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## Idiopathic bilateral antral exostoses: A rare case in maxillary sinus

Eduardo Borie<sup>a,b,\*</sup>, Plauto C.A. Watanabe<sup>b</sup>, Iara A. Orsi<sup>b</sup>, Ramón Fuentes<sup>a</sup><sup>a</sup> Dental School, Universidad de La Frontera, Temuco, Chile<sup>b</sup> Ribeirão Preto Dental School, University of São Paulo, Ribeirão Preto, SP, Brazil

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## ABSTRACT

**INTRODUCTION:** Exostoses in paranasal sinuses have been reported in the otolaryngology literature, but they have not been described in the dental literature to our knowledge. The aim of this article is to describe an idiopathic and rare case of bilateral exostosis obtained by cone-beam computed tomography.

**PRESENTATION OF CASE:** The case shows a healthy and asymptomatic patient with a different size and form of exostoses in both maxillary sinuses.

**DISCUSSION:** It is difficult to clinically diagnose the antral exostosis due the asymptomatic nature of this condition, unless the approach would be through endoscope. Sometimes this condition is related with nasal irrigants, however in this case the patient asserted not having used nasal irrigation ever; thus, it is impossible to relate this kind of treatment as a principal cause.

**CONCLUSION:** The published data of exostoses in maxillary sinus seem to be limited in the dental literature, and this condition is important to consider in an implant treatment planning. Also, it is important to perform a follow-up of the cases in trying to find the possible causes of exostosis.

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## 1. Introduction

Maxillary sinuses exhibit significant anatomic structures that are important to assess prior to implant placement.<sup>1,2</sup> However, the implant treatment could be modified by some findings in maxillary sinus such as pneumatization, hypoplasia, antral septa, and exostosis.<sup>3</sup> Ohba et al.,<sup>4</sup> in a radiology forum, reported an incidence of maxillary sinus exostosis in 0.9% of the 2196 panoramic radiographs studied, being all of them unilateral cases, with predominance in the airway area and in female individuals. The same authors<sup>4</sup> stated that no information about the origin of exostosis was found, but recently, some authors have related exostosis cases in patients with nasal irrigation treatment, correlating cold temperature with a possible exostosis beginning.<sup>5–8</sup> Panoramic radiograph is a low-cost imaging method to assess the size, pneumatization, and findings of maxillary sinus. This radiograph is used routinely in the first examination of patients because it is simple, has low radiation exposition, and allows the observation of different kinds of findings in the maxillary sinus as in other structures.<sup>9</sup> Unfortunately, panoramic radiograph may not be as reliable and accurate method for diagnosing pathological dental or sinus findings as three-dimensional imaging techniques.<sup>10</sup> In fact, advances in the computed tomography software have made the imaging of the paranasal sinuses precise and easy to assess, allowing much greater

depiction and resolution of the structures.<sup>11</sup> Furthermore, the cone-beam computed tomography (CBCT) should be considered as an important diagnostic image for dental practice.<sup>3</sup>

Exostoses in paranasal sinuses have been widely reported in the otolaryngology literature,<sup>5–8</sup> but they have not been described in the dental radiology literature to our knowledge. The aim of this article is to describe an idiopathic and rare case of bilateral exostosis obtained by cone-beam computed tomography.

## 2. Presentation of case

A 49-year-old male patient, partially edentulous, without relevant background in medical history, was admitted for rehabilitation through dental implants. The patient reported that the absence of some teeth was related with dental caries and not by periodontal disease. Bilateral exostoses in both maxillary sinuses were identified in a control panoramic radiograph (Fig. 1). Through three-dimensional imaging by cone-beam computed tomography, the shape, size, and location of both exostoses in each maxillary sinus were observed. At the right side, a pedicled exostosis was observed in maxillary sinus (Fig. 2), over the sinus floor, at first molar level. Also, a root fragment was identified in the cone-beam images in relation with the exostosis area. The maximum thickness was 6.3 mm, with 9.8 mm of maximum height (Fig. 3). The shape was like a mushroom with a large pedicle in its base of 4.7 mm and 7.3 mm at the top. Its entire contour was corticalized. At the left side, an irregular and corticalized exostosis was identified (Fig. 4), with its origin between the boundary of anterior wall and sinus

\* Corresponding author at: Dental School, Universidad de La Frontera, Manuel Montt #112, Postal code: 4781176, Temuco, Chile. Tel.: +56 45 325775.  
E-mail address: [eduardo.borie@ufrontera.cl](mailto:eduardo.borie@ufrontera.cl) (E. Borie).



