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Tyler Eickelmann
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Ancient UK Man with Tuberculosis

by Tyler Eickelmann

(Biology 1152)

ABSTRACT

The complete skeletal remains were excavated in Vindolanda, UK and were found to have *Mycobacterium tuberculosis*, the bacterium that causes tuberculosis. This paper investigates the possibility that Romans introduced tuberculosis to Britain, while also determining the sex, age at death, and cause of death of the individual. Romans invaded Britain for the first time right around the same time that this individual was thought to have died based on carbon dating. It was determined that the individual was male likely between 21 and 35 but possibly as old as 50. Whether the individual died from tuberculosis could not be determined due to the lack of evidence on the skeleton. Tuberculosis was not likely introduced to Britain by the individual since another skeleton was found with an infection that predates the first Roman invasion by several hundred years.

INTRODUCTION

An ancient skeleton was recently discovered in Vindolanda, UK near the vicinity of a Roman castle. Bones were found to carry *Mycobacterium tuberculosis* which leads to the question whether Romans brought the disease to Britain. The first Roman campaign was led by Julius Caesar in 55 and 54 BC (Salway 1981). Caesar first conquered Gaul (modern day France) then proceeded to invade Britain with a reconnaissance force with the intent of shutting down reinforcements to Gaul and safe haven for the Gallians. The Roman army launched a campaign into Britain, winning a few battles along the way, but was subsequently stranded by a storm off-shore which damaged the Roman fleet so much so that the Roman army could not immediately return to Gaul. The Britons knew this and saw it as an advantage since it was late in the season and winter was approaching. The Britons then accepted one of Caesars offers of alliance in exchange for a few hostages which was an attempt delay to war until winter. During this time the Romans and Britons were often in contact with one another, with the Britons working the fields near the Romans camp and Romans collecting food from nearby villages. With the fleet repaired, Caesar returned to Gaul, re-equipped with an expanded army, and defeated the Britons the following year. It is reasonable to consider that these two interactions between Romans and Britons was when Tuberculosis was introduced to Britain.

Tuberculosis has affected humans since the transition from hunter-gatherers to agriculturists around 8000 BC (Finer 2003). The close proximity between people in larger settlements and cities provided an ideal habitat for the contagious bacterium. Tuberculosis first appeared in the archeological record in Egyptian mummies dating to 2400 BC, later in Greek literature, and then in Roman literature (Finer 2003). The purpose of this study was to investigate the possibility that Romans introduced tuberculosis to Britain, while also determining the sex, age at death, and cause of death of the skeleton.

METHODS

Carbon dating was used to date the skeleton. Gender was determined by examining the pelvis the shape of the greater sciatic notch, the shape of the pelvic inlet, and the shape of the subpubic angle (Byers 2002, Leong 2006, Pearson 2011, Walker-Pacheco 2010). Additionally, the method that measured three points on or around the mastoid process; the porion, the asterion, and the mastoidale, from both the right and left sides. Then the sum of the area from the two triangles that

formed was calculated and based on the result being either between 1248mm² and 1855mm² for male and between 942mm² and 1475mm² for female (Paiva and Segre 2003).

Age at death was estimated by the degree of tooth eruption and epiphyseal union of the distal femur, the femoral head, the humeral head, and the medial clavicle by looking for the presence of a line or lack thereof. The extent of closure of the cranial sutures also was taken into account.

Cause of death was investigated by examining for signs of disease and trauma. Macroscopic observations were made of the postcranial skeleton, searching for signs of pathogenic wear. To investigate the possibility of tuberculosis in England having Roman origins research was done on Roman activity in Britain during the time the individual is thought to have died and also on the earliest cases of tuberculosis in England (Mays and Taylor, 2003).

RESULTS AND DISCUSSION

Carbon dating indicated the skeletal remains were 2068 ± 4 years old (sample mean ± standard error) which places individual's time of death possibly earlier than Caesar's first expedition to Britain, or at least around the same time. Observations of the pelvis revealed a very angular and narrow subpubic angle as opposed to being wide and rounded. The greater sciatic notch also appeared very narrow and the pelvic inlet was heart shaped opposed to oval. All of these observations pointed to the individual being male (Byers 2002, Leong 2006, Pearson 2011, Walker-Pacheco 2010). The sum of each of the triangles formed from both the right and left mastoid processes was 1803mm² which was well above the mean for males, further evidence that the individual was male (Paiva and Segre 2003).

The individual had all of his adult teeth fully erupted including the third molars indicating the individual was older than 18 (Byers, 2002). Further, the epiphyseal lines of the distal femur, the femoral head, the humeral head, and the medial clavicle were all completely obliterated. This evidence suggests that the individual was at least 21 years old particularly because of the medial clavicle which is the last of the bones to complete epiphysis, on average at around age 25 but sometimes not until age 31 (Byers 2002, Walker-Pacheco 2010). Still there was not enough evidence to conclude he was older than 21 since the rate at which epiphysis occurs varies slightly between individuals. The lack of closure of the cranial sutures suggests that he was younger than 35 but due to the variability in this method, he may have been as old as 50. Hence, the age range for the individual at the time of death was between 21 and 50.

Macroscopic observations of the post cranial skeleton indicated several areas damaged by the tuberculosis bacterium. The most obvious was the proximal sides of the femoral neck (Figure 1) which had lesions and was somewhat porous. In addition the anterior side of the sternum (Figure 2) and the right side of the axis (Figure 3) showed extensive porosity (Buikstra 1981, Matos and Santos 2006). Though the skeleton did show signs of pathogenic wear, none of it was particularly significant so it cannot be confirmed from the skeleton that the individual died from the disease. Death was undetermined. Another skeleton with TB dated back to two to four centuries before the Vindolanda man was thought to have lived, predating the first Roman invasion which indicates that the Romans did not introduce the bacterium to Britain (Mays and Taylor, 2003).

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Figure 1-Lesions of the Femoral head



Figure 2-Porosity of the Sternum



Figure 3-Porosity of the Axis

