ISSN 1983-5183

Rev. Odontol. Univ. Cid. São Paulo
2013; 25(3): 254-60, set-dez

ASYMPTOMATIC ANTROLITH IN MAXILLARY SINUS. REPORT OF A CASE.

ANTRÓLITO ASSINTOMÁTICO NO SEIO MAXILAR. RELATO DE CASO

Ariel Valente Bezerra*
Manoel de Jesus Rodrigues Mello**
Rodolfo Cavalcante Lira***
Daniel Ximenes da Silveira****
Gabriel Silva Andrade*****
Bruno Rocha da Silva******
Andréa Sílvia Walter de Aguiar*******

ABSTRACT

Antroliths are depositions composed of minerals, such as calcium phosphate, located around a foreign body into the sinuses; the maxillary sinus is most affected by antroliths, followed by the frontal sinus. The aim of this study was to report the case of the patient JVS, a 63-year-old male with no health disorders who was referred to the oral and maxillofacial surgery department of a reference hospital in Fortaleza, CE, Brazil, as a victim of a motorcycle accident. On physical examination, it was found that the patient exhibited fracture of the left maxillary and zygomatic bones. Upon examination by computed tomography imaging, besides the fracture lines, a hyperdense area of well-defined limits in the left maxillary sinus was observed. In surgical treatment, after fixation of facial fractures, a Caldwell-Luc access without lower meatal antrostomy was performed for foreign body removal and sinusectomy with restoration of sinus drainage. The foreign body was sent for histopathological study, which suggested the presence of an exogenous antrolith of the left maxillary sinus. Thus, it can be concluded that a careful analysis of imaging tests may show unusual changes found in the antral cavity, even without the occurrence of any clinical symptoms.

DESCRIPTORS: Surgery, oral • Paranasal sinuses • Foreign bodies

RESUMO

Antrólitos são constituídos de deposições minerais como o fosfato de cálcio em torno de um corpo estranho dentro dos seios paranasais, dentre os quais o seio maxilar constitui-se o mais acometido, seguido do seio frontal. O objetivo do presente trabalho é relatar o caso do paciente J.V.S., sexo masculino, 63 anos, normossistêmico, vítima de atropelamento motociclístico, que foi encaminhado para o serviço de cirurgia e traumatologia bucomaxilofacial de um hospital de referência em Fortaleza, CE, Brasil. Ao exame físico, constatou-se que o paciente portava fratura dos ossos maxilar e zigomático esquerdos. Ao exame imaginológico por tomografia computadorizada, além das linhas de fraturas, foi visualizada uma área hiperdensa de limites bem definidos em seio maxilar esquerdo. No tratamento cirúrgico, após a fixação das fraturas faciais, foi realizado acesso de Caldwell-Luc sem antrotomia meatal inferior para remoção do corpo estranho e sinusectomia com restabelecimento da drenagem sinusal. O corpo estranho foi enviado para estudo histopatológico que apresentou laudo sugestivo de antrólito exógeno no seio maxilar esquerdo. Dessa forma, pode-se concluir que a análise criteriosa dos exames de imagem pode evidenciar alterações incomuns encontradas nas cavidades antrais, mesmo sem a ocorrência de nenhuma sintomatologia clínica.

DESCRITORES: Cirurgia bucal • Seios paranasais • Corpos estranhos

* Residente em cirurgia e traumatologia Bucomaxilo faciais – Instituto Dr. José Frota (IJF). Email: ariel_valente@hotmail.com
** Mestre em Cirurgia e Doutorando em Odontologia: area de concentração em Cirurgia pela Universidade Federal do Ceará (UFC), Chefe do Serviço de Cirurgia e Traumatologia Bucomaxilo Faciais – Instituto Dr. José Frota (IJF), Fortaleza/CE, Brasil. Email: mjrmello@gmail.com
*** Cirurgião Bucomaxilo facial – Hospital Batista Memorial (HBM), Fortaleza/CE, Brasil. Email: rod_lira@hotmail.com
**** Cirurgião Bucomaxilo facial – Hospital Batista Memorial (HBM), Fortaleza/CE, Brasil. Email: danielximenes@globo.com
***** Cirurgião Bucomaxilo facial – Hospital Batista Memorial (HBM), Fortaleza/CE, Brasil. Email: gabriel_s_odonto@yahoo.com.br
****** Mestre em Biotecnologia e Doutorando em Biotecnologia – RENORBIO/ Universidade Federal do Ceará (UFC), Fortaleza/CE, Brasil. Email: brunorocha747@gmail.com
******* Professora Adjunto do Departamento de Clínica Odontológica da Faculdade de Farmácia, Odontologia e Enfermagem (FFOE) da Universidade Federal do Ceará (UFC), Fortaleza/CE, Brasil. Email: andrea.aguiar@ufc.br

