F20 Physical and Radiological Appearance of Human Teeth Exposed to High Temperatures

Lee P. Coppess, DDS, 7061 E Hayden Haven, Hayden, ID 83835*

After attending this presentation, attendees will learn of the effects of high temperatures on the appearance of human teeth at various lengths of exposure time.

This presentation will impact the forensic science community, especially those relatively new to the odontology field, by visually demonstrating varying degrees of thermal destruction of human teeth when subjected to a constant temperature (1,000°F) for varying lengths of time.

Burned human remains may be recovered from a wide variety of incidents, many of which include structural fires and vehicle fires. Likewise, these fires may include an extremely wide range of temperatures. The soft tissues of the oral cavity provide a certain degree of insulation to the teeth until they are consumed by the immolation process.[1] Certainly, due to the wide range of temperatures and exposure times that burn victims are subject to, there can be no constant values for the appearance of the teeth. In gathering the information for this presentation, human teeth were subjected to a temperature of 1000°F for ten minute-increments exposure time up to 50 minutes. Two separate sets of teeth were treated: the first set was molars, similar in size and shapes, the second set were premolars, also similar in size and shape. A dental laboratory burn-out oven was used for the heat source. A set of two photographs and radiographs were made of each tooth, one prior to and one following their exposure to heat.

Results: There was very little difference in physical appearance of the teeth between the ones heated at ten minutes and the ones heated for 50 minutes, although as the length of time increased, there seemed to be an increase in the brittleness of the enamel of the teeth. In all cases, the enamel became extremely brittle as is documented by the photographs. Radiographically, again there was little if any difference in appearance between the exposure times, other than for the breakdown of the enamel portion of the teeth.

Conclusions: The physical and radiological appearance of teeth observed or recovered from a burn victim would likely not allow an investigator to offer an opinion as to the intensity of the heat or the duration of time that the victim was exposed to the heat source.

Reference:

1. McGivney, James, DMD. The Identification of Burned Human Remains. Proceedings AAFS, volume 18, page 266.

Teeth, Exposed, High Temperatures

 ** Presenting Author*