

# The Royal Mummies of Ancient Egypt: an odyssey of discoveries and a fascinating source of data

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## Abstract

Thanks to mummification, the physical remains of many rulers of ancient Egypt are still observable today and constitute a valuable source of information. By evaluating the age at death and sometimes elucidating the degree of kinship and circumstances of death, our knowledge of ancient Egyptian history becomes more precise. Different pathologic conditions have been found and the evolution of the mummification process can be seen through time. The most spectacular discovery was that of Tutankhamen's mummy, the single totally undisturbed tomb, associated with a fabulous treasure. The mummy of Ramses II has been extensively studied, the only one that flew to Paris where an irradiation was delivered in order to eradicate a destructive fungal infection. The identification of Akhenaten's mummy and the explanation for his peculiar appearance are still unsolved problems. Noticeably, many Royal mummies remain of uncertain identity or undiscovered hitherto.

## Introduction

Thanks to mummification, physical remains of many rulers of Ancient Egypt are still observable today albeit often damaged by tomb robbers, transportation or inadequate unwrapping. We propose here a short review reporting historical and paleopathological data and also some anecdotes, mysteries and hypotheses from the study of Royal Mummies. We will focus on the nearly complete series of New Kingdom Mummies from Dynasty (Dyn.) 18 to 20.

### **The forearm of Zer (Or One of His Wives), DYN. I, 3100-3055 BC**

More than 100 years ago, Petrie and Mace found in the tomb of King Zer the most ancient pharaoh's remain discovered so far (Petrie, 1901). Unfortunately, it has never

been carbon 14 dated. The only picture of these remains was probably that of WF Petrie (Fig. 1). The bones have been lost and the four bracelets of gold and faience are still exposed at the Egyptian Museum of Cairo. However, for some scholars, these bones could belong to a woman (Zer's wife?) (Dunand and Lichtenberg, 2002). Interestingly, one bracelet was of Turquoise originating from the Sinai, which may indicate that this region was part of the Egyptian Kingdom at this period (Grimal, 1988).

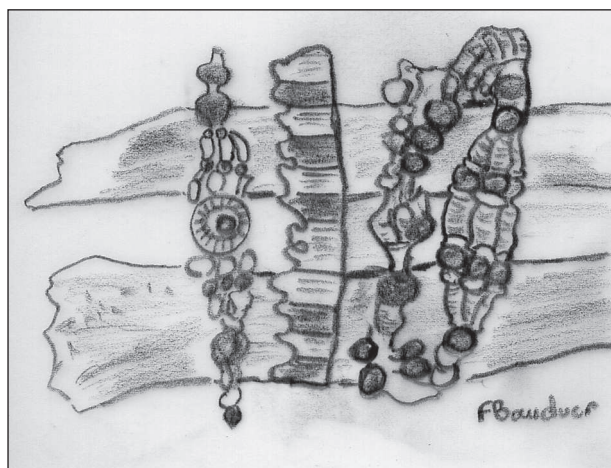


Fig. 1 - The right forearm of King Zer (or one of his wives) with bracelets, Dyn. I (drawing of F Bauduer from the original picture of WF Petrie, Petrie Museum, London).

### **Old and Middle Kingdom Mummies, DYN. 4-13, 2628-1638 BC**

Very few have survived due to the very long time elapsed, the primitive techniques used and because of pyramids robbers. Usually, only body parts are available except for Merenre (son of Pepi I), Dyn.6, Saqqara, whom mummy is complete (Brier, 1999; Dunand and Lichtenberg, 2002).

### **The rise of the New Kingdom: the violent death of Seqenenre, DYN. 17**

Seqenenre seems to be the only king killed by violence. He was probably attacked by at least two individuals armed with axe and spear which represented the typical Hyksos

weapons. Six wounds are evidenced to the head and neck and one can see a palsy of the left hand indicating that this man is not dead immediately. The death probably occurred on the battlefield against Apophis (this explaining the rapid and basic mummification) or, for others scholars, the Pharaoh was murdered during his sleep (Smith, 1912; Brier, 1999).

