F47 Identification of the Edentulous Individual: An Investigation Into the Accuracy of Radiographic Identifications

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After attending this presentation, attendees will understand that the identification of edentulous individuals is often found to be problematic, due in part, to a poor uptake in the labeling of complete dentures.

This presentation will impact the forensic science community by highlighting the fact that the dental identification process is often found to be challenging due to the lack of antemortem materials and/or unique features more commonly visible in dentate radiographs.

Since radiology provides the basis for most dental identifications it would appear reasonable to assume that the majority of dental records may provide useful information to facilitate comparative identification. However, the task of identifying found human remains based on dental comparisons of postmortem and antemortem radiographs is labor- intensive, subjective, and has several drawbacks, including inherently poor image quality, difficulty in matching the viewing angles in postmortem radiographs to those taken antemortem, and the fact that the state of the dental remains may entirely preclude the possibility of obtaining certain types of radiographs postmortem.

This less than satisfactory situation is more often than not, exacerbated by the constant resorption process occurring within the maxillary and mandibular alveolar ridges over the lifetime of an edentulous individual. From such observations it could be argued that any radiograph taken of an edentulous ridge may at best represent only a “snapshot in time” of that process, hence unless the examiner is proficient in matching bone trabeculations, such temporal changes in residual ridge morphology have the potential to mislead all but the most experienced of dental investigators.

The purpose of this study therefore, was to quantify the error rate and reliability of dental identifications based on a comparison of synthesised antemortem and postmortem radiographs of edentulous individuals. Ten observers examined ten cases on two occasions and reported dichotomous and conclusion level decisions. The data were analyzed using Kappa and ROC. The mean area under the curve was 0.75 and the mean sensitivity was 0.57 and specificity was 0.83.

The results obtained from the data suggest that dental identifications of edentulous individuals using radiographs alone have a high error rate and hence should be dual reported. Forensic organizations worldwide have recommended that dental prostheses should be labeled with at least the patient’s name and preferably with further unique identifiers such as social security number, etc. The data obtained from the aforementioned study add further weight to the argument that all dental prostheses should be labeled and that all dental implants should be serialized.

Forensic Science, Radiography, Denture Marking

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