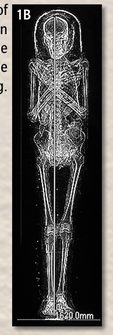
CT FINDINGS OF HEN
CAZENOVIA LIBRARY'S ANCIENT EGYPTIAN MUMMY

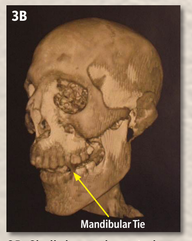
1B: This is a low detail x-ray of the mummy's entire body taken by the CT scanner as the mummy passed through the gantry opening.



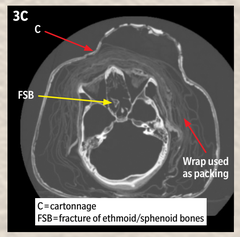
1A: In this illustration, the mummy passes horizontally through the CT scanner opening and 0.5 mm thick overlapping cross-sectional (axial) scans were taken. These were used to create 3-D images of the head and pelvis as well as images of the body in the frontal and lateral planes. Post-processing software enabled soft tissue reconstruction that displayed his facial features and male genitalia.

2: Sample of Wrapping. Carbon dating showed the wrapping to be 2110 years old (+/- 40 years) in 2006 corresponding to 104 BC. Chemical analysis showed the wrapping to be made from flax. Based on the appearance of the hips and teeth, the estimated age of the mummy at death was 20 years.

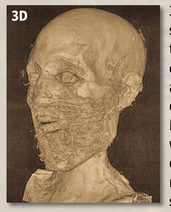
3A: Photograph of the cartonnage (mask) and upper torso. The diagonal wrapping is characteristic of the Greco-Roman Period 332 to 30 BC.



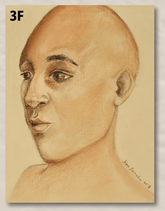
3B: Skull shows elongated head (scaphocephaly) and Class 2 overjet (overbite) deformity.
A string (yellow arrow) between the upper and lower jaws was used to keep the mummy's mouth closed.



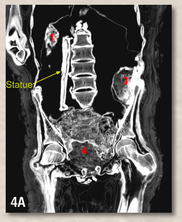
3C: Axial (cross-section) scan through the base of skull shows the face rotated to the right and the cartonnage to the left. Fracture of the cribriform plate of the ethmoid bone and of sphenoid bone (yellow arrow) allowed the brain to be extracted through the mummy's nose during preparation.

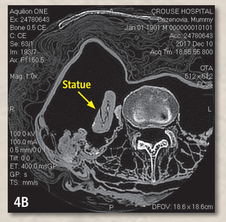


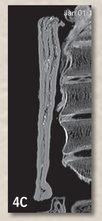
3D: CT reveals soft-tissue detail of the face. The ear cartilage, the nose and the dehydrated eyes are still visible. Much of the wrapping has been electronically removed with CT software to allow visualization of facial structures.



3E, 3F: Artist's reconstruction of the of the mummy's dehydrated face after mummification (Fig 3E) and artist's impression of his face during life (Fig 3F). This is based on the CT appearance of figure 3D.





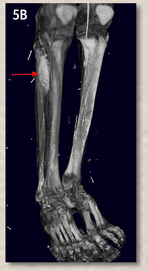


4A: During the mummification process, the organs (lungs, liver, stomach, and intestines) were removed and separately mummified. They were then returned to the body cavity, typically in four separate canopic bags. Often one to four variations of the statue of the God Horus were included. One such statue (yellow arrow) is seen in the mummy's abdomen on the right side. In earlier times, the organs were placed into canopic jars and mummified separately and then placed either within or alongside of the mummy.

4B: Axial CT image shows that the statue was made by folding the construction material creating overlapping layers and then shaping the head and foot.

4C: Sagittal CT image shows that the isolated reconstructed statue resembles either the falcon or jackal headed form of the God Horus. A 3D printing showed identical findings.

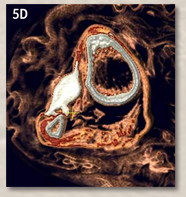
4D: Sagittal CT image shows bright material within the statue's folds possibly representing either glaze or sand.