ISSN 1983-5183

INTRODUCTION

Calcareous bodies in the paranasal sinuses and nasal cavity are rare but well-recognised phenomena. Among these, maxillary antroliths can be highlighted. Antroliths are calcified bodies that are formed as a result of the deposition of minerals around a core within the sinus cavity[1].

This type of dystrophic calcification is rare, and its origin can be endogenous as mucus, pus and blood clots, or exogenous as roots, dental materials, and vegetable substances, among others[2].

Approximately 25% of cases of foreign bodies (FB) in the paranasal sinuses are affected by accident and 60% are iatrogenic. This form occurs during dental, ophthalmic or otorhinolaryngological procedures. Among the involved paranasal sinuses, the maxillary sinus is the most affected (75%), followed by the frontal sinus (18%)[3, 4]. The anatomical proximity between the upper posterior teeth and the maxillary sinus contributes to possible oroantral communications and the subsequent inoculation of FB to its interior[5, 6].

Although the pathogenesis of antroliths is not well understood, the major factors that may be related are a long duration of infection, insufficient sinus drainage and the presence of FB[7].

Figure 1 – *Axial CT scan indicating the presence of hyperdense foreign body and narrowing in the posterior region of the left maxillary sinus, as well as fracture lines in the anterior wall and lateral sinus, suggestive of bilateral Le Fort II fracture.*

This study aims to report a case of removal of an antrolith that was located in the left maxillary sinus during corrective surgery due to facial trauma.

CASE REPORT

Patient JVS, a 63-year-old male victim of a motorcycle accident with no related health disorders, was referred to the oral and maxillofacial emergency department of a hospital for emergency trauma cases in the state of Ceará, Brazil.

During anamnesis, the patient reported that he had undergone extraction 30 years ago. He also reported that after the surgery, he came to have some discomfort in the left side of the face and casual secretion by the alveolar ridge. The intraoral examination showed an edentulous condition without clinical signs of gingival swelling, and extraoral examination revealed a loss of projection in the region of the left zygomatic bone and the infra-orbital rim gap.

After completion of the initial clinical examination, a computed tomography (CT) of the face was performed in axial and sagittal incidences. Fractures of the maxillary and zygomatic bones were detected. In addition to fractures, a hyperdense area in the posterior region of the left maxillary sinus with well-defined borders was identified (Figure 1).

The treatment involved the surgical reduction and fixation of these fractures with the performance of rigid internal fixation with 1.5 mm miniplates in the region of the fronto-zygomatic suture and a 2.0 mm system in the left zygomatic pillar. For removal of the foreign body, after fixation of the fractures, an antrostomy of the left maxillary sinus was performed through the Caldwell-Luc access without lower meatal antrostomy to promote the drainage of all sinus content (Figure 2)[1, 8, 9].

The removed material had a hardened consistency, was firm to palpation, and was 2.4 cm in diameter, with a darkened coloration. After removal of the material within the maxillary sinus, a total sinusectomy was performed to remove all infected sinus mucosa[10]. After performing all the necessary sutures, postoperative medications, consisting of antibiotics (cepha-

