

INCIDENTAL FINDINGS IN ORTHOPANTOMOGRAM A RETROSPECTIVE CROSS-SECTIONAL STUDY

Shilpa Syam¹, T. N. Uma Maheswari^{2*}

1. *2nd Year Post-Graduate Student, Saveetha Dental College, Department of Oral Medicine and Radiology, SIMATS, Chennai, India.*
2. *Professor, Saveetha Dental College, Department of Oral Medicine and Radiology, SIMATS, Chennai, India*

ARTICLE INFO

Received:

27th Mar 2019

Received in revised form:

14th Aug 2019

Accepted:

22th Aug 2019

Available online:

21th Oct 2019

ABSTRACT

Aim: To study the prevalence of various incidental findings in the maxillofacial region using orthopantomograms (OPG). **Materials & Methods:** 70 OPGs were obtained from the Oral Radiology Department of a dental hospital and assessed for incidental findings unrelated to routine dental complaints. **Result:** Most prevalent incidental finding in OPG was maxillary sinus haziness followed by impacted maxillary canines. **Conclusion:** Patients can visit the dentist for orofacial pain, which could be related to maxillary sinus pathologies. Hence, clinicians should consider non-odontogenic aetiologies for pain in the orofacial region.

Copyright © 2013 - All Rights Reserved - Pharmacophore

Keywords: Incidental, OPG, orthopantomogram, prevalence, findings

To Cite This Article: Syam S, Uma Maheswari T. N., (2019), Incidental findings in orthopantomogram – a retrospective cross-sectional study. *Pharmacophore*, 10(5), 1-4.

Introduction

Incidental findings of pathologies in radiology refer to occult abnormalities that show no clinical signs nor symptoms but were detected in radiograph taken for some other purposes or an unrelated chief complaint. [1] In dentistry, these may include tooth related or intraosseous findings. Some of these findings may have significant consequences on the patient's health. Hence, a radiologist should not confine the focus on one particular region of the film/ image.

Panoramic radiographs allow visualization of calcified atherosclerotic plaques that get deposited in carotid arteries. [2, 3] Atherosclerosis is a potentially life-threatening chronic disease marked by loss of elasticity and atheromatous plaque accumulation in arterial walls. [3] Risk factors include diabetes mellitus, hypertension, improper diet, and sedentary lifestyle. In OPGs atheromas appear as single to multiple, irregular radiopaque structures located approximately 2.5 cm posteriorly and inferiorly to the mandibular angle and next to the region between C3 and C4. [4] They may be unilateral or bilateral. [5] The prevalence in the general population is reportedly 3-5%. [6]

Tonsilloliths occur following chronic inflammation of tonsils. They are formed by dystrophic calcification. [7] Formed within the tonsillar crypt, these usually involve palatine tonsil and produce non-specific symptoms like chronic halitosis, cough, dysgeusia, and otalgia. Sometimes the individual is asymptomatic and the finding is incidental on the radiograph. [8] They mostly occur as single and unilateral, but multiple bilateral presentations are not uncommon. [9] Tonsilloliths are usually small in size, varying from a few millimeters to several centimeters, and made up of calcium salts, magnesium salts and ammonium radicals derived from the secretions of salivary glands. Exact etiology and pathogenesis are unclear.

The maxillary sinus maintains its dimensions, unless with advancing age or following loss of posterior teeth. This process is called pneumatization. It can be seen as a result of atrophy due to reduced occlusal function. MSP in an OPG appears as teeth roots protruding into sinus with a thin cortical bone lining. Non-pathogenic pneumatization of sinus toward alveolar ridge occurs physiologically till ridge development completion nearly at twenty years old as reported by Misch et al. There are no evident reasons for MSP after full alveolar development other than tooth loss. Maxillary sinus pneumatization (MSP) is found to be dependent on age, gender, and ethnicity. [10]

Other abnormalities of the maxillary sinus which may be asymptomatic like haziness, mucosal thickening, retention cysts, and polyps can also be incidental findings in dental radiographs. Panoramic radiographs although aid in the diagnosis of these pathologies in both symptomatic and asymptomatic cases, but show poor sensitivity for lesions with diameter less than 3 mm. Maxillary sinus may appear opacified due to mucocele, sinonasal polyposis, cyst, neoplasms or sick sinus syndrome. The maxillary sinus can appear hazy in cases of sinonasal inflammatory disease due to sino-ostial obstruction or in chronic sinusitis. Acute sinusitis will present with an air-fluid level. Yet, a clinical dilemma exists, whether to consider clinically asymptomatic cases with haziness on radiographs as sinusitis or not. [11]

Calcified lymph nodes may be identified on OPGs inferior to the angle of the mandible. A history of successfully treated tuberculosis infection or any other prior chronic infection of the lymph nodes can result in calcification. Usually asymptomatic, it may involve a single node or a chain of nodes. [12]

Max canine impaction is a common clinical problem and it is the most frequently impacted tooth after the third molars. Ericson et al reported an incidence of 1.7%. [13] Exact localization of the unerupted canines can aid in predicting the feasibility, and appropriate access for surgical approach along with the right direction for application of orthodontic force.