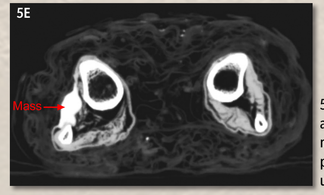


5A: Coronal scan through a calcified mass just below the knee shows the proximity of a scarab (yellow arrow) placed in the wrapping near the mass. The scarab, also known as a "Dung Beetle" was used mystically to help heal abnormalities in preparation for the mummy's afterlife.

5B: Oblique CT scan shows a plaque-like calcified mass (red arrow) which is suggestive of a bone tumor.

5C: Color photo of an Egyptian scarab.



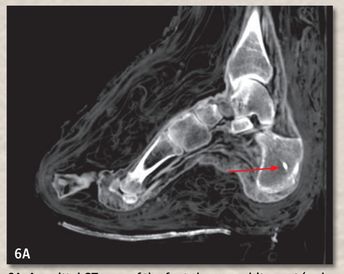


5D, 5E: Axial scans at the level of the mass shows its proximity to the underlying bone.

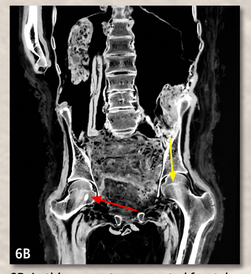
5F: Surgical needle biopsy of the mass. Needle biopsy of the right thigh done in 2006 and of the left thigh in 2017 showed degenerated muscle. Further analysis in 2006 and 2017 showed deteriorated biological DNA.

5G: This image shows a needle piercing the mass.

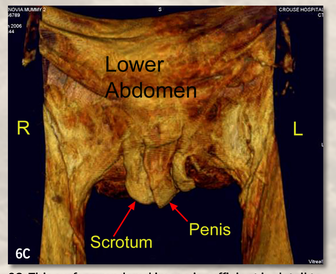
5H: The force used in biopsing the mass in 2006 caused it to fracture. This was noted on the CT examination of 2017.



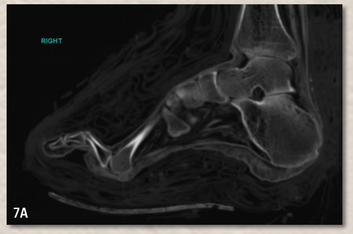
6A: A sagittal CT scan of the foot shows a white spot (red arrow) in the calcaneus (heel) bone. This represents a benign bone abnormality called an "island" that is commonly seen in clinical medicine today. The mummy had 4 benign bone islands.



6B: In this computer generated frontal view of the abdomen and pelvis, a similar bone "island" (red arrow) is seen in the right femoral neck. The growth plate (yellow arrow) in the upper femur corresponds to that of a 20-year-old male.

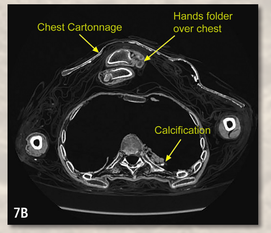


6C: This surface rendered image is sufficient in detail to recognize the male gender.



7A: This sagittally reconstructed image shows an abnormally high arched foot with hammer toe deformity which was present bilaterally. These findings indicate an 80% likelihood of the mummy having Charcot-Marie-Tooth disorder which caused him to walk with an abnormal gait. We see this disorder today in clinical medicine.

7B: This axial scan through the lower level of the chest shows an abnormal calcification (arrow) at the base of the left lung. This likely represents a scar from previous lung infection (possibly TB).



8A, 8B: The black appearance within most of this mummy's discs indicates gas resulting from dehydration associated with mummification. We commonly see this in elderly patients today from degenerative disc disease with naturally occurring disc dehydration.

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Department of Medical Imaging: CT Department, Crouse Hospital, Syracuse, NY: Patrick Hoffstead, RT, (R), (CT), (ARRT).
Contributing Radiologist: Stuart Singer, MD, Crouse Radiology Associates, Division of Interventional Radiology, Syracuse, NY.
Facial Reconstructive Artist: Susan F. Levinsohn-Stone, BS, MD.
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