F8   The Problem of Identification by Dental and Skeletal Morphology: A Quantitative Issue?

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This presentation will demonstrate how both dental and osteological morphology may be quantified when dealing with identification of human remains. This implies that the odontologist or anthropologist may supply courts with a numerical possibility of identity.

Identification by odontological and skeletal methods is frequently based on a qualitative assessment. Very rarely can one quantify morphological aspects (e.g., the shape of teeth, bones, or dental work) and thus quantitate identification. Forensic odontologists frequently assert that quantification is not necessary, whereas radiologists and anthropologists who strive to identify human remains via bone morphology say that it is sufficient to find 8-10 distinctive morphological traits when comparing antemortem and postmortem data. However, it is not clear what distinctive morphological traits are, both in the dental and osteological scenario. The authors set forth to verify whether it is possible to apply a semi-quantitative method when comparing dental and bone morphology in order to supply courts with a "number" or probability when identifying human remains. The scope of this study was therefore to verify the possibility of identifying a subject according simply to dental and bone (1st thoracic vertebra) morphology.

Dental study: A radiographic study was performed on 50 orthopantograms (OPTs), two for each subject performed at different times (within a ten year range). Every OPT of an individual was superimposed with all OPTs of the other individuals. Dental morphology was compared by examining the profile of each tooth, also by superimposition. A scoring system was then adopted for each dental profile.

Osteological study: In the osteological study 10 vertebrae (1st thoracic) were used (from ten different individuals), and each radiographed in 15 different positions (which diverged of a maximum of 15 degrees from each other). All images were compared, similarly to the dental study, by examining the bone profile and by superimposition with all others. A score was also given in these cases.

Finally, from the score, a correspondence index was calculated, both for the dental and osteological study. In all cases, correspondence indices allowed the authors to find thresholds that allowed them to exclude or identify individuals by comparing X-rays or bone morphology.

This study, though certainly not conclusive, shows that dental, bone (1st thoracic vertebra) morphology is extremely specific, and that a scoring method for comparing morphology may be useful as a quantitative tool for identification.

Forensic Odontology, Identification, Forensic Anthropology