

## The breasts of Tutankhamun

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### ABSTRACT

Despite being an obscure pharaoh who ruled for a very short time, Tutankhamun, the boy king, has reigned popular consciousness since the discovery of his tomb in 1922. To endocrinologists, the depiction of the kings of the 18<sup>th</sup> dynasty in an androgynous form complete with gynecomastia has been a source of intrigue and academic curiosity. Many explanations abound. But is the depiction just stylized art? Or did the kings indeed have familial gynecomastia, or aromatase excess with craniosynostosis. An inspired team of researchers used molecular genetic tests to truly lay the Tut controversy to rest.

**Key words:** Antley–Bixler syndrome, aromatase, gynecomastia, history of endocrinology, Tutankhamun

The opening of the obscurely numbered KV62 tomb in the valley of kings in 1922 by Howard Carter<sup>[1]</sup> and the discovery of the intact remains and glorious artifacts which accompanied the boy king Tutankhamun to his afterlife was the beginning of a romance of popular imagination with all things Egypt.

Tutankhamun's reign was brief as he died in the ninth year of his reign; he left no heirs and was buried in a tomb that was designed for a private person; it was forgotten till 1922. In 1980, Bernandine Paulshock published a special communication in the JAMA that began, "there is a statue among the recently exhibited relics of Tutankhamun that shows him with such well defined breasts that were it not for the uniquely pharaonic headgear, it would readily be called an image of a young woman" [Figure 1]. King Tut's breasts have fascinated endocrinologists' psyche since the early 1970s.<sup>[2]</sup>

Portal hypertension and ascites secondary to schistosomiasis



**Figure 1:** Tutankhamun. Photo Credit ©Andreas F. Voegelin, Antikenmuseum Basel, and Sammlung Ludwig

were the earliest simple explanation,<sup>[2]</sup> but do not explain the findings in the young king. Adrenal tumor,<sup>[3]</sup> Klinefelter's, and Wilson's syndromes were other speculations but did not explain the fact that gynecomastia was not King Tut's problem alone.

Tutankhamun succeeded (possibly after few intervening years by the notorious Smenkhare) Akhenaten, a bizarre visionary who turned away from Amun and other established Gods of the Egyptian pantheon and established a new capital at Amarna. Akhenaten started a new cult that

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worshiped a single deity Aten (the disk of the sun). The art of this period took a revolutionary new naturalism; the pharaoh was no longer depicted with an idealized face and youthful, muscular body as were pharaohs before him, but as strangely androgynous, with a potbelly, thick lips, elongated face, and, of course, gynecomastia.

Paulshock called to attention evidence of gynecomastia in the extended family based on the images of Thutmose IV (Akhenaten's grandfather), Amenophis III (Akhenaten's father), Amenophis IV (Akhenaten), Smenkhare, and Tutankhamun. She speculated that Tutankhamun had autosomal dominant familial gynecomastia of an unknown cause. Subsequently, Braverman *et al.* ventured further and suggested that the kings of the 18<sup>th</sup> dynasty had aromatase excess syndrome. Aromatase excess results in gynecomastia, eunuchoid habitus, a mellifluous voice (that Akhenaten was supposed to have had), and normal fertility. Affected women have isosexual precocious puberty and macromastia. Indeed a sister of Akhenaten, the 5-year-old Princess Meketaten is depicted with enlarged breasts and prominent buttocks. Statues of two sisters of Akhenaten demonstrate similar sexual precocity. The depictions of pharaohs of the 18<sup>th</sup> dynasty also demonstrate what could be craniosynostosis of the sagittal suture resulting in an elongated skull overhanging the occiput and long neck.<sup>[4]</sup> Older CT scans of Tutankhamun seemed to confirm this.

When you apply Occam's razor to these disjoint findings, endocrine and cranial abnormalities, you get a syndrome. Braverman's group bestowed on Tutankhamun and his forefathers the diagnosis of the Antley-Bixler syndrome, a genetic disorder with features described above that involved abnormal estrogen steroidogenesis and craniofacial abnormalities resulting from a mutation in the POR gene which encodes P450 oxidoreductase.

And the mystique would have remained or continued to inspire imagination till the bubble was pricked in a remarkable study that used molecular genetics in 10 mummies to establish kinship and lineage of Tutankhamun and his many ailments.<sup>[5]</sup> A reexamination showed that the penis of Tutankhamun, which is stored separately is well developed; the chest is missing from the mummy due to preservation as is the pelvic bone. Newer CT scans revealed that he and Akhenaten had brachycephaly and not dolicocephaly. The only feminine feature was the somewhat strong appearance of the iliac bones and the

greater sciatic notch, which was slightly pronounced. The genes of Tutankhamun told a definitive story. There was no evidence of a genetic mutation of P450 or others suggesting gynecomastia or other inherited endocrinopathies. The molecular evidence revealed a somewhat weak king who used a cane to walk because of a bone necrosis, painful Kohler's disease, oligodactyly in the right foot and a club foot in the left (no wonder he was buried with numerous walking sticks). He was chronically affected by plasmodium falciparum but no exotic endocrinopathy!

So what explains the gynecomastia in the depictions? Akhenaten switched allegiance from Amun and a pantheon of Gods to a monotheistic form of worship that honored Aten, an androgynous deity who embodied the male and the female. The king usurped the title of the living God and by extension had images of him and his lineage made to the likeness of Aten. The images were symbolic and not realistic depictions. But you cannot deny the fact that we had lots of fun trying to decode the disease they depicted.

Tutankhamun died childless. Two fetuses buried with him are probably his, born of incest (another story another day). The dynasty is continued by the marriage of his queen Ankhesenamun to the son of a Hittite king. The child of that marriage is Ramses I who is considered to be one of the greatest pharaohs of Egypt.

Molecular biology and genetics solved a century old mystery! The genes of Tutankhamun came back from a long slumber to solve it. The romantic in me however wishes that it were never solved. I now have one less yarn to tell my class.

## REFERENCES

1. Tut DN. National Geographic, September 2010. Available from: <http://www.nationalgeographic.com>. [Last accessed on 2011 Oct].
2. Paulshock BZ. Tutankhamun and his brothers. Familial Gynecomastia in the Eighteenth Dynasty. JAMA 1980;244:160.
3. Weller M. Tutankhamun: An adrenal tumor? Lancet 1972;2:1312.
4. Braverman IM, Redford DB, Mackoviak PA. Akhenaten and the strange physiques of Egypt's 18<sup>th</sup> dynasty. Ann Intern Med 2009;150:556-60.
5. Hawass Z, Gad YZ, Ismail S, Khariat R. Ancestry and pathology in king Tutankhamun's family. JAMA 2010;303:638-47.

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