ISSN 1983-5183

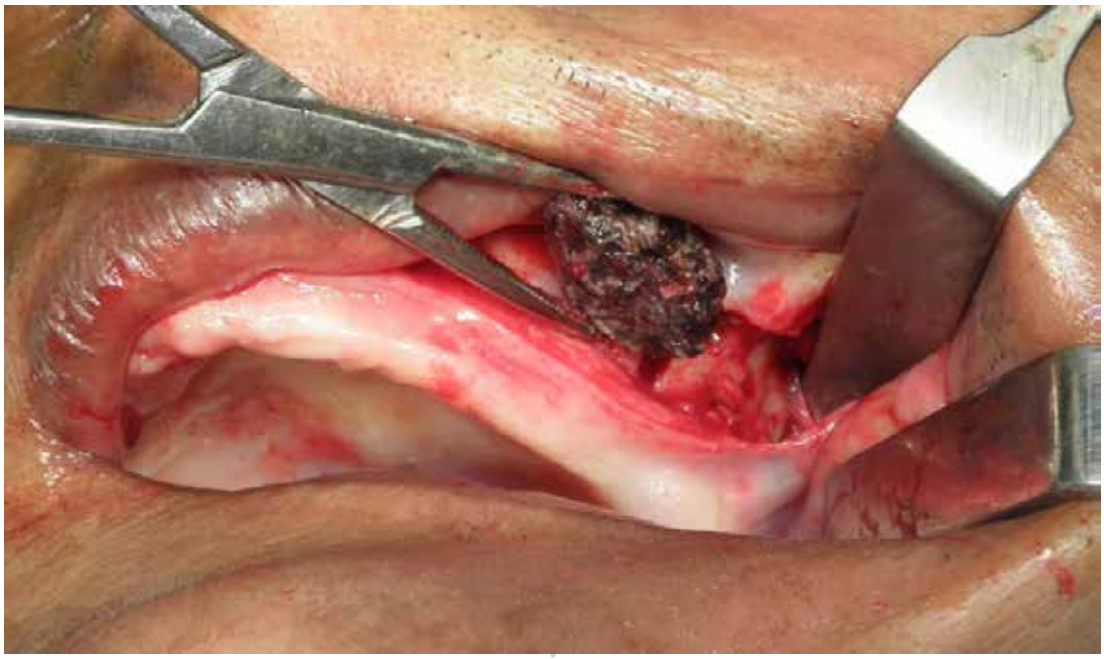

Figure 2 – *Calcified and blackened foreign body removed from the left maxillary sinus via Caldwell Luc access.*

losporin 1 gram intravenous (IV) every 6 hours), anti-inflammatory drugs (ketoprofen 100 mg, diluted in 100 ml of saline solution (SS) 0.9% 12/12 hours, dexamethasone 4 mg IV every 12 hours) and analgesics (dipyrone 500 mg diluted in 18 ml of SS 0.9%), were prescribed.

The foreign body was removed and threaded. The presence of a tooth root was detected in its interior (Figure 3). The clinical and surgical diagnosis of an antrolith caused by a piece of tooth root was suggested; the root was possibly released within the maxillary sinus with a probable evolution of 30 years. The material was sent for histopathological examination, which revealed amorphous eosinophilic material under basophilic lines of material deposition, which did not resemble cement or any dental or osteoid tissue (Figure 4), with the final diagnosis consistent with the diagnosis initially proposed.

DISCUSSION

The mucus produced within the maxillary sinus plays an important role as a protective colloid, and thus the presence of minerals are not found in high concen-

