

# **Scientists digitally 'unwrap' mummy of pharaoh Amenhotep I for the first time in 3,000 years**

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Facemask of the never-before unwrapped mummy of pharaoh Amenhotep I.  
Credit: S. Saleem and Z. Hawass

All the royal mummies found in the 19th and 20th centuries have long since been opened for study. With one exception: egyptologists have never been bold enough to open the mummy of Pharaoh Amenhotep I. Not because of any mythical curse, but because it is perfectly wrapped, beautifully decorated with flower garlands, and with face and neck covered by an exquisite lifelike facemask inset with colorful stones. But now for the first time, scientists from Egypt have used three-dimensional CT (computed tomography) scanning to 'digitally unwrap' this royal mummy and study its contents. They report their findings in *Frontiers in Medicine*.

This was the first time in three millennia that Amenhotep's [mummy](#) has been opened. The previous time was in the 11th century BCE, more than four centuries after his original mummification and burial.

Hieroglyphics have described how during the later 21st dynasty, priests restored and reburied royal mummies from more ancient dynasties, to repair the damage done by grave robbers.

"This fact that Amenhotep I's mummy had never been unwrapped in modern times gave us a unique opportunity: not just to study how he had originally been mummified and buried, but also how he had been treated and reburied twice, centuries after his death, by High Priests of Amun," said Dr. Sahar Saleem, professor of radiology at the Faculty of Medicine at Cairo University and the radiologist of the Egyptian Mummy Project, the study's first author.

"By digitally unwrapping of the mummy and 'peeling off' its virtual layers—the facemask, the bandages, and the mummy itself—we could study this well-preserved pharaoh in unprecedented detail," said Saleem.



The pharaoh's mummy, showing his shrunken skull and skeleton within the bandages. Credit: S. Saleem and Z. Nuwass



"We show that Amenhotep I was approximately 35 years old when he died. He was approximately 169cm tall, circumcized, and had good teeth. Within his wrappings, he wore 30 amulets and a unique golden girdle with gold beads."

"Amenhotep I seems to have physically resembled his father: he had a narrow chin, a small narrow nose, curly hair, and mildly protruding upper teeth."

Saleem continued: "We couldn't find any wounds or disfigurement due to disease to justify the cause of death, except numerous mutilations *post mortem*, presumably by grave robbers after his first burial. His entrails had been removed by the first mummifiers, but not his brain or heart."

The mummy of Amenhotep I (whose name means 'Amun is satisfied') was discovered in 1881—among other reburied royal mummies – at the archeological site Deir el Bahari in southern Egypt. The second pharaoh of Egypt's 18th dynasty (after his father Ahmose I, who had expelled the invading Hyksos and reunited Egypt), Amenhotep ruled from approximately 1525 to 1504 BCE. His was a kind of golden age: Egypt was prosperous and safe, while the pharaoh ordered a religious building spree and led successful military expeditions to Libya and northern Sudan. After his death, he and his mother Ahmose-Nefertari were worshipped as gods.



The pharaoh's skull, including his teeth in good condition. Credit: S. Saleem and

Z. Hawass

Sahar Saleem and her co-author egyptologist Dr. Zahi Hawass, had previously speculated that the main intention of the restorers from the 11th century was to reuse royal burial equipment for later pharaohs. But here they disprove their own theory.

"We show that at least for Amenhotep I, the priests of the 21<sup>st</sup> dynasty lovingly repaired the injuries inflicted by the tomb robbers, restored his mummy to its former glory, and preserved the magnificent jewelry and amulets in place," said Saleem.

Hawass and Saleem studied more than 40 royal mummies of the New Kingdom in the Egyptian Antiquity Ministry Project that was launched since 2005. Twenty-two royal mummies, including that of Amenhotep I, were transferred in April 2021 to a new museum in Cairo. The face of the mummy of Amenhotep I with its mask was the icon of the spectacular 'Royal Golden Mummy Parade' on March 3rd, 2021 in Cairo.

"We show that CT imaging can be profitably used in anthropological and archeological studies on mummies, including those from other civilizations, for example Peru," concluded Saleem and Hawass.

**More information:** Sahar N. Saleem et al, Digital Unwrapping of the Mummy of King Amenhotep I (1525–1504 BC) Using CT, *Frontiers in Medicine* (2021). [DOI: 10.3389/fmed.2021.778498](https://doi.org/10.3389/fmed.2021.778498)

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