# A CHILD'S MUMMY

*by David Hunt*

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The new National Museum of Natural History's exhibition *Eternal Life in Ancient Egypt* includes a physical anthropological research study of a child's mummy. To recreate a biological profile of the child, Smithsonian scientists applied modern CT scanning techniques to learn about the child's sex, age, health, and possible ancestral origins. They also employed facial reconstruction techniques to gain a fuller visual understanding of the child.

The museum's collections records indicate that this child's mummy was collected from Thebes by John Hamilton Slack in 1856. Sometime after 1860, the mummy was transferred to the Wistar Institute in Philadelphia, where it was curated until 1958, when the mummy was transferred to the National Museum of Natural History.

An initial visual assessment of the mummy identified various features that could be used for evaluating the remains. For example, the child's body is dehydrated, the tissues treated with a drying agent evidenced by differential coloration and the remnants of crystalline and resinous material. In the embalming procedure, the body would have been dried by placing it in a mound of natron (a type of salt) for 20-30 days. After that time, the natron would have been removed and the body would have been cleansed with unguents (ointments). A bitumen mixture would have been applied as a sealing layer to the tissue.

The child's chest and abdominal region are collapsed, indicating that no apparent packing of this area was done to fill out the body. The body is not wrapped in linen strips; the lack of evidence of any strip-type wrappings adhering to the body suggests that they had been removed in the past. The body — lying on layers of linen sheets with the head tilted downward and with the chin resting on the upper chest — is typical of burials for common (or lower) social class Egyptians from the very late dynastic and Greco-Roman period. The bodies of even common Egyptians were preserved since mummification was an integral part of the Egyptian religion; there had to be a place for the "ba" spirit to reside.

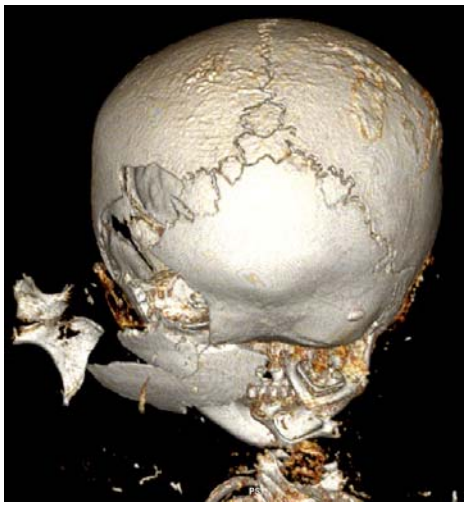
In the early 20th century, necropsy was regularly performed to study a mummified body, but in the process the dissection severely damaged the mummy. With the advancements in radiographic methods, the internal features of the mummy now can be well illustrated without damage, using plain film radiography and Computer Assisted Tomography (CT) to produce a 3-dimensional image. CT was developed in the 1970s, and, like the x-ray machine,

Egyptian child mummy. Photographs by Don Hurlbert. NMNH Department of Anthropology, P381235.

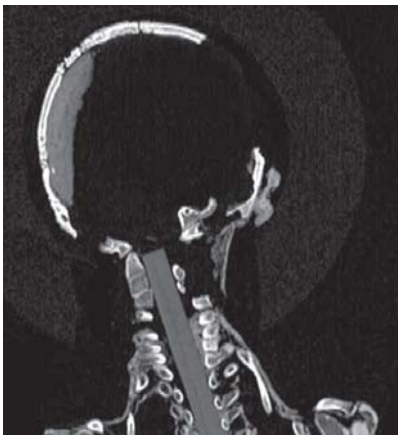
The child mummy being CT scanned.

was used on Egyptian mummies almost from its inception (Petrie, 1898; Lewin 1978).

In Ancient Egypt there were no coolers, so bodies might begin decomposing before the embalmers began their work on them. In this particular mummy, the back of the head had been fractured, perhaps as part of the method of removal of the brain. But it is more likely that the cranial bones had been fractured when the body was being moved and stored before embalming. This fracture and the probable slight decomposition of the body required that the embalmers install a small wooden peg (or



Displaced bone from a skull fracture can be seen on left side of the cranium.



Wood peg or dowl was placed in neural canal of the neck vertebrae.

dowel) in the neural canal of the neck vertebrae to re-position the neck and the head for the mummification. One interesting artifact from the use of x-rays is the imaging of the old catalog numbers placed on the mummy's head. The numbers are written on the mummy with lead-based paint.