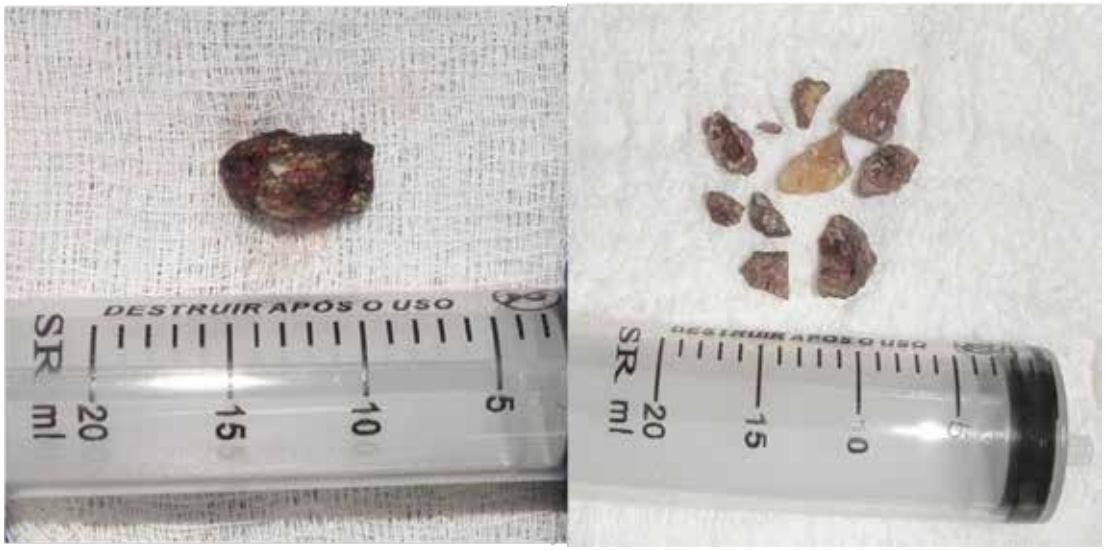

Figure 3 – *Fragmentation of the calcified foreign body, 2.4 cm in diameter, revealing the presence of a residual root within the calcification.*

ISSN 1983-5183

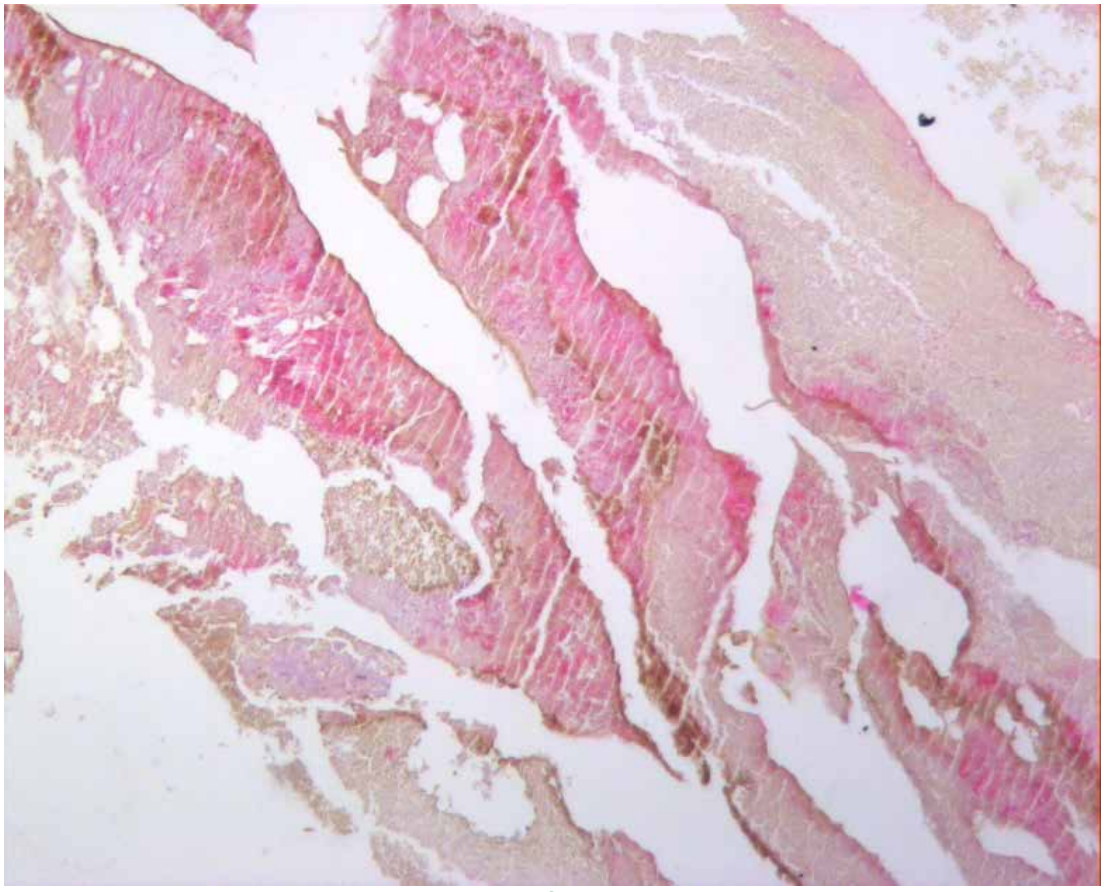

Figure 4 – *Histopathology showing amorphous eosinophilic material lines in the basophilic material deposition that do not resemble limestone, cement, or any dental or osteoid tissue.*

