



THE IMPORTANCE OF IMMUNOLOGICAL FINDINGS IN THE IDENTIFICATION OF HEAD AND NECK PATHOLOGICAL CHANGES: A LITERATURE REVIEW

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ABSTRACT

Introduction: Radiography serve as an aid for professional and is a primary factor in obtaining more accurate diagnoses, as well as immunological findings diagnosing diseases early. **Objective:** Given the importance of these tests, this paper aims to analyze the importance of imaging findings in the identification of pathological changes of the head and neck. **Methodology:** For this, a literature review based on literature by consulting the scientific articles selected by searching the PubMed database was performed, Lilacs and Bireme, besides the assets of the College Northeast Independent Library. Being selected 26 articles, of the last 15 years that had relation with the subject approached. **Discussion:** Dentists should have an overview of the maxillofacial structures, and to identify changes not directly related to dentistry, which further enhances its utility and indication for other operating areas. **Conclusion:** This professional has the ability to identify changes to the head-neck complex views on radiographs and the duty to refer these patients to a specific medical treatment preventing possible complications.

KEYWORDS: Dental Radiography. Panoramic Radiography. Diagnostic by Image.

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INTRODUCTION

The X-ray was discovered in 1895 by Wilhelm Conrad Rontgen and since then radiographic examinations have undergone great advances in Dentistry and its use has been increasingly important for the diagnosis of asymptomatic oral diseases. These can be classified in Dentistry as intraoral and extraoral, analog and digital.

Radiographs are a valuable aid in the diagnosis and complement of clinical examination of pathologies. Because they are two-dimensional, they have some limitations, three-dimensional ones have been developed, such as computed tomography beam, magnetic resonance and ultrasound. The correct use of radiographic techniques can help in the early detection of several

head and neck diseases as well as dental diseases.

Immunological exams should serve as an auxiliary means for the professional and is a prime factor in obtaining more accurate diagnoses. Occlusal radiographs, panoramic and computerized tomography radiographs have played an important role both in the clinical life and in the aid of the findings

of alterations and pathologies of head and neck.

Among several immunological findings, we can highlight sialolites, atherosclerotic lesions, nasal septum deviation, stylohyoid ligament calcifications, stretching of the styloid process, tonsiloliths, oral-sinusal communication, sinusitis, Eagle syndrome and calcification of cricoid cartilage. These are found in routine radiographic examinations, or by indications of dental specialties, such as Orthodontics and Implantodontics.

Considering the difficulty of some professionals in the detection of these alterations, the present study searches through a literature review to analyze the importance of the imaging findings in the identification of the pathological alterations of the head and neck. Highlighting the main imaging, alterations and pathological findings in the areas of reach of the dental bundles. Thus, this study aims to analyze the importance of immunological findings in the identification of pathological changes of the head and neck.

METHODOLOGY

This study is a literature review based on scientific articles on the Importance of Immunological Findings in the Identification of Pathological Alterations of the Head and Neck. Were searched researchs which are related with the diagnosis of pathologies by means of radiographic examinations, used in dentistry, especially panoramic radiography. The following databases were used to search the articles: PubMed, Lilacs, Bireme; and the collection of the Independent Faculty Library of the Northeast. Scientific articles, abstracts, monographs, theses and books referring

to the last 15 years were searched using the following descriptors: "Dental radiography"; "Panoramic Radiography"; "Diagnostic by image". 26 articles were selected for the preparation of this project, which served as the basis for a review of classical literature focusing on the objective of the present study.

LITERATURE REVIEW

SIALOLITHS

Sialoliths, also known as salivary calculus or sialolithiasis, are calcified structures that develop in the salivary duct system. It is caused by the deposition of calcium salts around focal areas of organic matter, and their size varies from 1 to 10mm. They present as obstruction and increase of volume of the affected duct, reduction of salivary flow and occasional painful symptomatology. The submandibular gland and its duct appear to be the sites most susceptible to this disease, followed by the parotid gland and finally the sublingual gland.

Ferreira and Manzi (2010) reported that the symptomatology of sialolite varies according to the intensity and degree of obstruction of the gland. When salivary calculi are small, there is no symptomatology. Thus, this pathology is a radiographic finding, seen as a radiopaque mass and radiolucent calculations can be found. Thus, it is necessary to inspect, palpate and verify the quantity and quality of secreted saliva to close an accurate diagnosis.

This clinical situation can be observed in panoramic, occlusal and periapical radiographs; computed tomography; sialography; ultrasonography; scintigraphy; magnetic resonance imaging and

endoscopy^{5,6}. In the panoramas, they can be seen superimposed on the body, branch or below the mandible, anterior to the calcifications of the carotid artery.

