



## Physical Anthropology Section – 2007

### H9 Paleopathological Diagnosis of Leprosy in Skeletons From a French Medieval Leper

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After attending this presentation, attendees will understand that the paleopathology of leprosy can be very useful in the understanding of the past history of the disease and use this understanding to predict its course in the future. The study of skeletons may enrich the relatively poor osteological documentation of leprosy in Middle Age in Europe.

This presentation will impact the forensic community and/or humanity by discussing the excavation of a sample of human skeletons from a medieval leper site that has provided the largest sample from this period in France. The findings that 45% of the skeletons buried in the Saint-Lazarus chapel of Tours suffered from leprosy will provide a unique opportunity to interpret historical sources, medical documents, and osteoarcheological data regarding medieval leprosy.

**Introduction:** Leprosy is a chronic granulomatous infectious disease caused by *Mycobacterium leprae*. According to documentary sources, leprosy was a relatively common occurrence in later Medieval Europe. It seems to have culminated in the 13th and 14th centuries when around one quarter of the adult population died with signs of leprosy. However, the number of cases diagnosed in archaeologically derived skeletal material from all areas of Europe is low. When leprosy affects the skeleton, a number of specific and non-specific bony changes occur during the pathogenesis. In the present study, all the bone lesions in the skeletons from 57 tombs of the necropolis of the Saint-Lazarus chapel (Tours, France) in relation to a diagnosis of leprosy are described and discussed.

**Material and Methods:** The Saint-Lazarus chapel appears to have been in use from the 12th to the 17th centuries and was known to have been a medieval leper colony. The excavated skeletons were found during a building construction in 1993. In total, 57 burials were identified. The 57th burial was in fact identified as scattered remains from disturbed burials. Sex and age for all burials were determined according to current anthropological methods. All the bone lesions were noted by two different observers. Pathognomonic skeletal changes of low resistance (lepromatous) leprosy included erosive changes of the anterior nasal spine, resorption of the alveolar ridge with frequent loss of incisor teeth and palatal perforations (*facies leprosa*). A variety of secondary skeletal changes may develop due to peripheral neural involvement by the infectious process. The most characteristic of these are trophic reabsorptive changes in the terminal phalanges of the feet and hands. The phalanges frequently are the site of other absorptive changes which lead to "shark-tooth" deformities. Periostitis of the tibiae and fibulae may be the consequence of ascending secondary infections or of periosteal involvement by the primary infection.

**Results:** 39.3% of the skeletons were males, 21.4% were females, 14.3% were adolescents. Sex determination was not possible for 25% of the individuals. Rhinomaxillary changes were noted for 45% of the available skulls: among them there were seven cases of nasal spine atrophy, six irregular perforations of the superior surface of the hard palate and 2 central atrophy of the maxillary alveolar process two skeletons presented acro-osteolysis of the 5th metatarsal. Periostitis of the tibiae and fibulae was found on five skeletons. Enthesophytes and osteolytic lesions were noted at the insertion sites of several ligaments. Cribra orbitalia was found on two individuals.

**Discussion:** Only 45% of individuals known to live in a medieval leper colony had pathognomonic lesions of the disease, although leprosy sufferers were banished and removed from society. There may be many reasons for this. First if people contract the high resistant (tuberculoid) form of the infection they may not develop any bone changes. Second, people with leprosy may have died before there was time for bone change to occur. In both these scenarios, the evidence would be absent skeletally. Thirdly, leprosy may have been misdiagnosed: people with another disease may have been labeled as leprous. A number of other diseases that may produce the same skeletal lesions are discussed.

**Paleopathology, Leprosy, Facies Leprosa**