trations, even in an environment rich in calcium. However, the inflammatory process impedes ciliary movement and the barrier ability of the sinusal mucosa as it proceeds. These conditions can cause stasis in the mucosal secretions to modify the environment and encourage the concentration of inorganic salts[11]. The antrolith is formed from the successive deposition of minerals in the form of concentric rings around an FB into the sinuses[7]. The main components are calcium phosphate, calcium carbonate, organic matter and water[7,11,12].

The antroliths can be classified as true and false, depending on the aetiology. In the first case, their origin is endogenous and can be formed around blood, mucus, pus, red blood cells or leukocytes. Exogenous antrolith injuries are defined as false, and can develop around a foreign body, such as teeth, tooth roots, gauze, rocks, glass, paper, vegetables, beans, seeds, and even pearls of osseointegrated implants[6,11,13,14,15,16]. However, some authors consider that teeth or dental roots are endogenous causes[15,17,18] because they are constituent parts of the body.

The injury may have a variable consistency and be covered with a granulation tissue that has a rich blood supply; it may also vary in colour from black to grey or white. Some studies have shown that there is no gender or age predilection, and its symptoms can be variable. In some cases, patients may be asymptomatic, or they may report pain in the affected hemifacial or the frontal regions[7]. Facial pain, nasal obstruction, epistaxis, accumulation of purulent or bloody secretions are some of the signs and symptoms commonly associated with these calcareous masses in symptomatic cases. In cases with no symptomatology, the discovery of antroliths often happens accidentally after routine imaging exams[8,15,19].

Radiographically, antroliths are observed as radiopaque masses that vary in size and shape, with irregular borders, and they occasionally may be accompanied

ISSN 1983-5183

by sinus opacification caused by mucosal oedema, polyps and fluid. For the assessment of quality and precise location, at least two radiographic projections of the lesion or a computed tomography (CT) of the sinuses are recommended[18, 19].

In the differential diagnosis of radiopaque lesions of the maxillary sinus in imaging exams, antroliths may resemble osteomas, odontomas, ossifying fibromas, calcifying odontogenic cysts fibrosarcomas, teeth, aspergillosis, manifestations of fungal diseases, exostoses, radiopaque foreign bodies and inflammatory cysts[12, 20].

In a study conducted in 2003, 28 antroliths were reported from 1927 to 2002, demonstrating that these occurrences are rare[7]. In this study, the authors reported that 16 cases had a history of tooth extraction, which suggests an important role for dental procedures in the aetiology of antroliths.

Oroantral communication is mainly a complication of tooth extraction, which contaminates the sinus cavity with the microbiota of the oral cavity, resulting in the appearance of maxillary sinusitis[5, 14]. Several studies have demonstrated that odontogenic sinusitis is polymicrobial[21]. In the case presented, prophylactic antibacterial therapy was not performed, so the patient had no risk of sinus infection at surgery.

Studies have shown that approximately 91% of foreign bodies inside the maxillary sinus are the result of unsuccessful dental procedures, among which dental fragments, remnants of dental materials (amalgam dental fragments, extrusion of calcium hydroxide in the interior the root canal system) and osseointegrated implants can be found[19, 22, 23]. The objects most commonly released into the maxillary sinus are fractured roots or teeth[24]. The palatal root of the maxillary first molar is most commonly displaced to the maxillary sinus during an extraction procedure[24]. The penetration of foreign bodies into the interior of the paranasal sinuses during dental procedures may result from poor surgical planning and surgical inexperience.

In the case presented here, the presence of oroantral communication over approximately 30 years, associated with the tooth root within the maxillary sinus, allowed for the penetration of saliva, food residues and even probable accumulation of blood, which led to focal chronic maxillary sinusitis and the progressive growth of the calcareous mass. As the patient did not seek dental care to resolve his problem due to the lack of symptoms, the foreign body could only be identified and removed after its visualisation with a CT scan for diagnosis of the facial trauma.

