



### **F14 Use of Digital Photo Enhancement Software as an Aid in Edentulous Victim Identification**

*Henry J. Dondero, DDS\*, 2 Emerald Drive, Glen Cove, NY 11542*

The forensic odontologist must be able to utilize all devices and methods available in the quest for victim identification. The goal of this presentation is to present the use of digital photo editing software as an aid in accentuating bony landmarks.

This presentation impact the forensic science community by encouraging the forensic odontologist to be aware of the various investigative modalities available.

The forensic odontologist may not be able to identify every victim he or she encounters due to a multitude of reasons. One situation arises when a victim presents with few or no restored teeth. It is particularly challenging when a victim is edentulous. To receive antemortem radiographs that date back more than ten years further compounds a difficult situation. The following case is an example of such an

identification. What is particularly unique is that the bony identifiers were highlighted through the use of digital photo editing software.

This case involved partially skeletonized remains found on the muddy bank of a lake located in a nearby state park. Initial examination revealed a badly fragmented maxilla and associated cranial structures with no teeth present. The victim's mandible was also fragmented. There was complete bilateral fracture of the left and right angles. Both condyles and associated ascending rami were missing. The remainder of the mandible; however, was intact. Clinical charting of the mandible revealed the presence of tooth #27 with a full crown aesthetic restoration. Tooth #22 was missing and appeared to have been evulsed postmortem. The remainder of the mandible was edentulous with well healed bony ridges. The maxilla was badly fragmented. There were numerous missing structures and it was impossible to determine an accurate evaluation of the dentition. Whatever cortical bone was present appeared to be well healed and edentulous. The assumption was made that the victim's entire maxilla may have been edentulous.

This case was ruled a homicide and the State Police suspected that the victim was an ex-convict. The last known dental record was a panoramic radiograph taken when the victim was incarcerated fourteen years earlier. The x-ray was taken as a matter of course and no subsequent treatment was rendered. This radiograph was requested from the Department of Corrections. Examination of the radiograph revealed an underdeveloped copy of a rather grainy original panoramic film. The maxilla was edentulous and the mandible showed bilateral edentulous saddles with teeth #21-28 present. Postmortem radiographs of tooth #27 were taken and compared to the antemortem panoramic x-ray. This offered no definitive points of identification. Several radio-opaque and radio-lucent areas were noted in the mandible and an attempt was made to compare these areas with the antemortem radiograph. Because of the poor quality of this x-ray a process of digital photo enhancement was undertaken. The radiograph was scanned at a high resolution and saved as a TIFF file. This file was then opened in a digital photo editing software application and adjustments were made to the brightness, contrast, and sharpness of the image as well as enlarging certain areas of interest.

The resultant enhanced images afforded the opportunity to more accurately compare ante- and postmortem radiographs sufficient to establish identity. Areas of increased calcification, possibly retained root fragments, were compared as well as several radiolucent areas containing specific trabeculation.

#### **Radiograph, Digital, Enhancement**