H156   Multiplanar Reconstruction (MPR) of Antemortem Computed Tomography (CT) Images to Visualize Sphenoidal Sinus and Cranial Base Morphology for Identification Purposes

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Learning Overview: After attending this presentation, attendees will understand how to process an antemortem CT image series into a 2D projected image using Multiplanar Reconstruction (MPR) that can be used, in conjunction with or in lieu of conventional antemortem radiographs, to establish positive identification.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing a simple methodology to project an antemortem CT series that can be easily compared to a postmortem radiograph or postmortem CT. Additionally, this methodology can be used to provide an antemortem radiograph of a missing person that could be used to compare to unidentified skeletal remains.

Establishing positive identification via scientific means is a primary objective of the medicolegal death investigation. Identity can be determined quickly via fingerprint comparison if the decedent has prints on record. In cases in which there are no prints on file or the decedent is in advanced stages of decomposition or completely skeletonized, the use of other methods such as DNA or radiographic comparisons is necessary. Radiographic comparisons are a likely means for positive identification because they obviate the practical and logistic limitations of other methods and are often readily available in many instances.

Clinical medicine has steadily increased the use of CT imaging since their introduction resulting in the possibility of using antemortem CT data for identification purposes. Although CT scout films may be taken during a clinical exam, the image quality and/or view may not provide sufficient points of concordance to conclude a positive identification when comparing them to postmortem radiographs. A solution to this is to utilize software that allows MPR of the CT data to create a projected image to facilitate comparison to postmortem radiographs or CT. This methodology is particularly useful when dealing with skeletal remains and could provide an additional approach for identification via radiological comparisons from antemortem CT images of missing persons to unidentified skeletal remains within the National Missing and Unidentified Persons database (NamUs).

Obtaining antemortem CT scans during a death investigation is a common occurrence; however, technical knowledge on how best to utilize this data varies greatly between personnel and agencies conducting a death investigation. This presentation will: (1) present free and cost-effective software options to create an MPR of antemortem CT data, (2) provide a basic review and steps on how to create a 2D projection from the MPR, (3) present three examples of 2D projections that achieve positive identification by using sphenoidal sinus and cranial base morphology, (4) discuss future research utilizing MPR of antemortem CT data, and (5) the utility of creating projections of missing persons in NamUs to possibly aid in the identification of unidentified individuals. The implementation MPR-projected images from an antemortem CT series will provide forensic anthropologists, radiologists, odontologists, and pathologists another avenue for the positive identification of remains.

Forensic Radiology, Positive Identification, Computed Tomography Scan Projection