The Caldwell-Luc access is a well-established procedure that promotes access to the jaws and is indicated for the removal of cysts and intra-sinus tumours, foreign bodies, oroantral fistula, osteonecrosis of the jaw, epistaxis control, fungal mycoses and facial trauma[10, 25]. In standard Caldwell-Luc access surgery, the lower meatal antrotomia (LMA) is typically held to promote postoperative drainage of the bloody content of the maxillary sinus. However, this procedure has been criticised because it induces another surgical wound and poses an additional risk of injury to the nasolacrimal duct. Although endoscopic sinus surgery is applied in some cases of sinusitis, there are still some cases in which the direct approach of the affected sinus is mandatory, as in cases of fistula, oroantral or intra-sinusal odontogenic lesions, or in the presence of large foreign bodies[1].

Surgical treatment of antroliths is indicated not only for the removal of the calcareous mass but also to promote proper treatment of the coexisting sinus disease[7, 26, 27, 28, 29]. A retrospective study was conducted with the results of Caldwell-Luc surgeries without LMA for the treatment of maxillary sinusitis of odontogenic origin during the period from 2004 to 2010. The authors concluded that this modification of the technique would provide a more comfortable postoperative period with a low probability of complications[9].

Histopathological examination confirmed the clinical suspicion of an antrolith, as the tooth root was observed to be associated with a large amount of calcareous material.

CONCLUSIONS

Antroliths are rare pathological conditions and should be taken into consi-

deration in the differential diagnosis of radiopaque paranasal injuries. The surgical approach by Caldwell-Luc access is a safe and effective procedure for the removal of the calcareous mass, as well as for the removal of associated sinusal mucosa and the restoration of normal sinus drainage and ventilation. A careful analysis of imaging tests may show changes that are not common, especially those found in the paranasal cavities, even if no clinical symptoms occur.

Conflict of interest

The authors declare that they have no conflict of interest.

REFERÊNCIAS

1. Han JK, Smith TL, Loehrl TA, Fong KJ, Hwang PH. Surgical revision of the post-Caldwell-Luc maxillary sinus. *Am J Rhinol* 2005 Sep-Oct;19(5):478-82.
2. Rodrigues MT, Munhoz ED, Cardoso CL, de Freitas CA, Damante JH. Chronic maxillary sinusitis associated with dental impression material. *Med Oral Patol Oral Cir Bucal* 2009 Apr;14(4):E163-6.
3. Shenoy V, Maller V. Maxillary antrolith: a rare cause of the recurrent sinusitis. *Case Rep Otolaryngol* 2013 2013(527152.
4. Liston PN, Walters RF. Foreign bodies in the maxillary antrum: a case report. *Aust Dent J* 2002 Dec;47(4):344-6.
5. Felisati G, Saibene AM, Lenzi R, Pipolo C. Late recovery from foreign body sinusitis after maxillary sinus floor augmentation. *BMJ Case Rep* 2012 2012(
6. Abuabara A, Cortez AL, Passeri LA, de Moraes M, Moreira RW. Evaluation of different treatments for oroantral/oronasal communications: experience of 112 cases. *Int J Oral Maxillofac Surg* 2006 Feb;35(2):155-8.
7. Nass Duce M, Talas DU, Ozer C, Yildiz A, Apaydin FD, Ozgur A. Antrolithiasis: a retrospective study. *J Laryngol Otol* 2003 Aug;117(8):637-40.
8. Al-Belasy FA. Inferior meatal antrostomy: is it necessary after radical sinus surgery through the Caldwell-Luc approach? *J Oral Maxillofac Surg* 2004 May;62(5):559-62.
9. Huang YC, Chen WH. Caldwell-Luc operation without inferior meatal antrostomy: a retrospective study of 50 cases. *J Oral Maxillofac Surg* 2012 Sep;70(9):2080-4.
10. Matheny KE, Duncavage JA. Contemporary indications for the Caldwell-Luc procedure. *Curr Opin Otolaryngol Head Neck Surg* 2003 Feb;11(1):23-6.
11. Ogata Y, Okinaka Y, Takahashi M. Antrolith associated with aspergillosis of the maxillary sinus: report of a case. *J Oral Maxillofac Surg* 1997 Nov;55(11):1339-41.
12. Henriques JC, Kreich EM, Rosa RR, Castilho JC, de Moraes LC, de Moraes ME. Noninvasive aspergillosis as a maxillary antrolith: report of a rare case. *Quintessence Int* 2012 Feb;43(2):143-6.
13. Irish LE, Gray RP, Sorenson FM. Antrolith. *Oral Surg Oral Med Oral Pathol* 1990 Nov;70(5):682-3.
14. Guler N, Duygu G. Progressive swelling and radiopaque mass in maxillary sinus: formation of stone. *Kulak Burun Bogaz Ihtis Derg* 2012 May-Jun;22(3):181-5.
15. Manzi F, Tuji F, Halter Neto F, Almeida S. Antrólito maxilar observado em paciente assintomático: revisão de literature e relato de caso clínico. *Rev Odontol Brasil Central* 2001 10(29):17-9.
16. Sofat JR, Greval RS. Maxillary antrolith around tooth root tip with oro-antral fistula--a case report. *J Indian Dent Assoc* 1985 Jun;57(6):227-9.