Despite the significant drying of the soft tissues by the mummification procedure, there is evidence of external genitalia in the groin area that identifies the body as male, and the length of the mummified body indicates this is a child. Without this soft tissue evidence, it would be impossible to identify the sex of the mummy by the skeletal remains alone.

But how old was this young boy? The two most diagnostic ways to determine age from the skeleton are by dental development and long bone growth. CT scans of


Child mummy face showing the catalog number written on the head.

dentition reveal the developmental stages of the deciduous and permanent teeth in the child's mouth.

From the CT image it is evident that all the deciduous teeth are fully erupted (in occlusion), from the central incisors to the last deciduous molar. Above and below the deciduous dentition are the crowns and roots of the permanent teeth forming. As is illustrated in the image, the permanent maxillary (upper) incisors have their crowns completely formed. The mandibular (lower) canines have the crown about two thirds formed, and the first permanent maxillary (upper) molar has the crown completely formed. The root has just begun to form. Comparing these stages of dental growth to a standardized chart of dental growth, it can be seen that the tooth development is at about three and one half years old +/- 12 months (Bass 2005: 303-4).

CT images of the dentition of the child mummy.

Radiographs of the boy's lower legs also helped scientists conclude that the child died at approximately 3-4 years of age based on long bone development standards (Sheuer and Black, 2000:416). However, teeth provide the best estimate of a child's age since tooth eruption is more strongly controlled by genetics, whereas the long bones and overall body growth are affected by environment or nutritional fluctuations. Since the age estimation of the child's dentition and long bones are equivalent, and there is no other evidence of pathological conditions in the skeleton, it can be concluded that this three- to four-year-old child was not suffering from excessive nutritional or chronic illness. Most likely the child died of some acute illness such as pneumonia or another illness that killed the individual quickly.

Stages of tibial diaphysis and epiphysis growth and related ages. The mummy's tibia length is approx. 3 ¼ to 3 ¾ years old. Tibial growth image from Ubelaker (1999).

To what population might the child have belonged? Ancient Egypt was a very cosmopolitan society, especially in the latter parts of the dynastic periods and in the Greco-Roman occupation. A broad range of population groups were living and interacting during this time and the co-mingling of different population groups would have of-

Comparison of European, African, and West Asian skulls.

Skull of the child mummy compared to anterior and lateral views of European, African and Asian ancestry skulls (previous page).

ten occurred. Examining the cranial features of the Egyptian child — the shape and height of the nose, shape of the eye orbits, amount of forwardness of the face (prognathism), and length and breadth of the cranial vault—his ancestry appears to be intermediate between the West Asian and African. This is not surprising since the Egyptian populations of that time would have been an amalgam of African populations from the previous Nubian rule and the influx of Middle Eastern groups occurring at the same time that the Greeks and Romans had political control.

Though no longer living, this young boy still speaks to us across thousands of years, thanks to the new analyses of his mummified remains made possible by recent scientific advances. The case study thus provides us with one of the strongest arguments for the retention of museum collections — one simply never knows when scientific breakthroughs will bring us new knowledge and insight about our world, past and present.

## References

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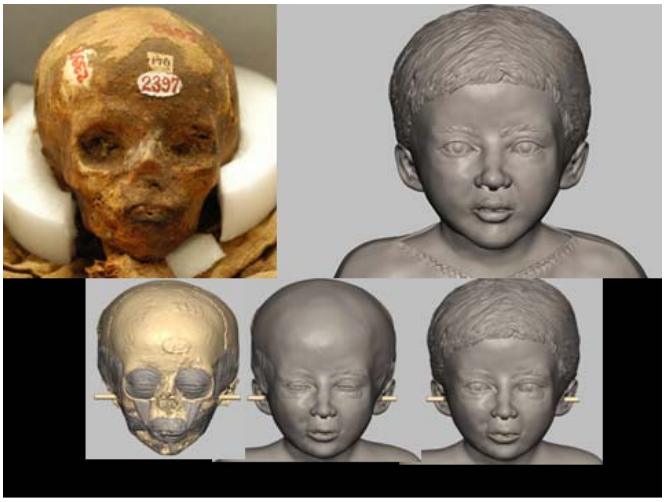


The application of forensic anthropology and new x-ray technologies has enabled forensic artist and sculptor Joe Mullins to reconstruct the boy's head based on the assessed ancestry and age. Using the 3D CT image, he virtually built layers of muscle and skin onto the skull, ultimately building facial features using FreeForm Virtual 3D modeling software.

Ubelaker, D.H. 1999. *Human Skeletal Remains: Excavation, Analysis and Interpretation.* Manuals in Archeology, No.2. Taraxacum.

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