Fig. 1. Panoramic radiograph with both exostoses.

floor. Exostosis extension at the left side was from the first premolar until the second molar region. The shape was irregular and with a broad base of 10.3 mm at the bottom and 11.9 mm at the top, with a total length of 18 mm, maximum height of 15.4 mm, and thickness of 9.4 mm (Fig. 5). The patient had not reported any symptoms of pain, discomfort, or signs of sinus inflammation. The patient asserted that he had not undergone sinus or nasal surgery and he had no history of recurrent sinus infection. The individual also reported not having used nasal irrigation treatment ever in his life. Finally, the patient was referred to an otolaryngologist, refusing an endoscope observation as well as biopsy.

3. Discussion

The increasing use of CBCT in dental area has improved the assessment of relevant findings in the craniofacial area.<sup>1</sup> CBCT avoids an image overlap, enlargement, and distortion, allowing a more accurate three-dimensional view of dental and maxillofacial structures.<sup>12</sup> Authors like Lana et al.,<sup>3</sup> concluded that CBCT is a very useful diagnostic tool in dentistry to identify anatomical variations and maxillary sinus injuries. Frequently, it is possible to observe incidental findings in maxillary sinus, including bone alterations, mucosal thickness, fluid levels, and the position and shape of ostium, among others.<sup>1</sup> In a study by Gracco et al.,<sup>12</sup> it was found that of the 513 CBCT images obtained for orthodontic diagnoses, 50.3% of patients presented maxillary sinus findings,

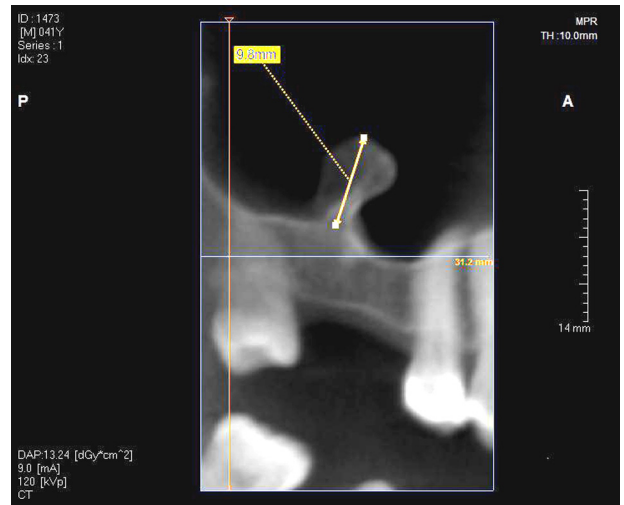


Fig. 3. Height measurement of antral exostosis at right side.

38.8% being bilateral cases. In a study by Ritter et al.,<sup>1</sup> 1029 patients were evaluated, and 56.3% of the patients showed maxillary sinus findings in at least one sinus, with 27.2% of cases having both sinuses involved. However, most studies in the literature used imaging to assess the changes in mucosal thickness<sup>13–15</sup> but without reporting exostosis findings in the maxillary sinus.

Ohba et al.,<sup>4</sup> stated that it is important to identify and radiographically diagnose this condition to avoid unnecessary surgical procedures. It is difficult to clinically diagnose because of the asymptomatic nature of this condition, unless the approach would be through endoscope. Although there exists little information about antral exostoses, some features were described by Ohba et al.<sup>4</sup> The mean size reported by these authors (4.7 mm × 7.4 mm) was clearly lower than both individual exostoses, even exceeding the highest measure of the cases presented (8 mm × 13 mm). At the right side, the shape base was according to the narrow base or “mushroom-like shape” description of Ohba et al.<sup>4</sup> Nevertheless, at the left side, the shape base was similar to the broad shape description. The location of the exostosis was at the sinus floor level at the right side and at the boundary of anterior wall and sinus floor at the left side. Some authors<sup>4</sup> reported that 55% of exostosis location was related with sinus floor and 10% with the boundary of

