



# DIFFERENTIAL DIAGNOSIS OF AN UNUSUAL LOWER LEG PATHOLOGY IN AN IMPERIAL ROMAN



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## BACKGROUND AND CONTEXT

A suite of skeletal pathologies was discovered on the remains of an older adult male from Imperial Rome.

The cemetery of Casal Bertone dates to the 2<sup>nd</sup>-3<sup>rd</sup> centuries AD and was situated in a periurban area just outside the city walls of Rome. The burial program included a large necropolis with simple inhumations in pits and a *cappuccina* as well as an above-ground mausoleum with niches for single and multiple burial. Archaeologically associated with the cemetery are a large villa, a network of plumbing, and a 1,000 m<sup>2</sup> building with almost 100 tubs each one meter in diameter, likely a fullery for cleaning cloth.<sup>[1]</sup>

Individual F10A (Male, 50+) was buried in a niche in the mausoleum, suggesting higher social status than those in the necropolis and/or membership in a funeral guild. No grave goods were found associated with him, however. Over 75% of the skeleton was recovered from the burial.

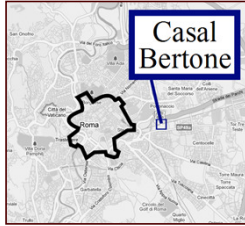


Fig 1. Map of Rome

## SKELETAL PATHOLOGIES

F10A had a number of pathological conditions. He lost most of his teeth antemortem. Significant arthritic changes (porosity, lipping, osteophytes) were noted in his TMJ, shoulder, elbow, hip, and knee joints, as well as in the thoracic and lumbar spine. No rhinomaxillary changes were seen.

The bones of his legs present pathologies inconsistent with solely age-related changes:

- *L tibia* - remodeled periostitis of the postero-medial aspect of the shaft; posterior aspect thickened, with spicules of bone; no evidence of cloacae; tibia is heavier than normal; periostitis and osteophyte formation at fibular notch
- *R/L fibulae* - osteophyte formation on lateral aspect of proximal ends; periostitis on shafts; remodelling of distal ends
- *Tarsals* - osteophytes and porosity of L calcaneus, L navicular, and L cuboid (at the MT4/5 articulation)
- *Metatarsals* - resorption of proximal end and destruction of head of L MT5; resorption and porosity at proximal end of two other L MTs; distal end of R MT1 significantly resorbed; resorptive foci in distal R MT5; additional resorptive changes in two other MTs, both proximally and distally



## DIFFERENTIAL DIAGNOSIS

Several possible diseases could have caused lytic lesions to the feet and legs of F10A.<sup>[2]</sup>

- *Leprosy* - Erosive changes in the feet, particularly the tapering of the metatarsal heads, are similar to those seen in leprosy. The classic rhinomaxillary changes associated with leprosy were not seen in the skull, although F10A was missing most of his teeth. Leprosy is unlikely but cannot be ruled out.
- *Sarcoidosis* - Granulomatous bone lesions also occur in the phalanges with sarcoidosis, but the metatarsals are less often affected. F10A has only a few phalanges, but the distribution of lesions does not suggest a diagnosis of sarcoidosis.
- *Rheumatoid Arthritis* - Lytic lesions are common in RA, which often affects the skeleton symmetrically, especially the hands. F10A's foot lesions are symmetrical and erosive, but tarsal and metatarsal joints are not commonly involved in RA. Still, RA or another erosive arthropathy cannot be ruled out.<sup>[3]</sup>
- *Mycetoma* - Multiple lytic foci characterize the skeletal involvement in this infection. Most often affected are the metatarsal, tarsal, and ankle joints, but the tibia and fibula can also become infected. The widespread, almost bubbly lytic lesions of F10A's feet strongly suggest mycetoma.

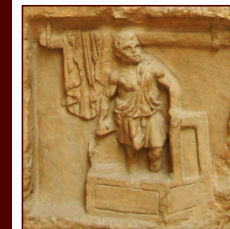


Fig 2. *Saltus fullonicus*  
Relief from Museo della Civiltà Romana

## MYCETOMA

Mycetoma (or Madura foot) is a longstanding, progressive infection often found in populations that go barefoot and engage in agricultural work. It is endemic to the region between 15°S and 30°N latitude but has also been reported in southern Italy and Greece.<sup>[4]</sup> Migration during the Roman Empire, including importation of slaves, means that pathogens

were not necessarily confined to one location.

The Roman fullery involved large tubs of caustic liquid, in which fullers would stamp cloth while barefoot—a task called the *saltus fullonicus*—which suggests a possible link between lower leg pathology and occupation. Yet mycetoma is difficult to diagnose in ancient remains. A possible case from 4<sup>th</sup> century AD Israel<sup>[5]</sup> was later found to have leprosy.<sup>[6]</sup> No such testing has been done on F10A to date.

Osteological data, archaeological context, and geographic location suggest a diagnosis of mycetoma for individual F10A, but it is difficult to conclusively rule out leprosy and rheumatoid arthritis.

## REFERENCES

- [1] Musco et al. 2008. Le complexe archéologique de Casal Bertone. *Les Dossiers d'Archéologie* 330:32-39. [2] Ortner 2003. *Identification of Pathological Conditions in Human Skeletal Remains*. [3] Killgrove 2010. *Migration and mobility in Imperial Rome*. [4] A. Plehn 1928. Madurafuss. In Kollé & von Wassermann *Handbuch der Pathogen Mikroorganismen*, pp. 113-132. [5] Hershkovitz et al. 1992. Unusual pathological condition in the lower extremities of a skeleton from ancient Israel. *AJPA* 88(1):23-26. [6] Spigelman & Donoghue 2001. Brief Communication: Unusual pathological condition in the lower extremities of a skeleton from ancient Israel. *AJPA* 114(1):92-3.

## BONES SHOWN

- Top row - L tibia, medial; proximal fibulae; distal fibulae  
Middle row - L navicular; L cuboid; L calcaneus  
Bottom row - L metatarsals; R metatarsals

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Weigh in on this diagnosis or download the poster:  
<http://www.tinyurl.com/KillgrovePPA>