



F3 Radiopacity of Prefabricated Composite Resin Posts: A False Negative in Dental Identifications

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The goal of this presentation is to describe the possible pitfall of the radiographic appearance of new composite material radicular posts.

This presentation will impact the forensic community and/or humanity by preventing inaccurate data entry and a missed human dental identification.

The objective of this presentation is to familiarize forensic dentists with a possible pitfall regarding radiographic detection of new polymer based endodontic posts.

Nonmetallic prefabricated radicular posts are coming into greater clinical use. The lack of radiopacity found with some posts in combination with their luting cement can make radiographic interpretation difficult. Glass or carbon composite material by its own nature will not absorb x-ray energy to the extent of metal products and will appear much less radiopaque when imaged. To that end, ISO 4049 (2000) for polymer-based materials stipulates that a material must be formulated to exhibit the radiopacity of an equivalent thickness of aluminum to be deemed radiopaque. This means that the material in question should have an equal radiographic opacity to an equivalent thickness of aluminum. The purpose of this specification is to make the cemented post detectable in any radiographic series.

A previous study by the authors of this presentation tested the relative opacity of five polymer-based radicular posts and four luting agents commonly used for post cementation for their radiographic aluminum equivalence. This was accomplished by exposing digital radiographs of the test samples and measuring their opacity relative to an aluminum ramp which was included in the images. Density comparison to the equivalent thickness of aluminum revealed that only two of the posts met specifications with one of the three at one-half the required opacity and another at 20%. Also, two of the four cements were below the stipulated aluminum equivalence and would not be of help in making the post detectable.

These findings indicate possible future problems for forensic dentists in antemortem and postmortem data collection in the identification of human remains. If written dental records are sketchy or poorly recorded, there could be cases where the presence of the post goes totally undetected if the opacity is too low. Also, it is a standard practice to "go with the radiographs" if there is conflict between the written records and films taken subsequent to the chart entry. Cases of dental fraud wherein procedures have been recorded and reimbursed by patient insurance but never actually performed are all too often encountered when making identifications.

It is also reasonable to assume that any postmortem data collection involving such material without the aid of a written chart at hand will result in a false-negative assessment of that tooth for the presence of a post, particularly in a mass fatality incident where teams are working separately. In cases where the remains are fragmented, this could result in an unexplainable discrepancy in the findings and prevent the positive identification of that individual.

This presentation has been made to make forensic dentists aware of what may be a growing interpretation problem in human identification. Any discrepancy between written records and radiographs as related to "missing" radicular posts should be carefully scrutinized along with possible contact with the dentist submitting the antemortem records for clarification. Product density ratios and example radiographs will be shown in the presentation to illustrate the need for concern.

Identification, Composite Posts, Radiographic