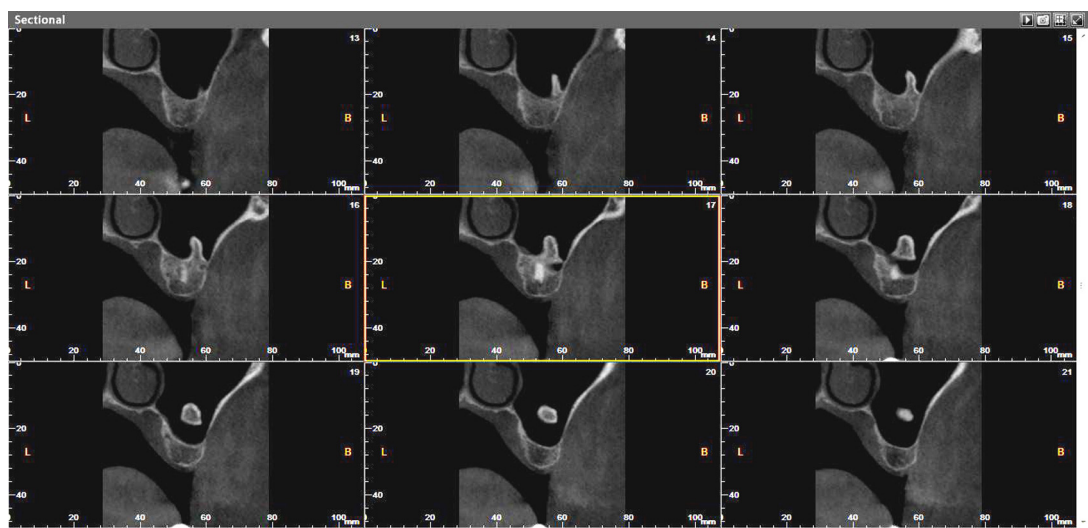


Fig. 2. Cone-beam image showing cuts of 1 mm at right side. Note the premolar root fragment in the central cut.

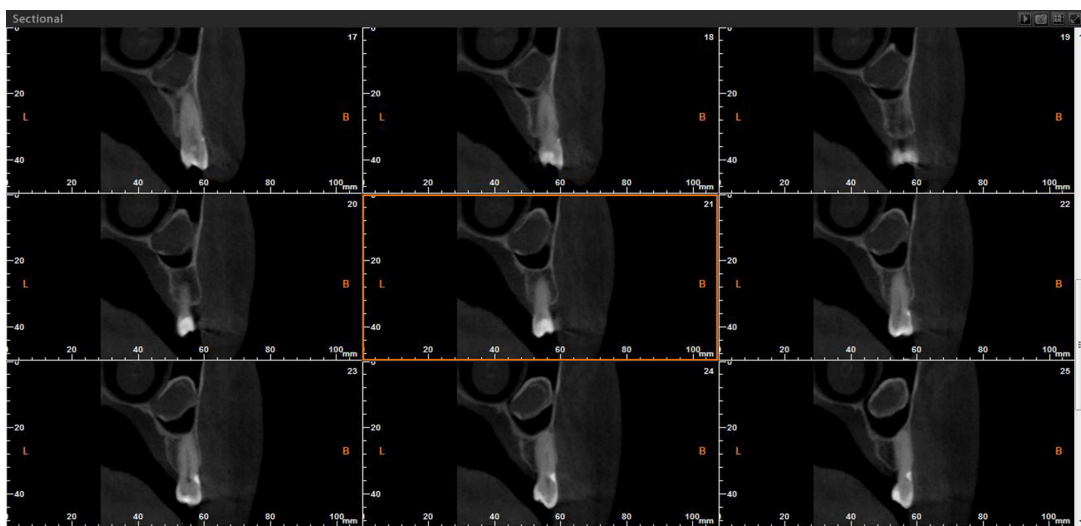


Fig. 4. Cone-beam image showing cuts of 1 mm at left side. Note the greater size when compared with left side exostosis.