### **New Kingdom Mummies, DYN. 18-20, 1550-1070 BC**

They correspond to an about five hundred year period during which Kings were buried in the King Valley near Thebes. Mummies were later transferred to caches (Deir-el-Bahri or the tomb of Amenhotep II) by priests during the Dyn. 21, in order to avoid tomb plundering. They were often rewrapped and placed in coffins originally made for other Pharaohs. They are nearly all available today (Brier, 1999).

*Ahmose I (son of Seqenenre), founder of the Dyn. 18*

The mummy of Ahmose I is interesting to consider because this is the first one to have the brain removed by left side of the neck before the advent of the classical technique through the nostrils (Smith, 1912).

*Members of the Tuthmose (I to IV) lineage, Dyn. 18*

They share the same facial aspect. The mummy of Tuthmose I (successor of Amenhotep II) was the first to enter the King Valley and is not conclusively identified because his coffin was usurped by Pinedjem I (Dyn. 21). Tuthmose II was succeeded by his wife and half-sister Hatshepsut. His mummy presents with cutaneous plaques of uncertain significance. The oblique abdominal incision for embalment was first realized on the mummy of Tuthmose III (Smith, 1912). Tuthmose IV's mummy has a very thin appearance, probably related to a devastating disease, and was the first one to be X-rayed in 1904 by Elliot Smith.

*Is the mummy NFM-M5 that of Ramses I, founder of Dyn. 19?*

Ramses I's mummy was not in the corresponding coffin in the Deir-el-Bahri cache. In May 1999, a mummy (NFM-M5) originally acquired near Luxor by Colonel Sydney Barrett in the 1860's was bought (with a collection) for 2 Million \$ by a small Canadian museum. Afterwards, property of the Museum of the Emory University in Atlanta, the head of the specimen NFM-M5 was studied using reconstructive computerized photography. A marked resemblance with Seti I and Ramses II was noted and some American specialists raised the hypothesis that this mummy was that of Ramses I. Of note, it was initially dated from ptolemaic or third intermediate period considering mummification procedures and carbon 14. Only DNA comparative studies could permit to give more precise conclusions.

*Other members of the Dyn. 19*

Seti I (1304-1290 BC), Ramses II (1290-1224 BC) and Merneptah (1224-1204 BC) representing three generations of the Dyn. 19, share the same appearance in profile. Longevity and arteriosclerosis characterize the last two ones. The mummified head of Seti I is probably the most beautiful among the Royal Mummies and is often considered as a symbol of serenity and dignity facing the death. Ramses II

«The Great» is the most famous ruler of Ancient Egypt. He died at about 85-90 after 67 years of reign (he had more than 100 concubins and about 200 children!). His mummy showed evident signs of deterioration since the beginning of the 20th Century in relation with the multiplication of visits. In 1976, this mummy flew to Paris in order to be treated. He was admitted at the Musée de l'Homme after having passed beside his own obelisk originally located in Luxor and now in the middle of Place de la Concorde in Paris. The physical check-up revealed a marked kyphosis (Desroches-Noblecourt, 1996). Changes in the mummy's spine and pelvis were initially attributed to ankylosing spondylitis but a recent radiological reappraisal suggests the diagnosis of diffuse skeletal idiopathic hyperostosis (Forestier disease) (Chhem et al., 2004). A cervical fracture had been made during the embalment. The Pharaoh was red-haired, a theoretical unacceptable characteristic in Ancient Egypt. On xeroradiograph, one could evidence an animal bone and seeds in the nose to prevent fluttering induced by bandages, severe dental abscesses (perhaps the cause of the death) and important cerebral arteriosclerosis. Ironically, the diagnosis of the mummy deterioration was made by a chemist of Egyptian origin (fungal infection due to *Daedalea biennis* among about 60 types of moulds!). It was decided to irradiate the mummy using gamma X-rays (<sup>60</sup>Co). This treatment was able to kill these microorganisms without macroscopic deleterious side-effects. After being "cured" Ramses II went back home and arrived at the Cairo Museum under a sterile protection (Desroches-Noblecourt, 1996).

