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Interpretation of Multilocular Ameloblastoma and Root Dilation of Teeth

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Abstract

Ameloblastoma is an odontogenic tumor composed of teeth epithelium that is benign, develops slowly, and does not cause pain. In general, ameloblastoma is clinically asymptomatic and does not cause changes in sensory nerve function. The indications for periapical radiographs include, among others, to detect apical infection or inflammation; to assess the periodontal status; to identify the presence of trauma to the tooth or the alveolar bone; to assess morphology of the tooth root before extraction; during endodontic treatment; and to evaluate preoperative and postoperative apical cysts and lesions in the alveolar bone; as well as post implant placement evaluation. The radiological features of ameloblastoma that are most often found include multilocular lesions which are often described as soap bubbles if the lesions are large and honeycomb images when the lesions are small, while unicystic ameloblastoma are seen as well-defined lesions surrounded by unerupted dental corona. Radiograph is an important diagnostic tool for various types of oral lesions, especially those involving the alveolar bone. The diagnosis of ameloblastoma is often made based on radiographs. In this case, there was an appearance of ameloblastoma at the tip of the alveolar bone of tooth 18 which is the most common odontogenic jaw tumor. This tumor developed from the epithelial tissue and dental tissue, and was found in various stages of development. Crooked teeth, also known as tooth dilation is a disorder in the teeth in which the tooth bends to form a curve or angle at the root or crown of the tooth. The incidence of maceration can be found in milk teeth and permanent teeth, and more commonly occurs in posterior teeth. Dental dilation is also defined as an abnormality or trauma that occurs in the tooth due to interference between the mineralized and non-mineralized parts of the tooth seed.

Keywords: radiography, ameloblastoma, root dilation of teeth

Background

Ameloblastoma is an odontogenic tumor composed of teeth epithelium that is benign, develops slowly, and is painless. In general, ameloblastoma is clinically asymptomatic and does not alter sensory nerve function. It is visualized radiographically as unilocular or multilocular lesions with a characteristic shape resembling soap bubbles. The more common radiologic feature of large multilocular ameloblastoma lesions is described as resembling soap bubbles, whereas a honey-comb appearance is characteristic of smaller lesions. In unilocular ameloblastomas, well-defined lesions surrounded by dental corona that have yet to erupt can be found. Periapical and panoramic radiographs can be taken to obtain a more comprehensive picture of the tumor. Panoramic radiographs allow delineation of the lesions, while periapical X-rays can be performed to obtain clearer images of the lesion conical into the lesion area.[1]

Ameloblastoma can also cause maceration brought about by tumor pressure which can interfere with the process of tooth formation. Dental dilation is an anomaly in the form of bending that occurs at the root of the tooth or sometimes in the tooth crown. Dilation can be caused due to a history of mechanical trauma, disturbances during teeth formation, supernumerary teeth, and pressure from cysts or tumors.[1] The clinical characteristic of tooth dilation is the root or crown of the tooth that is bent. The laser crown can be seen clinically, but radiographic examination is required to assess root dilation.[2] In the field of dentistry, there are supporting examinations in the form of radiographs used to evaluate teeth and oral disorders that may not be clinically visualized. Radiographs serve as a supporting examination performed to establish

diagnosis, determine treatment plan, and evaluate treatment results. The radiographic examination that is often used in the field of dentistry is intraoral radiography which can be used to show dental abnormalities and surrounding tissue structures.[3]

Good quality radiographs are needed to establish a precise and accurate diagnosis, because poor images can lead to incorrect interpretations and possible diagnostic errors. Inaccuracies can be caused by failures during exposure, failure in handling the film, and failure during processing. Dentists must be able to interpret the results of radiographs properly to correctly determine the diagnosis and treatment plan.[4]

Radiography in the field of dentistry can be divided into two types based on the technique of laying the film, namely intraoral and extraoral. Intraoral radiographs consist of periapical radiographs, occlusal radiographs, and bitewing radiographs. Extraoral radiographs consist of panoramic and cephalometric radiographs. There are several things that can affect the quality of radiographic images, including selection of the technique for the process of taking the image; the selection of tools and specifications; processing and storage of radiographic images; and the patient's position. Radiographs that are of low quality provide incorrect information that deters diagnosis of the appropriate disease.[5]

