RSNA Radiological Society of North America
RADIOLOGICAL SOCIETY OF NORTH AMERICA
820 JORIE BLVD, OAK BROOK, IL 60523
TEL 1-630-571-2670 FAX 1-630-571-7837
RSNA.ORG
NEWS

The Art of Imaging Methods - Using Micro-CT to Uncover the Secrets of Ancient Ivory Manikins

Thursday 12:45-1:15 PM | HP227-SD-THB1 | HP Community, Learning Center, Station #1

PURPOSE

Ivory anatomical manikins, allowing the extraction of individual organs, are thought to have been carved in Germany in the late 16th or 17th century. While these manikins may have been used for the study of medical anatomy, little is known about their origin. Our institution holds the largest collection of these manikins (22 out of 180 known manikins worldwide). This study aims is to utilize micro-computer tomography (mCT) scanning to investigate the composition of these anatomical manikins. In particular, we hope to determine the ivory type, appreciate repairs and alterations (like pins and screws) that are not visualized by the naked eye, and allow more precise estimations of their age.

METHOD AND MATERIALS

Complete mCT scans of all 22 manikins were performed on an XT H 225 ST Nikon Micro-CT scanner at 150-200 kV with an average exposure time of 267 msec and a slice thickness of 40-80 micrometers. Comparison mCT images of whale bone, deer antler, mammoth/elephant ivory, and rhinoceros horn were extracted from the existing literature. Axial mCT slices of all 22 manikins were evaluated to determine the ivory/bone composition/source, as well as materials other than ivory/bone, such as repairs and pins used in hinging mechanisms.

RESULTS

Twenty out of 22 manikins were made from ivory alone, one figurine was made of antler material and one figurine contained both ivory and whale bone (Figure 1). Metallic components (pins, linings) were found in four manikins and fibers (e. g. 'umbilical cords', Figure 1) were found in two manikins. Eleven manikins contained hinging mechanisms or internal repairs with ivory pins. Trade routes are being analyzed by archeologists to narrow down the time period in which these manikins may have been produced.

CONCLUSION

mCT can be used to identify the different components of fragile archeological manikins. This may enable archeologists to draw conclusions concerning their origins, and further make 3D-renderings and subsequent 3D-prints possible.

CLINICAL RELEVANCE/APPLICATION

Medical imaging methods can benefit arts and archeology significantly by revealing the composition of fragile historical pieces, allowing better understanding of object age, and making these pieces more readily accessible to 3D-printing.