5] V. Shenoy, V. Maller, V. Maller, Maxillary antrolith: a rare cause of the recurrent sinusitis, *Case Rep. Otolaryngol.* (2013) 1–4, <http://dx.doi.org/10.1155/2013/527152>.
- [6] J. Hsiao, C. Tai, K. Lee, K. Ho, W. Kou, L. Wang, Giant rhinolith: a case report, *Kaohsiung J. Med. Sci.* 21 (2005) 582–585, [http://dx.doi.org/10.1016/s1607-551x\(09\)70212-8](http://dx.doi.org/10.1016/s1607-551x(09)70212-8).
- [7] R.A. Agha, M.R. Borrelli, R. Farwana, K. Koshy, A.J. Fowler, D.P. Orgill, For the SCARE Group, The SCARE 2018 statement: updating consensus surgical CAseREport (SCARE) guidelines, *Int. J. Surg.* 60 (2018) 132–136, <http://dx.doi.org/10.1016/j.ijsu.2018.10.028>.
- [8] R. Singh, S. Varshney, S. Bist, N. Gupta, R. Bhatia, S. Kishore, Rhinolithiasis and value of nasal endoscopy: a case report, *Internet J. Otorhinolaryngol.* 7 (2007), retrieved 1 June 2020 from <http://ispub.com/IJORL/7/2/8250>.
- [9] L.S. Pinto, E.B. Campagnoli, R. De Souza Azevedo, M.A. Lopes, J. Jorge, Rhinoliths causing palatal perforation: case report and literature review, *Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod.* 104 (2007) e42–e46, <http://dx.doi.org/10.1016/j.tripleo.2007.05.022>.
- [10] Q. Aljfout, M. Saraireh, A. Maita, Rhinolith misdiagnosed as allergic rhinitis: case report, *Electron. Physician* 8 (2016) 1880–1883, <http://dx.doi.org/10.19082/1880>.
- [11] A. Haraji, N. Mohtasham, M.R. Zareh, H. Pezeshkirad, Antrolith in the maxillary sinus; report of a case, *Front. Dent.* 3 (2006) 104–106, retrieved 1 June 2020 from <http://jdt.tums.ac.ir/index.php/jdt/article/view/89>.
- [12] S.A. Royal, R.E. Gardner, Rhinolithiasis: an unusual pediatric nasal mass, *Pediatr. Radiol.* 28 (1998) 54–55, <http://dx.doi.org/10.1007/s002470050292>.
- [13] E. Yildiz, S. Kuzu, Ş. Ulu, O.K. Kahveci, Ç. Günebakan, A. Bucak, Rhinoliths: Analysis of 24 interested forgotten foreign body cases, *Ear Nose Throat J.* (2020), <http://dx.doi.org/10.1177/0145561320908477>, 0145561320908477.
- [14] S.H. Lo, Y.Y. Wu, P.C. Wang, Maxillary anthrolith, *Mid. Taiwan J. Med.* 8 (2003) 238–241.
- [15] D.D. Blaschke, F.A. Brady, The maxillary antrolith, *Oral Surg. Oral Med. Oral Pathol.* 48 (1979) 187–189, [http://dx.doi.org/10.1016/0030-4220\(79\)90059-8](http://dx.doi.org/10.1016/0030-4220(79)90059-8).
- [16] P. Güneri, A. Kaya, M.K. Çalışkan, Antroliths: Survey of the literature and report of a case, *Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod.* 99 (2005) 517–521, <http://dx.doi.org/10.1016/j.tripleo.2004.07.021>.
- [17] M. Dogan, D. Ozdemir Dogan, C. Düger, S. Polat, S. Muderris, Recurrent rhinolithiasis: a case report with review of the literature, *West Indian Med. J.* 61 (2012) 760–763.

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