There are several methods available for your treatment, depending on the affected gland, size and location of the calculation, however, regardless of technique, you should opt for the most conservative method possible.

ATHEROSCLEROTIC LESIONS

Is considered the most serious of the pathologies, atherosclerotic lesions can be seen on the panoramic and lateral cephalometric radiographs, which can cause a stroke, often asymptomatic but with a very early diagnosis. Considered to be the most serious of the pathologies, atherosclerotic lesions can be seen on the panoramic and lateral cephalometric radiographs, which can cause a stroke, often asymptomatic but with a very early diagnosis. Calcifications are located in the cranial or carotid arteries and are most commonly identified on panoramic radiographs in the region of the space between the cervical vertebrae 3 and 4 (C3 and C4), presenting as single or multiple irregular masses.

The identification of the calcified plaques in the carotid region by the Dentist may be fundamental. It should be noted that panoramic radiography is a complementary examination widely used for evaluation and treatment plan, which may assist in the early diagnosis of a more serious injury that may cause harm to the patient's health. However, the correct diagnosis of this lesion on the panoramic radiograph and the conduct in relation to the patient still represent a challenge in dental practice.

ODONTOGENIC SINUSITIS

Sinusitis, known as generalized inflammation of the paranasal sinus mucosa. The etiologic agent may be allergic, bacterial, fungal or viral. Odontogenic sinusitis accounts for approximately 10% to 12% of cases of maxillary sinusitis.

In radiographic examinations, such as concomitant computed tomography (CT), the maxillary sinus, which has a rounded or oval shape, presents as a radiolucent area with a radiopaque layer around it, thanks to the presence of air inside it in natural conditions. However, in the presence of maxillary sinusitis, the image becomes partially or totally radiopaque, due to the presence of mucous thickening of the maxillary sinus.

The importance of imaging examinations complementing the physical examination during the diagnostic process and the elucidation of the pathogenesis of sinus diseases are minimized to minimize ineffective treatments and damages to individuals.

STYLE-HYOID LIGAMENT CALCIFICATIONS

The stylohyoid ligaments extend after the styloid process to the hyoid bone, may mineralize or ossify from this ligament, and may be asymptomatic. Jácome and Abdo (2009) argue that panoramic radiographs are best for viewing as they may present radiographically long, tapered, thin, radiopaque with central base structure.

DEVIATED SEPTUM

The deviation of the nasal septum is a common anatomic change

that, most often, is symptomatic. Panoramic radiography, which cover a wide coverage of anatomical structures belonging and related to dentomaxillofacial complex, has become an exam with great advantages for its diagnosis. The bone nasal septum, which can be demonstrated radiologically, is a bony-cartilaginous structure, formed by the perpendicular blade of the ethmoid bone and by the vomer bone that guides the airflow, is part of the nasal valve area and, therefore, helps the nose in the performance of their functions of heating, humidifying, filtering, assisting in olfaction and participating in phonation.

EAGLE SYNDROME

Eagle syndrome or elongation of the styloid process and / or calcification of the styloid or mandibular ligament represents a multifactorial alteration. It's diagnosed on clinical and physical examination, but the confirmation depends on imaging tests. Computed tomography is the method of choice for this evaluation and more useful as it allows measuring the length of the styloid process. Because of the variable degree of calcification and presentation of the stylohyoid complex, a radiographic classification is described as elongated, pseudoarticulate or segmented. The Eagle syndrome makes up the list of differential diagnoses of various cervicofacial entities, knowledge of this disease is essential for the correct diagnosis and hence therapy.

BUCO-SINUS COMMUNICATION

The Bucco-Sinus communication is a complication that may occur after extraction of premolars and molars due

to the proximity of the roots with the maxillary sinus. The diagnosis is made by visual inspection, alveolar palpation, radiographic and Valssalva maneuver. Radiographically visualizes a discontinuity of the sinus wall, visualization of the presence of possible foreign bodies inside the maxillary sinus. The radiographic analysis allows the visualization of the existence of pneumatized maxillary sinus, if there are divergent or dilacerated roots to know if there is a risk of perforating or fracturing the maxillary sinus bone floor during an exodontia.

TONSILLITIS

Tonsilloliths are small calcifications that form in the crypts of the tonsils and are observed in routine radiographic examinations, such as radiopaque images superimposed on the mandibular branch.

Currently, with the use of Cone-Beam Computed Tomography (CBCT), there is an increase in the number of these findings. A radiopaque area suggestive of tonsillolith is found, because they are not located in the ascending branch of the mandible, but in the soft tissues of the region near the air spaces.

