G37 Restorative-Era Identification of a Severed, Embalmed Head

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After attending this presentation, attendees will better understand the use of dating restorative materials in postmortem profiling.

This presentation will impact the forensic science community by increasing awareness of variations in restorative materials and techniques in different eras and applying this information in establishing a postmortem profile.

The practice of dentistry has undergone dramatic changes in the past 60 years with the introduction of adhesive restorative materials. These products have improved the esthetics, strength, durability, and predictability of restorative dentistry. This is especially true of materials used to restore anterior teeth. Manufacturers have introduced products with varying properties and chemical makeup, and these products have evolved over time. These properties can be used by the forensic odontologist as a marker of different eras. This information is useful when establishing a postmortem profile of an individual. Thus, an approximate time frame can be established by analyzing and identifying the materials and probable techniques applied in a victim's restorative profile. Essentially, in order to have received a specific type of treatment with specific materials, a victim would have needed to undergo the restorative procedures during a certain period of time when these techniques and materials were commonly available.

In December 2014, an embalmed head was discovered roadside in a municipality in Pennsylvania. A forensic dental exam was performed on the recovered specimen by the local forensic dental consultant and reported to the coroner. In another municipality approximately 90 miles away, a mausoleum was found disturbed with the door ajar. Further investigation discovered a headless body. Questions were raised regarding if the embalmed head belonged to the headless body. The date of interment in the mausoleum was known. There was little information available on the embalmed head. The postmortem dental profile of the head revealed dental treatment that was not consistent with the level of treatment available at the time the body was interred. The dental treatment on the severed head appeared to postdate the type of care available at the time the headless body had died because the treatment used advanced materials and techniques. The consulting forensic odontologist in Pennsylvania requested assistance from the Laboratory for Forensic Odontological Research at the State University of New York at the Buffalo School of Dental Medicine to evaluate the restorative materials in the severed, embalmed head. The Pennsylvania State Police delivered the head to the University in January 2015 for analysis. The goal was to analyze the restorations, determine elemental composition and other properties, and possibly estimate the era or period the restorative materials were available and in use. Cone beam and conventional radiography and Scanning Electron Microscopy with Energy Dispersive Spectroscopy (SEM/EDS) were utilized for the analysis. Radiopacity and elemental composition were also evaluated.

The information obtained through the laboratory analysis, in addition to the postmortem dental profile of the embalmed head, determined that there was not a relationship or link between the severed head and the headless body. The dentistry of the embalmed head postdates the death of the interred body. Further investigation is required to locate the missing head and body.

Dental Profile, Restorations, Analysis

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