

An investigation of 19th century pertrochanteric fracture and its probable relation to osteoporotic disorders

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As part of a broader research project aiming to recover and study the remains of the famous castrato Carlo Broschi, better known as Farinelli (1705-1782), this study focused on the skeleton of Maria Carlotta Pisani, Farinelli great-niece. Maria Carlotta died on January 4, 1850 at the age of 81 years and was buried in the historical cemetery of Certosa, Bologna, in the same tomb with his great-uncle's remains. The skeleton, exhumed on July 2006, appeared poorly preserved on account of the microclimatic conditions of the tomb and water infiltration. It revealed pathology on the proximal end of the left femur, which was recorded as an extracapsular pertrochanteric fracture probably due to a non-union fracture that likely caused locomotor problems. The patient did not undergo surgical treatment. We performed a detailed paleopathological macroscopic examination of the fracture pattern, along with morphological, radiological and chemical analyses of this alteration. Our data allowed to hypothesize that: 1) Maria Carlotta survived at least several months after sustaining the fracture, as shown by the degree of remodeling and repair processes at the bony callus region; 2) the bone presented major *ante mortem* pathological modifications in terms of reduced cortical thickness, altered trabecular microarchitecture and low bone mineral density; 3) a preexisting osteoporosis could have acted as a comorbid condition associated with age related fracture in an elderly woman.

To our knowledge, there are only few descriptions in paleopathological literature of such a fracture which onset could be related to age progressive conditions of loss, deterioration and weakening of bone. Our report sustains the claim that, even if rare, this pathological condition could have affected past populations as well and investigating such historical cases may have significant implications for current interpretations.

Key words

Pertrochanteric fracture, osteoporosis, morphology, paleopathology