DISCUSSION

Immunologic findings have great implications in the discovery and diagnosis of intra and extra-oral conditions. Radiographic techniques, such as panoramic, conventional and computerized images, periapical and occlusal have limitations. However, making the information available when interpreted correctly can save an individual's life.

In this sense, Tuñas and contributors (2012) affirm that the Dental Surgeons should have a global vision of the bucomaxillofacial structures, and also identify changes not directly related to Dentistry, which further extends its usefulness and indication to other working areas.

In case of identification of a atheromatous referral to a cardiologist is essential, which makes it a multidisciplinary follow-up with a neurologist team, neurosurgeon and vascular surgery. Atheromas are fat plaques formed inside an artery, being associated with stroke (stroke).

Atheromas appear as a radiopaque nodular image at the level of the cervical vertebrae C3 and C4, in the posterior region and lower than the angle of the mandible, above or below the hyoid bone. Abreu et al (2011) state in their study that the signs and symptoms are silent, do not present types of pain symptoms, hinder their early identification.

Although the panorama is not a specific test to area, it is useful for early evaluation and diagnosis of patients with atheromatous disease, especially those who are asymptomatic.

Within the calcifications also stand out the sialolitos that are seen on radiographs, and feature a variety of systemic disorders as it has major concerns around them. Your complaint goes from the obstruction of a salivary duct and can cause an infection generating an infectious sialoadenitis.

There are also calcifications ligament Eagle Syndrome-style resemble their clinical and radiographic patients. The cause of pain comes from glossopharyngeal nerve pressure and also an attack of sympathetic nerve fibers, also causing a Horner syndrome.

It was characterized by calcifications at the same time as they appeared high, according to Cavalcante et al. (2017) in his studies of two treatment methods, being a surgical and a conservative. The latter can be done by oral medication of antidepressants and anticonvulsants, local anesthesia with steroids and a physiotherapy is also indicated, while the surgical procedure is done by styloid withdrawal, which can happen intra or extra-oral.

Another calcified modification is the tonsiloliths, which are calculations in the tonsils seen radiographically. They are usually asymptomatic but may show some symptoms such as halitosis and sore throat. Curettage and tonsil enucleation may be indicated, however, when large tonsilloliths removal of the gland is required.

According to Silva et al. (2018), the nasal septum is formed by two parts: a bony part and a flexible movable cartilaginous part. It's common for the nasal septum to deviate to one side of the nasal cavity, and the more pronounced the nasal obstruction becomes. The treatment varies depending on their severity, ranging from antihistamines, nasal decongestants to surgical. When diagnosed by the Dentist, it should be referred to the area's specialties, such as Otolaryngologist and Plastic Surgeon.

The oroantral communication arises especially after extraction of the posterior teeth of the maxilla, causing a pathological communication between the oral cavity and maxillary sinus. The diagnosis is based on clinical and radiographic examination. It's necessary the surgical planning with the own Dentist or the referral to an Implantologist.

CONCLUSION

Considering the possible alterations seen, the importance of the radiographs in the clinical experience of the Dental Surgeon and in the general health of the patient is highlighted. The professional should be guided not only by radiographic examination, but also clinical data for a firm diagnosis. It's worth pointing out the importance of a multidisciplinary work, and the importance of a referral to a specific professional in the area.

In this context, the Dentist should be able to identify common head and neck changes seen in radiographic examinations and have the duty to refer these patients for specific medical treatment preventing possible complications.

REFERENCES

1. Karoline R, Ceretta LB, Simões PW, Ceretta RA, Ribeiro PFA. Profile of reports of intraoral radiographs performed in the south of Santa Catarina state. *Rev. Odontol. Univ. Cid.* 2017; 29(2): 110-7.
2. Naseem S, Nikhil B, Ajay L. Recent advances in imaging technologies in dentistry. *World J Radiol.* 2014; 6(10): 794-807.
3. Jácome AMSC, Abdo EN. Radiographic Aspects of Soft Tissue Calcification in Maxillofacial Region. *Rev. Odontol. Clín.-Cient.* 2010; 9(1):25-32.
4. Vasconcelos MG, Vasconcelos RG, Mafra RP, Rocha AG, Queiroz LMG. Sialolith in Submandibular Gland