17. Ishiyama T. Maxillary antrolith: report of a case. *Auris Nasus Larynx* 1988 15(3):185-9.

18. Pokorny A, Tataryn R. Clinical and radiologic findings in a case series of maxillary sinusitis of dental origin. *Int Forum Allergy Rhinol* 2013 Dec;3(12):973-9.

19. Guneri P, Kaya A, Caliskan MK. Antroliths: survey of the literature and report of a case. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2005 Apr;99(4):517-21.

20. Langerman A, Sigari F, Naclerio R. Calcified maxillary cyst secondary to a foreign-body reaction at the site of a remote tooth extraction. *Ear Nose Throat J* 2010 Jan;89(1):42-3.

21. Mehra P, Jeong D. Maxillary sinusitis of odontogenic origin. *Curr Allergy Asthma Rep* 2009 May;9(3):238-43.

22. Agustí EB, Puiggrós IV, Figuerola CR, Vecina VM. Cuerpos extraños en seno maxilar. *Acta Otorrinolaringológica Española* 2009 June;60(3):190-3.

23. Tabrizi R, Amid R, Taha Ozkan B, Khorshidi H, Langner NJ. Effects of exposing dental implant to the maxillary sinus cavity. *J Craniofac Surg* 2012 May;23(3):767-9.

24. Aguiar RC, Silva Júnior AN, Hernandez PAG, Pinto JG, Ciprandi MTO, Gassen HT. Remoção cirúrgica de um instrumento deslocado acidentalmente para ointerior do seio maxilar durante a instalação de implantes. *RFO UPF* 2007 set.-dez.;12(3):65-8.

25. Barzilai G, Greenberg E, Uri N. Indications for the Caldwell-Luc approach in the endoscopic era. *Otolaryngol Head Neck Surg* 2005 Feb;132(2):219-20.

26. Cohen MA, Packota GV, Hall MJ, Steinberg J. Large asymptomatic antrolith of the maxillary sinus. Report of a case. *Oral Surg Oral Med Oral Pathol* 1991 Feb;71(2):155-7.

27. Orhan K, Kocyigit D, Turkoglu K, Kartal Y, Arslan A. Illosis of maxillary sinus in immunocompromised patient. Case report. *N Y State Dent J* 2012 Jan;78(1):46-9.

28. Wu CW, Tai CF, Wang LF, Tsai KB, Kuo WR. Aspergillosis: a nidus of maxillary antrolith. *Am J Otolaryngol* 2005 Nov-Dec;26(6):426-9.

29. Nair S, James E, Dutta A, Goyal S. Antrolith in the maxillary sinus: an unusual complication of endoscopic sinus surgery. *Indian J Otolaryngol Head Neck Surg* 2010 2010/01/01;62(1):81-3.

Recebido em 19-11-2013

Aceito em 02-12-2013