



Increasing Radiation Exposure in Routine Dental Radiography as a Possible Side Effect of COVID-19 Pandemic: An Experimental Report

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Intra-oral and extra-oral radiographs are useful and necessary diagnostic tools in dental practice. Although radiation doses in these two techniques are generally low, exposure to radiation should be minimized where practicable (1,2). It is important to know that any dose of radiation has the potential to induce pathological changes and even small doses might cause damage to tissues. It is generally accepted that there is no threshold dose below which radiation is completely safe (2,3). Therefore, all dental practitioners are professionally liable for any risks which might be related to radiation exposure (3). In order to reduce the negative effects of radiation, dentists should follow the as Low As Reasonably Achievable (LARA) rule. This is applicable to all aspects of radiography including, the number of films that should be taken, the amount of dose and techniques to be used (3).

For example, periapical radiographies, as the most common requested intra-oral radiography are usually used for evaluation of dental caries, fractured teeth, external and internal root resorptions, pre and post extraction evaluation, periodontal ligament widening, *etc*; whereas panoramic radiographies, as the most common prescribed extra-oral radiography are used for evaluation of jawbone diseases, traumatic fracture, impacted teeth, developmental anomalies, and temporomandibular disorders (4,5). On the other hand, the median effective dose for a periapical radiograph with D-speed film is between 2.0 and 4.0 μSv according to its collimator type (3). This number is 5 μSv for posterior bite-wings with F-speed film and also it is 20 μSv for a panoramic radiograph (6). Fortunately, the relative risks associated with dental radiography are low; however, induction of fatal cancer or serious hereditary ill-health has been estimated to be approximately one in 10 million and one in a million for each periapical and panoramic radiograph, respectively (3).

Based on the aforementioned issues, it can be concluded that the correct administration of radiography is not only effective in diagnosing the patient's problem, but also plays an important role in protecting them from possible complications of radiation. However, unfortunately, based on the authors' observations and clinical experiences, in the current situation of the COVID-19 pandemic, in some cases, proper radiography is not requested, the continuation of which can become

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Based on the aforementioned issues, it can be concluded that the correct administration of radiography is not only effective in diagnosing the patient's problem, but also plays an important role in protecting them from possible complications of radiation. However, unfortunately, based on the authors' observations and clinical experiences, in the current situation of the COVID-19 pandemic, in some cases, proper

radiography is not requested, the continuation of which can become a routine practice leading to some problems in the future.

Due to the possibility of transmission of Covid-19 through oral secretions (7), people are becoming more concerned about their oral cavity and infections that may be transmitted in dental procedures. According to our observations in some cases extraoral radiographs, in particular, panoramics are increasingly being requested instead of intraoral radiographs such as periapical or bite-wing, which not only do not have a scientifically indication, but also confront the patients to more radiation exposure and more expenses. Although it seems that the main reason for this is the patients' request and their concern about holding the radiographic film in their mouth and the fear of possible contamination that follows, but this point should not cause the dentist to forget professional ethics and accept any request from patients.

In addition to the danger of turning such wrong requests into routine practice over time, panoramic radiographs have many limitations (8), including superimpositions of various intraoral and extraoral structures, especially in the anterior region of the jaw, it cannot be a suitable alternative to intraoral radiographies, which give clearer images of teeth. For example, overlaps of the proximal surfaces in panoramic image may cause interdental caries to be missed which importantly their early detection is effective in the overall prognosis of teeth. Moreover checking the quality of root canal therapy for subsequent prosthetic or veneering treatments through a panoramic view is unprincipled and can be misleading.

Above all these, it's the dentists' responsibility to protect patients from the effects of radiation and expose them to the minimum possible dose of radiation. While the amount of radiation in a panoramic radiograph is between 5 to 10 times that of a periapical radiograph, the probability of carcinogenic changes following a panoramic radiograph is 10 times that of a periapical radiograph (3,6).

Taking into account all these points, dentists should try to build trust in patients by adherence to the principles of infection control. They should deny such requests and consider it their duty to protect patients based on professional principles.

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