



## Letter to the Editor

## Possible new evidence of pre-Columbian tuberculosis in America: Pott disease in a prehistoric Mexican statue



## ARTICLE INFO

## Keywords:

Paleopathology  
Infectious disease  
Retrospective diagnosis  
Gibbosity

## ABSTRACT

The authors present a case of a probable Pott disease from central/southern Mexico, dated 300 BC to 500 AD. This case highlights the importance of iconotopsy/iconodiagnosis for a better description of the natural history of diseases, especially as a complement to morphological analyses of human remains (paleopathology) and laboratory exams (DNA or immunology testing).

## 1. Introduction

Information about diseases in the past is often acquired through studies on human remains (paleopathology, including paleo-microbiology), but also from written records, paintings, drawings and carvings (iconotopsy or icono-diagnosis). Artistic and cultural manifestations are often more related to the artist's personal inspiration, but sometimes remarkable disfiguring diseases became the subject portrayed by many ancient societies. Using this context applied to visual literacy as a technique to study visual representations, focusing on archaeological and paleo-epidemiological studies, is a non negligible way to make scientific contributions.

## 2. Material and method

The 'patient' corresponds to a 20-cm-high Mexican statue portrayed at the Museum of quai Branly - Jacques Chirac, Paris (N° Inv. 71.1882.17.95) (Fig. 1). That figurine is in the Mezcala style (from central Mexico and Guerrero), and dates from the pre-classical period (300 BC – 500 AD). It is carved in hard green stone, and characterized by fine-polished geometric forms.

The anthropomorphic image of a man with a hat was typically used by pre-Columbian Mexican societies. The character's posture is bent in flexion, creating an image of an abnormal excessive curvature of the spine in the thoracic and sacral regions. Considering the absolute unusual posture of the depicted subject (all others are standing or sitting, but without this important bulge in the back), a retrospective diagnosis of Pott disease is proposed, based upon the authors' medical knowledge and clinical experience.

## 3. Results

This acute dorsal kyphosis, is reminiscent of spinal deformity similar to that caused by advanced spinal tuberculosis (TB), also known as Pott disease [1]. Although a kyphotic upper back is often seen in Pott disease, it can also (but much more rarely in this chrono-cultural context) result from degenerative diseases such as pyogenic spondylitis, brucella

spondylitis, sarcoidosis, arthritis, developmental alterations, osteoporosis with vertebral compression fractures, lymphoma, multiple myeloma, metastasis or trauma [2].

It has been proved that TB existed in the Americas at least 2000 years before Christopher Columbus [3], reasonably linked to seal tuberculosis (*Mycobacterium pinnipedii*) [4]. Due to a probable low susceptibility against *Mycobacterium tuberculosis* among the natives, researchers believe that the occurrence of TB in pre-Columbian Americas was rare or even did not exist in some parts of the Continent. Paleopathological studies from the last 30 years have now collected enough evidence of the existence of TB in prehistoric North and South America. Indeed, cases of prehistoric TB were reported in South America (Andes of Chile and Peru, coast of Venezuela), in Central America (Mexico and USA) [5–8]. A further diagnosis was provided from a terra-cotta figurine from the post-classical period (900–1521 C.E) found in an archaeological site in Yucatan, Mexico, featuring gibbous deformity, typical of Pott disease [9].

## 4. Conclusion

The technique of visual literacy (iconotopsy or icono-diagnosis) was used to analyze a pathological aspect provided by a pre-Columbian statue. The importance of visual literacy for physicians is the practice of observation and reasoning for clinical diagnosis. This technique, which offers diagnoses with more or less important margins of certainty, is a complement to morphological examination of skeletons (anthropological and paleopathological diagnosis) and to microbiological laboratory studies on old samples (genetics, immunology, etc.).

In this case, it allows us to contribute to the health mapping of ancient Americas, and to propose the presence of tuberculosis (without it being possible to differentiate *Mycobacterium tuberculosis* or *bovis*) in the central zone of Mexico and in Guerrero between 300 BC and 500 AD.

## Conflicts of interest

None for both authors, related to the subject of this article.



Fig. 1. Lateral view from the anthropomorphic figure from Mexico with strong gibbosity (picture by Philippe Charlier).

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.tube.2019.03.011>.

#### References

- [1] Garg RK, Somvanshi DS. Spinal tuberculosis: a review. *J Spinal Cord Med* 2011;34(5):440–54.
- [2] Roberts CA, Buikstra JE. *The bioarchaeology of tuberculosis*. Gainesville, FL: University Press of Florida; 2003.
- [3] Gómez i Prat J, de Souza SM. Prehistoric tuberculosis in America: adding comments to a literature review. *Mem Inst Oswaldo Cruz* 2003;98(Suppl 1):151–9.
- [4] Bos KI, Harkins KM, Herbig A, et al. Pre-Columbian mycobacterial genomes reveal seals as a source of New World human tuberculosis. *Nature* 2014;514(7523):494–7.
- [5] Daniel TM. The origins and precolonial epidemiology of tuberculosis in the Americas: can we figure them out? *Int J Tuberc Lung Dis* 2000;4(5):395–400.
- [6] Salo WL, Aufderheide AC, Buikstra J, Holcomb TA. Identification of *Mycobacterium tuberculosis* DNA in a pre-Columbian Peruvian mummy. *Proc Natl Acad Sci USA* 1994;91(6):2091–4.
- [7] Allison MJ, Mendoza D, Pezzia A. Documentation of a case of tuberculosis in Pre-Columbian America. *Am Rev Respir Dis* 1973;107(6):985–91.
- [8] Arriaza BT, Salo W, Aufderheide AC, Holcomb TA. Pre-Columbian tuberculosis in northern Chile: molecular and skeletal evidence. *Am J Phys Anthropol* 1995;98(1):37–45.
- [9] Mackowiak PA, Blos VT, Aguilar M, Buikstra JE. On the origin of American tuberculosis. *Clin Infect Dis* 2005;41:515–8.

P. Charlier\*

*Museum of quai Branly - Jacques Chirac, 222 rue de l'Université, 75007, Paris, France*

*UFR of Health Science (EA4498 DANTE Laboratory, UVSQ), 2 avenue de la Source de la Bièvre, 78180, Montigny-Le-Bretonneux, France*  
E-mail address: [philippe.charlier@quaibrnly.fr](mailto:philippe.charlier@quaibrnly.fr).

P.D. Deps

*Department of Social Medicine, Post-graduation of Infectious Diseases, Health Science Center, Federal University of Espírito Santo, Vitória, ES, Brazil*

\* Corresponding author. Museum of quai Branly - Jacques Chirac, 222 rue de l'Université, 75007, Paris, France.