- Duct R Bras. Ciên. Saúde 2012;16(2):231-4.
5. Manzi FR, Ferreira EF. Diagnosis for image of sialolito in the gland parotid using conventional x-rays. Rev. Arq. Bras. Odontol. 2010; 6(1):25-32.
 6. Manzi FR, Silva AIV, Dias FG, Ferreira EF. Sialolith in submandibular gland – case report. Rev. Assoc. Bras. Radiol. Odontol. 2007; 8:17-24.
 7. Tuñas ITC, EJC, Veiga LM, Deluiz LF, Weyne SC. Carotid atheromas in panoramic radiographs: how can the general practitioner identify? Rev. Bras. Odontol. 2012; 69(2):203-6.
 8. Melo AR, Santos TS, Amaral MF. Surgical technique for removal of intraoral calculi Ver Cir Traumatol Buco-Maxilo-Fac. 2011;11(4):55-58.
 9. Abreu TC, Brito Filho SB, Sales KPF, Spyrides KS, Oliveira AEF. Panoramic Radiography as Possible Diagnostic Method for Patients with Stroke Risk: A Literature Review Rev. Pesq Bras Odontoped Clin Integr 2011; 11(4):607-13.
 10. Yoon SJ, Shim SK, Lee JS, Kang BC, Lim HJ, Kim MS, *et al.* Interobserver agreement on the diagnosis of carotid artery calcifications on panoramic radiographs. J Imaging Sci Dent. 2014; 44:137-41.
 11. Soares MQS, Castro Jr. RC, Santos PSS, Capelozza ALA, Fischer-Bullen IRR. Contribution of panoramic radiography in the diagnosis of calcified carotid atheroma: case report and literature review Rev. Port. e stomatol med dente cir maxilo fac. 2015;56(2):127-131.
 12. Mehra P, Murad H. Maxillary sinus disease of odontogenic origin. Otolaryngol Clin North Am. 2004; 37:347-64.
 13. Lima CO, Devito KL, Vasconcelos LRB, Prado M, Campos. Odontogenic sinusitis: a literature review Rev. Bras. Odontol. 2017; 74(1):40-4.
 14. Arieta LC, Silva MAA, Rockenbach MIB, Veeek EB. Maxillary sinus extension detected by periapical radiographies Rev Odonto Cienc. 2005;20(47):18-22.
 15. Rebouças DS, Lima RRS, Rocha Jr WGP, Assis AF, Zerbinati LPS. Chronic sinusitis caused by foreign body in the maxillary sinus Rev. Bahiana Odontol. 5(2):131-6.
 16. Nascimento GAN, Vieira KCL, Izolani Neto O, Trajano ETL, Oliveira Jr NG, Barbosa OLC. Incidence of septo deviation in hup panoramic radiographies in theperiod 2016 to 2018 Rev. Braz. J. Surg. Clin. 2018; 23(2):29-33.
 17. Soares J, Rodrigues S, Santos A, Mollgaard O. The importance of multiprofessional diagnosis of eagle syndrome:integrative review Rev Faipe 2018; 7(2): 24-30.
 18. Sá ACD, Zardo M, Paes Jr AJO, Souza RP, Barros Net F, Dreweck MO, Oliveira R, Neme MP, Rapoport A. Elongated styloid process (Eagle syndrome): a case report Rev. Radiol Bras 2014; 37(5):385-7.
 19. Cavalcanti TC. Comunicação buco-sinusal: complicações, diagnóstico e tratamento – relato de caso. Rev Inc 2015; 5(1).
 20. Figueiredo RGM, Rocha RA, Marinho LM. Detection of carotide artery calcification in panoramic radiographs: survey on goias state population. Rev Sau Aer 2018;1(1):29-34.
 21. Palacios VDE et al. Patología calcificante de las glándulas salivales. Presentación de dos casos clínicos. Revista ADM 2018; 75(2): 98-102.
 22. Saccomanno S, Greco F, De Corso E, Lucidi D, Deli R, D'Addona A et al. Síndrome di eagle: Aspetti clinici, diagnostici e trattamento chirurgico. Acta Otorhinolaryngologica Italica. 2018;38(2):166-9.
 23. Cavalcante IL, Barros CCS, Prado JP, Gonzaga AKG, Fernandes APV, Medeiros ROT. Eagle's syndrome: diagnosis and incidence on a Brazilian populations Rev. F. Odontol. 2017; 22(3):288-93.
 24. Izolani Neto O, Freitas JMRG, Goulart RM. Review of literature: cases antrolito, sialolito and tonsilolito. Rev Uningá review. 2014; 18(3): 26-31.
 25. Silva DSN, Rufino RA, Tucunduva MJAPS. Avaliação da relação do desvio de septo com a obstrução do ducto nasolacrimal pela tomografia

computadorizada helicoidal. Rev. Odontol. Univ. Cid. São Paulo 2018; 30(1): 47-53.

26. Borgonovo AE, Frederick BV, Favale M, Maiorana C. Surgical Options In Oroantral Fistula Treatment. Open Dent Journal 2012; 6: 94-8.