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PERSONAL IDENTIFICATION: RECONSTRUCTION OF GEOMETRY AND 3D PRINTED MODEL ALLOWS THE SKULL TO BE ARCHIVED

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The use of CT is a commonly known approach in the investigation of mummified bodies. It allows 2D images to be obtained and 3D graphic reconstruction. The images can be analyzed for morphological characteristics and pathological changes. They can be also used for anthropometric analysis of the skull and can even replace the real skull in superimposition tests. Nonetheless they cannot replace the skull in the physical sense. The study presents the use of the modern imaging techniques in the identification of a mummified body. The aim of the study was to obtain the maximum possible amount of information and biological profile of the mummy using forensic anthropological methods, thus an autopsy was performed and computed tomography scans were taken. The images from the CT were digitally processed to reconstruct the skull and then to obtain a 3D printed skull model. Validation of the 3D printed skull using a series of anthropometric measurements completed the investigation. It was concluded that the printed replica of the skull fully represents the original 2D and 3D images. The interdisciplinary investigations revealed the usefulness of digital imaging techniques in postmortem studies and personal identification of mummified bodies. As far we know, the digital reconstruction of a skull resulting in a 3D printed model of the skull had never been performed in our country before. Technological advances in printing make this possible for the first time. The use of the replica enables sensitive and delicate material of mummified remains to be saved and allows further research to be undertaken without any intervention to the museum exhibit. The durability of the model and its resistance to damage guarantee the persistence during transport and enable the repeated use of replica. As a model is more durable and less likely to be damaged in transit, it can be used to preserve skeletal evidence, be examined repeatedly in further identification procedures and duplicated for research and educational

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