Given the importance of such findings, the aim of this study was to study the prevalence of various incidental findings in the maxillofacial region using OPGs.

Materials and Methods

Seventy OPGs of random patients were obtained from the oral radiology department of a dental hospital. The images were retrospectively analyzed for any pathologies unrelated to common dental complains like malocclusion, missing, carious or fractured teeth, impacted maxillary and mandibular third molars, and periodontitis. Odontogenic abscesses, cysts, and tumors were also excluded. There were no age or gender restrictions.



a. Excess pneumatization of the maxillary sinus.



b. Impacted maxillary canines.



c. Retention cyst of maxillary antrum.



d. Calcified lymph nodes.

Figure 1: Common incidental findings in an OPG

Results

Eighteen out of the seventy OPGs assessed were found to have seven incidental findings namely maxillary sinus haziness, excess pneumatization of the maxillary sinus (MSP), tonsillolith, impacted maxillary canine, retention pseudocyst, calcified submandibular lymph node, and CAC. Out of these, 11 were males and 7 were females.

Table 1: Prevalence of incidental findings among males and females

Incidental Finding	Number	Males	Females	Prevalence
	n	n	n	%
Maxillary sinus haziness	6	5	1	33.33%

Excess pneumatization of maxillary sinus	3	2	1	16.66%
Tonsillolith	1	0	1	5.56%
Impacted maxillary canine	4	2	2	22.22%
Retention pseudocyst/ Polyp	2	0	2	11.11%
Calcified submandibular lymph node	1	1	0	5.56%
CAC	1	1	0	5.56%
Total	18	11	7	

Prevalence of Incidental Findings in Opg

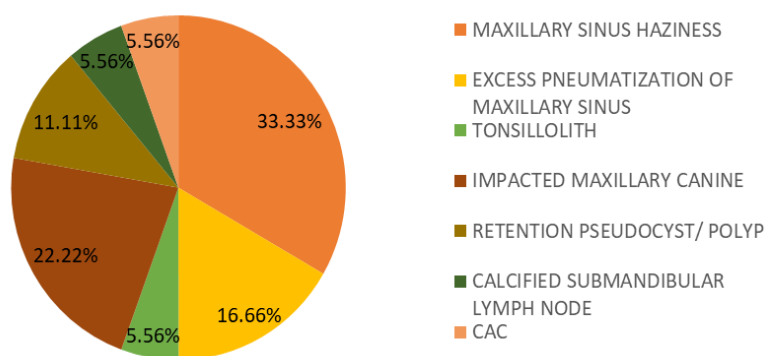


Figure 2: Prevalence rates of various incidental findings in OPG

Discussion

Our study showed a high prevalence of maxillary sinus pathologies in OPGs, with maxillary sinus haziness being the highest reported incidental finding followed by excess pneumatization of the maxillary sinus. Dau and colleagues compared panoramic radiography with cone-beam computed tomography in the detection of symptomatic maxillary sinus pathologies and reported the detection of several additional incidental findings in OPGs, highlighting its value as a diagnostic tool. Additionally, the study revealed that most of the findings were discovered by senior surgeons rather than young dentists demonstrating the need for experience in radiodiagnosis for detection of chance occurrences. [11] Sharan and Majdar studied MSP between dentulous and edentulous sides of patients on panoramic radiographs, suggesting a greater pneumatization in multiple extraction sites in the posterior region. [14] Furthermore, sinus pneumatization was identified following extraction of maxillary posterior teeth. In our study also all the cases of MSP were associated with extracted maxillary posteriors. Moreover, Farina and colleagues concluded that the maintenance of a single posterior tooth can prevent significant pneumatization, and loss of even one tooth can cause an evident down-growth. [15] In dentulous patients, MSP should raise awareness and caution among oral surgeons and implantologists to minimize surgical complications such as oro-antral communication.

Tonsilloliths are more prevalent in adults between the age group of 20-60 years and are rare in children. In a review done by Mesolella and colleagues, the prevalence of tonsilloliths based on the sites were studied. The results revealed that the most common location is tonsillar tissue (69.7%), followed by tonsillar fossa (21.2%), and palatine tonsil (9%). [16] In our study, tonsilloliths showed a prevalence of 5 % which was similar to the study by Babu et al. who reported that tonsilloliths may be discovered on panoramic radiographs as incidental findings in 5% of cases, and that these should be the first differential diagnosis for multiple ill-defined radiopaque bodies located on palatal uvula and ramus in an OPG. [8]

In the present study, only one case indicated the presence of atheromas. In a previous study, 29 out of 83 panoramic radiographs assessed were found to have atheromas. [8] The main differential diagnosis for CAC in OPG is the triteceal cartilage. Since atherosclerosis can lead to myocardial infarctions and cerebrovascular accidents, in cases of detection or suspicion of the presence of CAC, a dentist must refer the patient immediately to a physician.

