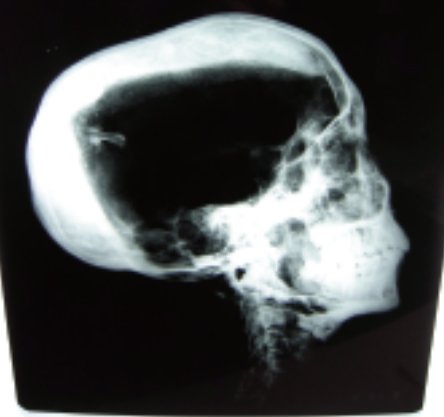


In the 1960s, X-rays of Tutankhamen's body taken by scientists from Liverpool University seemed to support the hypothesis that he was killed by a blow to the head – but technology has moved on in the intervening years, and these same X-rays recently helped to rule this out as the cause of death.

Bone of contention

Liverpool University X-ray of Tutankhamen's skull



We tend to think of ancient people leading short, brutal lives, but privileged members of some cultures lived nearly as long as people in developed countries can expect to live today: in Egypt, for instance, one 18th dynasty pharaoh ruled for over fifty years, and several ruled for more than thirty years.

Towards the end of this dynasty, though, there was a run of very short reigns. Smenkhkare, Ay and Tutankhamen managed only fifteen years between them and all three seem to have died unexpectedly. Given that they lived over 3,000 years ago, diseases or accidents seem the most likely causes, but murder is also a possibility – and many scholars have argued that the boy king, Tutankhamen, was assassinated. After the mummy was unwrapped,

Another Tutankhamen puzzle

There are many mysteries surrounding Tutankhamen – and one of them concerns his parents. An inscription records that he was a king's son – but which king? And who was his mother? It is unlikely that we will be able to extract enough tissue from high-profile mummies to obtain their DNA, but some years ago Robert Connolly tried to resolve these questions using his expertise in blood typing.

Blood is not preserved by mummification, but our blood group is determined by certain chemical characteristics of our red blood cells. These molecules are found in most tissues, as well as blood, and they are very resistant to biological degradation. This means that it is possible to blood type small samples of soft tissue taken from Egyptian mummies. Robert Connolly had already capitalised on this by blood typing several bodies from the 18th dynasty – including Tutankhamen's.

THE CHIEF SUSPECTS

Most scholars think that Tutankhamen's father was either Amenhotep III or his son, Akhenaten. This means his mother could have been one of Akhenaten's wives, or Amenhotep's favourite wife, Tiye – or possibly his daughter, Sitamun, as there is evidence to suggest that Amenhotep married her, too.

The remains of Tiye, Sitamun and Akhenaten have yet to be found, as have Akhenaten's wives.

his body was found to have a major injury to the chest and small fragments of bone inside the skull.

TELL-TALE LINE?

Protected by a sheet of glass, Tutankhamen's body lies in his stone sarcophagus in the burial chamber of his tomb in the Valley of the Kings. It was there, in 1968, that fifty X-rays were taken by Liverpool University photographer, Lyn Reeve, supervised by the University's Professor of Anatomy, Ronald Harrison, who had an international reputation for his work on the reconstruction of ancient bodies.

Most of the X-ray plates were taken to Liverpool to develop. When Professor Harrison examined one of the skull radiographs, he found that it showed two lines on the back of Tutankhamen's skull, where there would normally be only one. This could have resulted from calcification of the skull membrane following a blow, and this, in conjunction with the skull fragments, encouraged some scholars – and the media – to argue that Tutankhamen was murdered.

HYPOTHESIS DISPROVED

Robert Connolly, a physical anthropologist in the University's School of Biomedical Sciences, is now the guardian of these radiographs. He was recently able to enhance and copy them, thanks to technological advances. When he analysed the improved images, he realised why there seemed to be an extra line on the back of Tutankhamen's skull. "The head wasn't orientated square to the X-ray plate – which isn't surprising, since they were

working in very difficult, cramped conditions", he says. "As a result, we've got a slightly oblique image which captures a small portion of the other side of Tutankhamen's skull. It gives the impression there's an unusual line on the skull – but that's not the case."

Robert Connolly also established that the small bone fragments found in Tutankhamen's skull had been dislodged from the top of his neck, not his head. "It could have happened during the mummification process", he says, "but these fragments are not caught in the resin which the priests used to preserve the body, so it's more likely that they were displaced during the autopsy performed in the 1920s."

Taken together, these two discoveries disprove the hypothesis that Tutankhamen was killed, accidentally or through foul play, by a blow to the head. What's more, the radiographs contain no evidence at all that he was murdered.

Robert Connolly published his findings in 2003. Earlier this year his conclusions were confirmed independently by Tutankhamen's first CT scans.

The body in the bog

A man cutting peat from a Cheshire bog made a gruesome discovery in 1984: a lower leg, severed at the knee, and three parts of a foot. The Serious Crime Squad then found the upper body.

Since the skull of a murdered woman had been found in the same peat bog two years earlier, the Home Office pathologist asked Robert Connolly, a physical anthropologist from Liverpool University, whether they were all part of the same body. When he arrived at the scene, he recognised immediately that they were dealing with an ancient and very special body.

"This was quite clearly Britain's first bog body", he recalls. "Over time, the composition of the peat bog turns the skin into leather, so it holds the body together and protects the fragile, demineralised skeleton and the internal tissue."

After a detailed anatomical analysis, Robert Connolly concluded that this was the body of a man who had died around 24-30 years of age, weighing about 60kg. He was roughly 5'6" tall, had powerful leg, trunk and arm muscles, a healthy covering of head hair and a beard. He showed no sign of malnutrition, but was beginning to suffer from arthritis.

How did he die? "He had wounds in the top and back of his head", says Robert. "The blow to the back of his head severed his spinal cord. He was wearing a neatly tied thong around his neck. Some people thought this was a garrotte, rather than a necklace – suggesting he was a victim of ritual sacrifice, but there really isn't enough evidence to support this." The Iron Age body, known as Lindow Man, is now in the British Museum.

FURTHER INFO: Contact Robert Connolly at R.Connolly@liverpool.ac.uk