G44 The Ability to Discern Dental Restorative Materials on Radiographs for Dental Identifications

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After attending this presentation, attendees will realize that many of the newer Computer-Aided Design/Computer-Aided Manufacturing (CAD/CAM) restorations may appear "tooth colored" and natural in the mouth, but actually appear radiopaque on dental radiographs. Forensic odontologists routinely observe and compare postmortem and antemortem dental radiographs.

This presentation will impact the forensic science community by increasing awareness of the fact that it is no longer possible to distinguish a metallic vs. a non-metallic restoration simply by viewing dental radiographs alone, and forensic odontologists must examine the decedent or refer to antemortem treatment notes in order to determine the type of restorative material present. This presentation will strongly encourage medical examiners and coroners to request a consultation with a forensic dentist as often as possible to ensure correct dental charting.

This research project is the result of participation in the University of Texas (UT) Health School of Dentistry's 2016 Summer Research Program. This project developed a database of radiographic images of newer restorative dental materials designed to be used as a reference source in forensic dental identifications. There have been several studies investigating the characteristics and radiopacity of ceramics, composites, and other restorative materials, but none contain a significant grouping of images to serve as a reference source.

After receiving Institutional Review Board (IRB) approval for the study, a retrospective chart review was performed to gather post-treatment radiographs of various types of dental restorative materials. Constructing the database of radiographic images involved utilizing the school's electronic health records to view patient radiographs after a restoration. By using the Info Manager Search feature, a text search was performed for current dental materials or brand names in the Progress Notes. Once the specific dental material or brand name was confirmed, a search for a post-restoration radiograph ensued. The radiograph was collected and used in assembling the databank of images. The types of restorations collected were amalgam, direct composite resin (ex: Filtek™ Z250), glass ionomer (ex: Fuji LC®), gold, indirect restorative composite (ex: Belleglass or Premise™), IRM®, monolithic zirconia CAD/CAM crown (ex: BruxZir®), porcelain-fused-to-base-metal, porcelain with ceramic substrate (ex: Procera®), and stainless steel.

Next, an online survey was developed to assess the ability of forensic odontologists, dental faculty, and dental students to discern recently introduced dental restorative materials from dental radiographs. A letter of invitation for the online survey was sent to the following groups of individuals: School of Dentistry faculty, School of Dentistry students and residents, Diplomates of the American Board of Forensic Odontology, and members of the American Society of Forensic Odontology. The survey consisted of ten demographic items and ten query items and was estimated to take less than ten minutes to complete. The survey items displayed a dental radiograph and prompted the participant to identify the restoration's material from a multiple-choice list, stating that all responses would be grouped and no individual would be identifiable, thus all responses were completely confidential.

At the time of this abstract proposal, the online survey was still active, so results will be summarized during the presentation. It is presumed that the survey results will confirm the hypothesis that we will no longer be able to distinguish metallic vs. non-metallic restorations on radiographs in the future. The study results will encourage medical examiners to consider requesting forensic dentist consultation as often as possible to ensure correct dental charting.

Forensic Science, Forensic Dentistry, Forensic Dental Identification