

Richard III was no 'bunch-backed toad', research suggests

Paper published in Lancet says king's scoliosis probably caused him to be shorter but did not cause major physical deformity

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He was English history's most famous hunchback, but a sharp tailor and a skilful armourer may have disguised the curve in his spine, according to experts who examined the skeleton which has been identified as Richard III's. They could not, however, have hidden how short he looked.

Severe scoliosis in the skeleton found under a Leicester car park less than two years ago - and DNA matches with a distant relative of the Plantagenet king - helped to confirm "beyond reasonable doubt" the identity of the remains. They are now bound for reinterment in the nearby cathedral following a failed legal challenge by descendants who favoured York minster as his final resting place.

But research funded by Leicester University and published in the Lancet medical journal on Friday suggests the king's disfigurement was probably slight because a "well-balanced" sideways curvature in the spine would have meant his head and neck were straight, not tilted to one side.

Although the king's torso would have been short relative to the length of his arms and legs, and his right shoulder a little higher than his left, a good tailor and custom-made armour could have minimised the "visual impact" of his condition, according to the paper.

There was no evidence that Richard would have walked with an obvious limp; his leg bones were symmetric and well-formed. Neither would the disease, which probably developed when Richard was an adolescent, have reduced his ability to exercise.

The researchers have already established that Richard would have been about 5ft 8in (1.7m) tall without his scoliosis, about average for a medieval man, although his condition meant he would have appeared several inches shorter. Tudor propagandists, especially Shakespeare, ensured Richard has been seen as hunchbacked for centuries.

The findings by experts at Leicester, Cambridge and Loughborough universities and the University Hospitals of Leicester NHS trust follow CT scanning of Richard's spine, with 3D reconstructions of each bone being made from the digital model. The team used a 3D printer to create polymer replicas of each vertebra, which were then put together to recreate the shape of Richard's spine during his life. This was photographed from 19

different points and the pictures stitched together digitally.

Jo Appleby, the osteoarchaeologist who excavated Richard's skeleton, said: "Obviously, it was flattened out when it was in the ground. We had a good idea of the sideways aspect of the curve, but we didn't know the precise nature of the spiral aspect of the condition.

"The arthritis in the spine meant it could only be reconstructed in a specific way, meaning we can get a very accurate idea of the shape of the curve. It's good to be able to produce this 3D reconstruction rather than a 2D picture, as you get a good sense of how the spine probably did not cause a major physical deformity."

Phil Stone, chairman of the Richard III Society, which helped fund the dig which found the king's remains, said the research confirmed "the Shakespearean description of a 'bunch-backed toad' is a complete fabrication".

"History tells us Richard III was a great warrior. Clearly, he was little inconvenienced by his spinal problem and accounts of his appearance, written when he was alive, tell that he was 'of person and bodily shape comely enough' and 'the most handsome man in the room after his brother, Edward IV'."

Fighting the recent court case cost the Ministry of Justice, which granted the exhumation licence, £82,000, the city council £85,900 and Leicester University £70,158. The cathedral authorities, as interested parties, paid £7,000. None of them can claim any money from the Plantagenet Alliance, which lost its attempt to force a consultation on the king's next destination. The alliance registered as a non-trading shell company before the court battle to avoid legal costs, a move condemned by the justice secretary, Chris Grayling.

. This article was amended on 30 May 2014. It was originally published online with the correct reference to Shakespeare's Richard III being a "bunch-backed toad". This was changed during the editing process for the newspaper to "hunchbacked toad". This has been corrected.

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