*«The Elder Lady» identified as Queen Tiye*

The identification process of the so-called "Elder Lady", one of the three mysterious corpses of the Amenhotep II cache, is interesting to tell. This mummy was found by Loret in 1898, and identified 75 years later as Queen Tiye, by hair comparison using a hair lock from this Queen found in a small coffin within the tomb of her grand-son Tutankhamen (Brier, 1999). Akhenaten: in search of a mummy in order to solve the riddle of his peculiar appearance

We haven't yet identified the mummy of Amenhotep IV or Akhenaten, the "Heretic Pharaoh" who is usually represented with an acromegaloid facies and a female-like appearance (Fig. 2).



Fig. 2 - Statue of Akhenaten showing a feminine morphology and an acromegaloid facies (Egyptian Museum, Cairo).

Several hypotheses have been proposed to try to explain these peculiar physical features. First, the art representations have to be considered as cartoons or symbols of androgyny of God Aten, the only god adored at this period, both mother and father of the human kind (Aldred, 1988). Second, Akhenaten was in fact a woman. Third, this king had an illness (Aldred, 1988; Burrige, 1995) including some kind of endocrinopathy (for instance Froelich's syndrome or acromegaly) or other various disorders (Marfan syndrome, Klinefelter syndrome (XXY)). Of note, this condition did not probably induce sterility considering the fact that Akhenaten fathered six children. Anyway, it is difficult to conclude in the absence of the corresponding mummy. DNA testing and skeletal morphology on the relatives could offer some clues for elucidating this problem.

#### *Tutankhamen: facts and myths*

Everybody knows the story of the discovery of Tutankhamen tomb by Carter and Lord Carnarvon in 1922. It is so far the only totally undisturbed mummy who was associated with a fabulous treasure, including the famous mortuary gold mask, the leading figure of the Cairo Museum. Of note, beside the mummy of the young king died at about 19 years, two female foetuses were found, perhaps resulting from miscarriages of Ankhesenamun, Tutankhamen's wife. The so-called "malediction of the Pharaoh" legend was built from the early death of Carnarvon after a mosquito bite. Tutankhamen's head and his X-ray were compared to the skull from the KV 55 tomb discovered in 1907 by Weigall and Ayrton. Giving this striking similar peculiar cranial shape, this skull was probably that of Semenkare his half-brother (first identified as Akhenaten or Queen Tiye) (Brier, 1999).

#### *Siptah, Dyn. 19*

This mummy of a pharaoh died at about 20 years, albeit damaged by grave robbers, reveals some insights in the process of mummification. It is the first to have the embalmer's incision sewn together. In addition, cheeks were filled out with linen and body cavity with lichen. This mummy is famous for the shortened left leg which led to various interpretations: polio, club foot, cerebral palsy or simple artefact of mummification (Smith, 1912; Brier, 1999).

#### *Ramses III, Dyn. 20*

Ramses III is believed to be the last great pharaoh before the progressive fall of the empire. His mummy is the first to have artificial eyes made by linen packing. Moreover, it was used as model for the original version of the movie "The Mummy" in 1932, starring Boris Karloff (Brier, 1999).

#### *Ramses V, Dyn. 20*

The mummy of Ramses V presents with many cutaneous vesicles on the face and the abdomen. A diagnosis of smallpox was proposed by many scholars (including Ruffer

(1921) and more recently Strouhal (1996)) albeit immunological and electron microscopic studies were not conclusive (Lewin, 1982). Concerning the mummification procedure, internal organs have been replaced in the body with sawdust which represents an uncommon finding before the Dyn. 21 (Smith, 1912).

### **Third Intermediate Period, DYN. 21-23, 1069-727 BC**

Regarding mummification methods, the third intermediate period is characterized by a sophistication of procedures with respect to facial reconstruction and viscerae embalment (Brier, 1999). However, "more was not always better" as shown on the burst face of Queen Henettowey, Dyn. 21. She was the wife of Pinodjem I (found in the Deir-el-Bahri cache). This is a good example of failure of embalment techniques introduced during the Dyn. 21 which used under skin stuffing in order to give a life-like appearance. In addition, during this period, viscerae were embalmed separately and inserted within the abdomen. In this mummy, a gold plaque had been placed on the abdominal orifice (Smith, 1912; Brier, 1999).

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