Radiographs of Ameloblastoma

Ameloblastoma is a benign tumor that has a tendency to recur and metastasize. Viewed histologically, this tumor has an appearance that is close to normal cell structure and the tissue still resembles normal tissue. The differences in shape and size of cells in ameloblastoma exist between the tumor cells themselves. The ameloblastoma tumor cells are called monomorphic as there is usually little variation between cells and all cells come from a single cell type. Ameloblastoma growth usually tends to be slow and occurs gradually. Ameloblastoma can also be said to be a locally aggressive tumor arising from odontogenic ectoderm. These lesions are usually asymptomatic and are found on radiographs or because of asymptomatic jaw expansion. Radiographically, ameloblastoma is described as multilocular radiolucency, the involved tooth roots show varying levels of resorption, whereas the unilocular radiolucency of ameloblastoma is a rare feature. The shape of this tumor is round like a cyst and is clearly defined. Ameloblastomas are classified into four, including (1) multicystic ameloblastoma which is a multilocular radiolucent lesion that usually looks like a soap bubble if it is large and a honeycomb if the lesion is small; (2) unicystic ameloblastoma which mostly appears as a radiolucent lesion that surrounds the impacted 3rd molar with additional radiolucency surrounding the unerupted M3 crown that may have an irregular shape; (3) Peripheral ameloblastoma that may not be viewed through radiographic examination because it is a soft tissue lesion; and (4) Desmoplastic ameloblastoma which is a clinical picture of ameloblastoma that presents with painless buccal swelling mainly located anterior to the maxilla and mandible. It is important to note that peripheral ameloblastoma is a central intraosseous ameloblastoma that affects soft tissue and is a very rare type of the tumor that is generally painless and is thought to originate from the gingival epithelium or remains of the dental lamina. On the other hand, desmoplastic ameloblastoma appears with a multilocular radiolucent or mixed radiopaque lesion with unclear boundaries. The most common appearance of ameloblastoma on radiographic imaging is one of soap bubbles or a honey-comb pattern. On the other hand, unicystic ameloblastomas are seen as well-defined lesions surrounded by unerupted dental corona.[6]

Dental Dilation Radiology

Crooked teeth, also known as tooth dilation, is a disorder in the teeth in which the tooth bends to form a curve or angle at the root or crown of the tooth. The incidence of maceration can be found in milk teeth and in permanent teeth, more commonly in the posterior teeth.[2] Dental dilation is also defined as an abnormality or trauma that occurs in the tooth due to interference between the mineralized and non-mineralized parts of the tooth seed. The etiology of tooth dilaceration is disturbance in the path of eruption due to crowding of teeth, trauma, adjacent bone lesions, or orthodontic traction. However, many believe that trauma is not the main etiology, because the prevalence of dilacerations is highest in posterior teeth, which is located in an area not susceptible to trauma. Presence of scar formation, developmental anomalies of primary teeth, facial clefting, advanced root canal infection, development of ectopic germs with lack of space, effects of anatomical structures (e.g. cortical bone in maxillary sinus, mandibular canal, nasal fossa, which may deflect the epithelial diaphragm), presence of odontogenic cysts, tumors, or hamartomas (such as odontomas and supernumerary teeth), orotracheal intubation and laryngoscopy, mechanical interference with eruption (such as non-resorbable ankylotic primary teeth), tooth

transplantation, extraction of primary teeth, and hereditary factors are usually associated with this condition. Some commonly associated developmental syndromes and anomalies include Smith-Magenis syndrome, hypermobility type Ehlers Danlos syndrome, Axenfeld Rieger syndrome, and congenital ichthyosis. Bilateral dilacerations can occur in many patients, but bilateral dilacerations of both the maxilla and mandible in the same person is rare. There is no predilection for gender. Root dilacerations of incisors, canines, and premolars are more common in a third of tooth roots. Dilacerations of two-thirds of the tooth roots are more common in the molars, whereas dilacerations reaching one-third of the coroma occur in the third molars. Crown lacerations are less common than root lacerations, and they are more common in permanent incisors of RA. The highest prevalence of root dilation occurs in the lower third molars (24.1%), upper first molars (15.3%), upper second molars (11.4%), and finally the upper third molars of (8.1%).[1]

