



F24 Do Insect Artifacts Affect the Quality of Forensic Dental Radiographs?

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The participant will learn about the potential for insect artifacts to affect the forensic quality of postmortem dental radiographs.

This abstract and slide presentation will give the details on the methods and conclusions of a study designed and performed to determine whether or not insects in the oral cavities of decomposing deceased individuals can be evident on dental radiographs taken during forensic dental evaluations. Such artifacts could interfere with the forensic quality of the dental radiographs.

In the hot and humid state of Texas, it is frequently necessary to perform forensic dental evaluations and comparisons of human remains in various stages of decomposition. Quite often, the oral cavities of these deceased individuals are filled with insects of various types. Prior to performing the intra oral examination or taking any radiographs, it has been routine to clear away any insects present.

This study was designed to determine if insect artifacts appear on postmortem dental radiographs, and if they do, then at what exposure levels they would be most evident. The decomposing human remains chosen for this study were those of an unidentified white male, approximately 17 to 32 years of age, found floating in a shallow creek by a passing motorist. The time of year was late spring, and the local temperature during the previous days had been in the high 80s Fahrenheit. The decedent was floating face down in approximately six inches of water. There was an apparent gunshot wound to the chest. The oral cavity was filled with a multitude of larvae, also known as maggots.

A single larva, representative of the majority of the maggots present in the oral cavity, was chosen for this study. The larva was very chilled from having been in the morgue cooler quite some time; therefore, it behaved very well and did not move during the taking of the radiographs. It measured 7/16 inch in length and 2/16 in width. The maggot appears to be one of the blow fly types, most likely a hairy maggot blowfly. They possess a high level of chitin in their tissues and have very distinctive protective spines that act as protective armor on their bodies. This species is of particular forensic importance in the southeastern, central, and southwestern portion of the U.S. as the adults are often among the first insects to arrive at a recently deceased person in these areas.

Single-film packets of dental radiographic film (KODAK brand, Ultra-speed D, safety film) were labeled with the exposure setting to be used for each film. A KVP of 70 was used for all exposures. The exposure settings to be used were the standard ones on the radiographic unit: 0.01, 0.02, 0.04, 0.05, 0.06, 0.08, 0.10, 0.12, 0.16, 0.20, 0.25, 0.32, 1.40, and 0.50. Each film was placed under the representative maggot and was exposed according to the label on the film pack. Each film was exposed at a precise distance of two inches from the radiographic cone head. The cone head was never moved; instead, the film and maggot were located on a movable cart to allow consistent distance from the radiographic cone head for each of the films taken.

After carefully viewing the series of radiographs, the maggot was quite visible in the 0.04 exposure to the 0.16 exposure range. In general, dental radiographs are taken in the 0.16 to the 0.25 exposure range, so it is possible that maggots, in sufficient numbers, could adversely affect the quality of the postmortem dental radiographs. Previous experiences have also demonstrated that maggots embedded in unhealed sockets of postmortemly avulsed or missing teeth have necessitated the remake of radiographs after their removal from the deeper portions of the sockets.

In conclusion, it is advisable for the forensic dentist to remove all maggots prior to taking the postmortem dental radiographs. During the slide presentation, photographs documenting the study will be presented and elaborated upon.

Forensic Sciences, Forensic Dentistry, Forensic Entomology