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RESEARCH ARTICLE

Artifacts in Dental Radiography: A Mini Review.

Dr. Cheena Singh¹ and Dr. Kamal sagar².

1. Demonstrator, dept. of oral medicine and radiology, Post graduate institute of dental sciences, Rohtak , Haryana.
2. Demonstrator, dept. Of periodontics, Post graduate institute of dental sciences, Rohtak , Haryana.

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Abstract

Dental Radiography is one of the mostly used diagnostic investigations in diagnosing various pathologies of head and neck regional. A radiograph is said to be diagnostic if it has high quality, contrast etc. The radiographs which have artifact is not a diagnostic radiographs and needs again exposure of patient which can be harmful for patient. So, a dentist should be aware from different artifacts so that dentist can compare “abnormal from normal” and their correction. Thus, this paper reviews various artifacts occurring in dental radiography.

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Introduction:-

Radiography is a useful tool in various disciplines of medicine and dentistry for diagnosis and treatment planning of diseases. Changes in quality of radiographs may lead to misinterpretation, resulting in incorrect diagnosis and treatment planning.¹ Radiographs with a diagnostic quality aids in accurate diagnosis of the lesions. Dark radiographs are one of the various radiographic faults encountered in daily dental practice resulting in an image with low diagnostic quality which requires a need for an additional exposure to the patient (**FIG No: 1**).² The quality of any radiograph is dependent upon accurate technique and careful processing. Accurate positioning and preparation of patients is needed to ensure the image is not distorted while quality control is critical when screen film is processed (**FIG No: 2**).³



FIG No: 1 To Show Cone Cut And Dark Radiograph

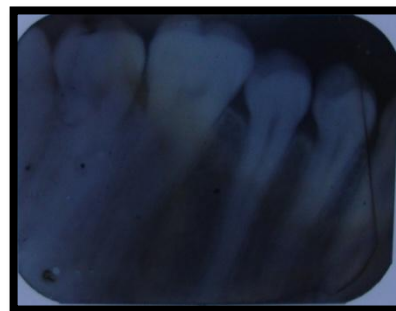


Fig No.:2 To Show Elongated

Corresponding Author:- Dr. Cheena Singh.

Address:- Demonstrator, dept. of oral medicine and radiology, Post graduate institute of dental sciences, Rohtak , Haryana.

Radiograph:-

An artifact is a feature in an image that masks or mimics a clinical feature.⁴ or An artifact is a structure or an appearance that is not normally present on the radiograph and is produced by artificial means. Radiographic errors may be due to technical errors (errors related to technique of taking the radiographs) or processing errors(related to all aspects of processing), improper handling of film packet, excessive movements of tube, the patient's head and or the film may result in a variety of unusual radiographic flaws.⁵

Panoramic radiographs have been one of the most common means for imaging dental structures among dentists due to their many advantages. However, the panoramic radiographs also bear some disadvantages. It provides less sharp images and less accurate information about dental and oral diseases than regular intraoral periapical or bite wing radiographs.⁶

Many types of artifacts and technical errors occur during panoramic radiography. Some of these artifacts are under operator control i.e. proper patient positioning, exposure factors and processing technique. Other artifacts may result from factors beyond operator control i.e. patient movement.⁷ The most common positioning error encountered, palatoglossal air space above the apices of root of maxillary teeth 81.8%, followed by slumped position 17.2%.⁸ Synthetic hair braid extensions are only type of synthetic hair extensions that might cause a radiopaque artifactual interference on panoramic radiograph. Artifacts appear in many forms of radiography. Ghost images by hair pins and jewelry are often encountered and well documented in panoramic radiography.⁹ in order to get around of this problem of ghosting, we need to display the stitched image as if nothing in the scene moved. Another problem in automatic image stitching is exposure differences between images. If the difference is not corrected, the panorama will appear to have seams, even when the images are blended in overlapping regions.¹⁰ However, as in all imaging modalities; there are potential hardware and software artifacts that may lead to wrong radiological diagnosis. Being aware of these artifacts would ensure a correct diagnosis and the appropriate treatment given to the patient.¹¹

For being aware of these artifacts, the systematic method to identify the artifacts on X-ray films includes:-

1. One needs to know about the anatomical landmarks to differentiate the undiagnostic object (artifact) present on radiograph.
2. One needs to identify other object other than anatomical landmarks which appears as artifacts on radiograph as hair pins, ornaments (nose pins, necklace, and ear rings), mufflers, spectacles etc.
3. Ghost images are very important to differentiate .They might be resulting from normal anatomical landmarks. Other times they also might be resulting from other objects. They might be single, double and multiple often magnified, located at higher position and even blurred. There are many types of artifacts which include discoloration (dark, light, brown, black, yellow, fogging etc), elongation, foreshortening, cone cut, finger prints on radiographs due to improper handling of x –ray film, ghost images etc. Discoloration of films is mostly resulting from the processing errors and it can be of various types. However a small discoloration may be attributed to expired films and some may be attributed to excessive exposure to safe light, visible light and no exposure.
4. Care full examination and prior knowledge deals proper identification, correlation and differentiation of artifacts.

Conclusion:-

The value of any diagnostic procedures depends upon the amount of information gained by its utilization. Presence of any artifacts whether it is technical or processing both decrease the diagnostic value of radiographs and lead to double exposure of patient. Dentist should aware from all the artifacts and also know the remedy for this. So that accurate diagnosis can be done properly.

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