H26 An Assessment of Tissue Depth Measurement Tables Used for Facial Reconstruction/Reproduction

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After attending this presentation, attendees will see that tissue depth tables require further research and data set collection in order to produce the most accurate facial reproduction renderings.

Basic research for tissue depth measurements is limited and this presentation will impact the forensic community and/or humanity by showing how further collection of data is necessary to lend any validation to techniques in facial reproduction.

An assessment of standard tissue depth measurement tables used for forensic facial reconstruction, versus recorded postmortem tissue depth measurements, was performed. The purpose of this study is to examine current facial reconstruction standards for their accuracy related to age, sex, and ethnicity of the cranial specimen for which facial reconstruction(s) was performed. In addition, areas of future facial reconstruction research were evaluated.Previous studies and research have documented the various techniques including, computerized tomography, ultrasound, and needle insertion, for acquiring tissue depth measurements. However there is not one uniform method for acquiring these measurements.

There is debate in the field regarding the acquisition of measurements from live versus deceased individuals as well as the distortion of accurate measurements that may occur in some of the previously mentioned methods. Both experts and artists, who perform reconstruction techniques, use a variety of the tables depending on accessibility, knowledge or preference. Some of the tissue depth tables that are used were created over one hundred years ago. Additionally, a summary of previous studies, research, and tables is not available, which ultimately limits the accessibility of data necessary to accurate facial reconstruction/reproduction.

This study contributes additional data sets and elaborates on a previous preliminary tissue depth study. Cranio-facial measurements were submitted to facial reconstruction experts for a blind study examination. Tissue depth measurements were taken from a whole body donor and will be compared to the measurements used to create the facial reconstruction/reproduction model(s). Data will also be reported on accuracy of the various rendering techniques the experts chose to perform.

Tissue depth measurements were taken at twenty-one established anthropological and forensic measurement sites on the facial surface of a whole body donor. Eight other facial soft tissue measurements were taken for comparison with the facial reconstruction renderings. The cranial measurements were acquired following natural entomological decomposition techniques rendering the entire skull free of soft tissue and exposing the cranial surfaces and structures. Prior and subsequent to decomposition, photographs were taken of the donor.

The collected craniofacial measurements and photographs, as well as a questionnaire, were submitted to rendering participants. The experts were asked to create two and/or three-dimensional renderings, which will be compared to the documented tissue depths and craniofacial measurements taken from the donor. Additionally, experts were asked to report their choice of technique and/or table. Their chosen measurements will also be compared with the collected tissue depth measurements. Discrepancies between the donor measurements and the tissue depth tables will be reported as the study is concluded.

During this study, further research needs have been identified. A comparison study of tissue depth measurements performed prior to death via a computerized tomogram and another computerized tomogram after death on the same individual would answer one of the questions about the effect of dehydration on the tissue depth measurements. Potentially, this added research data would assist those performing facial reproduction/reconstruction(s) in producing a more accurate representation of the aesthetic identity of an individual.

Tissue Depth Measurements, Facial Reproduction, Craniofacial Measurements

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