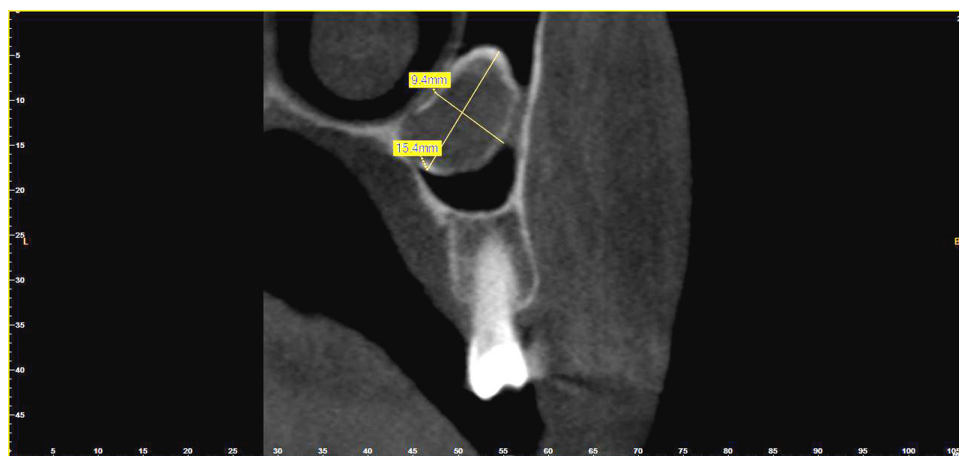


Fig. 5. Height and width measurement at left side.

anterior and medial walls. It is important to point out that all the cases reported by Ohba et al.,<sup>4</sup> were unilateral findings and, in this patient, involved both sinuses.

Recently, many cases of exostosis in sinuses have been reported in the otolaryngologist literature, which are suspected to be the main cause of having cold nasal irrigants. Haffey et al.,<sup>6</sup> reported six cases of paranasal exostosis in ethmoidal and maxillary sinuses, all patients presenting the same features: all cases underwent paranasal surgery, without previous findings of this condition in tomography or endoscopic examination, and were asymptomatic. Also, all the nasal irrigants were kept in the refrigerator. The same features were observed in the cases published by other authors.<sup>7,8</sup> However, in the case presented here, the patient asserted not having used nasal irrigation ever; thus, it is impossible to relate this kind of treatment as a principal cause. It is important to point out that none of the cases in the literature required surgical removal, which was the same as in this case. Adelson and Kennedy<sup>8</sup> stated that paranasal exostoses seem to have no clinical significance while not obstructing the sinus. In most cases, only a clinical follow-up of the patient supplemented with imaging is necessary to control the antral exostoses during the time.

Generally, biopsy is not recommended but could be useful in cases when patient has inconsistent history or non-characteristic-appearing lesions.<sup>6</sup> Unfortunately, the individual's cooperation did

not help in the examination using endoscopic approach or biopsy, and a follow-up of the case was not allowed. Patient history and the little information in the literature did not pave the way for the inquiry of possible causes of exostosis, and exostosis was, therefore, considered as idiopathic.

#### 4. Conclusion

Despite the common incidental findings in maxillary sinus, the published data of exostoses in maxillary sinus seem to be limited in the dental literature, and it should be emphasized that while the dentist is not going to treat this type of condition if it is beyond his expertise, he has the responsibility to diagnose this kind of findings for proper referral to a specialist. Moreover, if the patient cooperates, it is very important to perform a case follow-up for this kind of exostosis because maxillary sinus is an atypical location.

#### Conflict of interest

None.

#### Funding

None.

**Ethical approval**

None.

**Author Contributions**

Eduardo Borie: Obtained consent and written the entire case, performing the literature review.

Plauto C. Watanabe: Performed the cone-beam tomography analysis. Edited the manuscript.

Iara A. Orsi: Performed the literature research, reviewing and editing the manuscript.

Ramón Fuentes: Receiving the patient, detecting bilateral exostosis. Directed the anamnesis and questionnaires to the patient. Help to edit the manuscript.

**Consent**

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request

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