H7 Identification by the Numbers: A Case Study in Skeletal Trauma Examination and Surgical Implant Tracking

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The goal of this presentation is to illustrate how thorough skeletal analysis teamed with surgical implant investigation/tracking lead to the positive identification of unknown skeletal remains. Further, this presentation will illustrate the need for multi-agency/disciplinary cooperation in successful case resolution.

This presentation will impact the forensic community by demonstrating how unknown skeletal remains can be positively identified through surgical implant tracking teamed with anthropological analysis.

This case study demonstrates how uniquely numbered medical implants/devices can be used to search medical records for unknown indi- viduals. A multidisciplinary/multi-agency approach provided different lines of evidence that brought this case to successful resolution.

In March 2007, relatively complete skeletonized human remains were discovered lying on the ground surface near a major interstate in Franklin County, Missouri. The area of discovery was near an interstate exit and overpass that is known to attract transient individuals. Clothing and possible bedding materials were associated with the remains. No identification media were readily apparent for the deceased. Investigators from the Franklin County Sheriff's Office, in conjunction with the Franklin County Medical Examiner's Office, performed a detailed recovery of the remains and all asso- ciated evidence. The remains and associated clothing were removed *in situ* and transported to the Medical Examiner's Office in St. Louis County, Missouri for examination by a forensic anthropologist.

The skeletal remains were in a good state of preservation which facili- tated a relatively complete biological assessment. Extensive antemortem and perimortem trauma was observed and documented. The majority of the observed antemortem trauma was present on the left side of the body. Of particular interest for possible identification were areas of antemortem trauma that had been fixed with surgical implants/devices which appeared consistent in age based on the observed level of bone remodeling. This suggested that they were produced from the same traumatic event. The cranium exhibited extensive surgical repair of left maxilla fractures with mini-plates and screws (n=3), surgical repair of left orbit fractures with orbital floor implants, and a healing fracture located on the superiomedial aspect of the left orbit. An antemortem fracture of the left proximal ulnar diaphysis had been stabilized with a plate and screws. Finally, the left tibia had been fixed with an intramedullary rod and screws. A subsequent oblique fracture event of the distal tibia had displaced one of the screws. The secondary fracture had not been medically treated and the bone was extremely reactive in this area. A healing oblique fracture of the left distal fibula was also observed. This fracture appeared to have occurred at the same time as the secondary fracture of the left tibia and also showed no evidence of medical treatment. Observed perimortem trauma included blunt craniocerebral trauma in addition to blunt and sharp trauma of the chest and neck consistent with homicidal violence.

An identical service/trademark and unique numbering were observed on the surface of the intramedullary rod and the ulnar surgical fixation plate. A search on the service/trademark through the Missouri Intelligence Access Center (MIAC) linked the design with the company Synthes, Inc., a global provider of trauma implant devices. Synthes, Inc. was able to provide inves- tigators with a list of hospitals nationwide that had received devices with the same numbering schemes. Although ulnar fixation plates are quite common, the unique combination of implants in this case provided investigators with a truncated list of possible individuals for comparison. The developed biological profile served to further shorten the list. From this abbreviated list, the Franklin County Medical Examiner's Office requested and received medical records from a hospital in Tulsa, Oklahoma for an individual who had received both implants after being struck by a vehicle in 2002. Comparison of ante- and postmortem radiographs led to the positive identi- fication of this victim. Identification was made within 90 days of body recovery.

This case study demonstrates how mulit-agency/multidisciplinary coop- eration is imperative for timely case resolution. Although the numbering present on the surgical devices was not unique, investigators were able to compile a shortened list of possible individuals which was further reduced by the developed biological profile.

Identification Techniques, Trauma Analysis, Skeletal Remains

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