Discussion

Radiography is one of the examination tools used in the field of dentistry as a supporting examination to help make a diagnosis. The technique most often used to determine periapical abnormalities is the intraoral periapical technique. The quality of radiographic photos makes it easier for dentists to diagnose and determine the stages of treatment.[7] The indications for periapical radiographs include, among others, to detect apical infection or inflammation; to assess the periodontal status; to identify the presence of trauma to the tooth or the alveolar bone; to assess morphology of the tooth root before extraction; during endodontic treatment; and to evaluate preoperative and postoperative apical cysts and lesions in the alveolar bone; as well as post implant placement evaluation.[8] Several factors can lead to errors in radiography and in this case black artefacts, which are black spots, are most commonly found.[9]

The root of tooth 16 has been macerated, which is an anomaly that occurs at the root of the tooth, but can also occur in the crown. The etiology of tooth dilation is due to overcrowded teeth, trauma, surrounding bone lesions, and it can also be caused by the presence of ameloblastoma.[1] The clinical feature of tooth dilation is a bent tooth root or crown. Crown dilation can be seen clinically, but root dilation requires a radiographic examination.[2] Tooth root dilation can be caused by the presence of ameloblastoma due to pressure from the tumor which can interfere with the process of tooth formation. There is a radiolucent image of soap bubbles in the area of the alveolar bone tip of tooth 18 which supports the diagnosis of multilocular ameloblastoma at the tip of the alveolar bone in tooth 18. Ameloblastoma is the most common odontogenic jaw tumor which develops from epithelial tissue and the deep dental tissue that can seen in various phases of development.[10] The growth of these lesions is slow but persistent and can cause displacement or resorption of adjacent teeth. Ameloblastoma is formed from an aggressive neoplasm from the remaining dental lamina and dental organs. This tumor is benign, but can potentially become malignant, thus requiring comprehensive evaluation.[11] Ameloblastoma is diagnosed late because of the absence of symptoms and low prevalence. Recurrence in cases of ameloblastoma has been widely reported due to inadequate treatment. The general success of treatment as a whole must be considered along with the correct and timely diagnosis.[12] Ameloblastoma of the mandible can measure up to 1-16 cm in size and can cause facial asymmetry, tooth displacement, fractures, and malocclusion. Ameloblastoma in this case has a soap bubble pattern, describing a multilocular radiolucent lesion. This is an osteolytic process because ameloblastoma grows slowly and radiologically the edges are clearly smooth, corticated, and curved, with clear root resorption that can shift the position of the teeth.[6]

Conclusions

The process of taking radiographic images require close attention to several possible influencing factors, such as the principle of asepsis to avoid cross-contamination from the presence of saliva and blood between the equipment used, thus making it necessary to use complete personal protective equipment in accordance with the procedure for both patients and operators. In addition, the process of communication, instruction, and education to the patient must also be carried out adequately before taking radiographs, because a good level of patient cooperation can minimize the occurrence of errors caused by patients. Radiographs are crucial for supporting the diagnosis of various types of oral lesions, especially those involving the alveolar bone. The diagnosis of ameloblastoma is often made based on radiographs. In this case there was an appearance of ameloblastoma at the tip of the alveolar bone of tooth 18, which is the most common

odontogenic jaw tumor that develops from epithelial tissue and dental tissue, appearing in various stages of development. The growth of these lesions is slow, but persistent, and can cause displacement or resorption of adjacent teeth. Ameloblastoma is diagnosed late because of the absence of symptoms and its low prevalence. Recurrence in cases of ameloblastoma has been widely reported due to inadequate treatment. There is a black artifact error in this case due to the part of the film that is not immersed in the fixer solution when washing the film.

Recommendations

Suggestions for writing this case should be done properly and each stage can be given in order, making it easier to provide an overview to the reader to determine the author's process in taking intraoral periapical radiographs. Successful treatment is affected by comprehensive treatment, along with timely diagnosis and detailed investigations. Carrying out the washing process is even better so that there are no failures in the radiograph results to ensure good picture quality.

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