Garay et al. assessed 3,028 digital panoramic radiographs, which revealed a total of 79 soft tissue calcification, 4% of which were lymph node calcifications compared to 5.56% in our study. [13] Katsnelson et al. reported OPGs to have high specificity and sensitivity for identifying impacted maxillary canine position, and in our study, it was the fourth most prevalent incidental finding. [17]

Conclusion

Since the number of findings associated with maxillary sinus abnormalities was more in this dental hospital-based study, we can infer that a good number of patients visiting the dentist for apparent toothache may have acute/chronic sinusitis resulting in orofacial pain. Hence, the dentist evaluating the OPG should assess the entire image in a systematic manner. Any

significant underlying pathology or relevant incidental finding should be reported, and the patient should be duly referred to an ENT or a general physician for further management.

References

1. Goyal G, Padda S, Kaur B. Unusual incidental findings on intra-and extra-oral radiographs in North Indian Population: A radiographic study. *Journal of Dental and Allied Sciences*. 2016 Jul 1;5(2):74.
2. Henriques JC, Kreich EM, Baldani MH, Luciano M, de Melo Castilho JC, de Moraes LC. Panoramic radiography in the diagnosis of carotid artery atheromas and the associated risk factors. *The open dentistry journal*. 2011;5:79.
3. Ramadurai J., Umamaheswari T. N. The Prevalence of oral and maxillofacial soft tissue calcifications in dental panoramic radiography: A retrospective study. *International Journal of Maxillofacial Imaging*, 2018;4(3):82-86.
4. Head T, Daunert S, Goldschmidt-Clermont PJ. The aging risk and atherosclerosis: a fresh look at arterial homeostasis. *Frontiers in genetics*. 2017 Dec 14;8:216.
5. Yoon SJ, Yoon W, Kim OS, Lee JS, Kang BC. Diagnostic accuracy of panoramic radiography in the detection of calcified carotid artery. *Dentomaxillofacial Radiology*. 2008 Feb;37(2):104-7.
6. Sisman Y, Ertas ET, Gokce C, Menku A, Ulker M, Akgunlu F. The Prevalence of Carotid Artery Calcification on the Panoramic Radiographs in Cappadocia Region Population. *European journal of dentistry*. 2007 Jul;1(3):132.
7. Taheri JB, Moshfeghi M. Prevalence of calcified carotid artery on panoramic radiographs in postmenopausal women. *Journal of dental research, dental clinics, dental prospects*. 2009;3(2):46.
8. Balaji Babu B, Avinash Tejasvi ML, CK AA, Chittaranjan B. Tonsillolith: A panoramic radiograph presentation. *Journal of clinical and diagnostic research: JCDR*. 2013 Oct;7(10):2378.
9. Barghan S, Tahmasbi Arashlow M, Nair MK. Incidental findings on cone beam computed tomography studies outside of the maxillofacial skeleton. *International journal of dentistry*. 2016.
10. Chan J, Rashid M, Karagama Y. An unusual case of a tonsillolith. *Case reports in medicine*. 2012.
11. Dau M, Marciak P, Al-Nawas B, Staedt H, Alshiri A, Frerich B, Kämmerer PW. Evaluation of symptomatic maxillary sinus pathologies using panoramic radiography and cone beam computed tomography—influence of professional training. *International journal of implant dentistry*. 2017 Dec;3(1):13.
12. Gujrathi A, Wakode PT. Haziness in X-Ray paranasal sinus water's view in sinusitis: a fact or fiction. *Indian Journal of Otolaryngology and Head & Neck Surgery*. 2013 Aug 1;65(2):242-6.
13. Garay I, Netto HD, Olate S. Soft tissue calcified in mandibular angle area observed by means of panoramic radiography. *International journal of clinical and experimental medicine*. 2014;7(1):51.
14. Sharan A, Madjar D. Maxillary sinus pneumatization following extractions: a radiographic study. *International Journal of Oral & Maxillofacial Implants*. 2008 Jan 1;23(1).
15. Farina R, Pramstraller M, Franceschetti G, Pramstraller C, Trombelli L. Alveolar ridge dimensions in maxillary posterior sextants: a retrospective comparative study of dentate and edentulous sites using computerized tomography data. *Clinical Oral Implants Research*. 2011 Oct;22(10):1138-44.
16. Mesolella M, Cimmino M, Di Martino M, Criscuoli G, Albanese L, Galli V. Tonsillolith. Case report and review of the literature. *Acta Otorhinolaryngol Ital*. 2004 Oct;24(5):302-7.
17. Katsnelson A, Flick WG, Susarla S, Tartakovsky JV, Miloro M. Use of panoramic x-ray to determine position of impacted maxillary canines. *Journal of Oral and Maxillofacial Surgery*. 2010 May 1;68(5):996-1000.