A 2000 Year-Old Cold Case: the Violent Death of a Roman Mariner Between Archaeology and Forensic Anthropology

N. Franchi[1], F. Bartoli[1], M. Borrini[2]

[1] University of Pisa, Unit of Anthropology, Department of Biology, Via Volta 6, Pisa, Italy. E-mail: fbartoli@biologia.unipi.it
[2] University of Florence, Italian Academy of Forensic Science

KEY WORDS: physical anthropology, forensic anthropology, mariner, Pisa.

Introduction

During archaeological excavation of the Roman port of Pisa in 1999, two skeletons came to light, laden down by a Roman ship, sunk and partly preserved, probably caused by a disastrous flood in the river Auser. Skeletons belonging to an adult male and a small dog resembling the present Dachshund breed, were recovered. The canine rested on the man's left upper limb at the forearm level. This 2000 year-old cold casehas been investigated using physical and forensic anthropological techniques which allowed us to define the biological profile of this subject: including the sex, age, height, and skeletal pathology. The taphonomic analysis of bones and the context as a possible *crime scene* lets us understand the decomposition and death dynamics revealing the causes of the partial dismemberment. The case presented is an example the physical anthropology as a discipline useful for the analysis of skeleton human remains, and as a useful tool in the reconstruction of ancient events and bio-archaeological data in synergy with forensic sciences.

Materials and Methods

The human skeletal remains alone were analyzed. Thanks to an optimum environment for fossilization, they were preserved in perfect conditions. The anthropometric assessment has followed the new Italian protocol "*for the anthropometric measurement of human skeletal remains for forensic use*" inspired by and based upon the traditional Martin-Saller methodology (Martin and Saller, 1956-1959). The estimation of sex has used both the Acsàdi-Nemeskèri method (Acsàdi-Nemeskèri, 1970) and the Walker method (Walker, 2008); the human group, to which this skeleton probably belongs, has been evaluated using Fordisc®, an innovative software for forensic use and the Hefner method (Hefner, 2009). The estimation of the age, using Meindl-Lovejoy method (Meindl and Lovejoy, 1985) alongside another method used in the forensic field, the Brooks-Suckey method (Brooks and Suckey, 1990). The height of the subject has been calculated with the Trotter and Gleser method (Trotter and Gleser, 1952) and with the Fordisc® software; the ergonomic characters have been determined with Donatelli-Scarsini method (Donatelli and Scarsini, 2008). For the reading of the taphonomic profile have been used photos taken in 1999 by Co.Idra at the moment of excavation and by studying the cast. For the taphonomic profile the investigation has been supported by the aquatic taphonomy.

Results

The data extrapolated by measurement shows that the skeleton is well proportioned and robust; there is evidence of muscular development particularly on the right humerus and ulna as well as the femora and the bones of the feet. The determination of the sex and the human group concluded that the sex is male and the human group is white. An internal option in the Fordisc® software has allowed a comparison with populations studied by Howells in which it has been revealed the subject belongs to a European group and is statistically close to Norwegian male group. The extimated age is around 40 to 45 years and the stature between 161 to 167 cm. The most relevant data taken from the ergonomic evaluation is that the muscles more developed are those used for balance, such as gastrocnemius muscle and those of the sole of the feet. For the place where he has been found we conclude that the subject worked aboard the ship on which he utilized upper limbs which were submitted to a prolonged effort like carrying heavy weights on his shoulders (the hypothesis is based upon the presence of Schmorl's Nodules on the vertebra T10, T11, T12, L1, L2). Dental pathology from the skeleton includes severe occlusal wear of the upper dental arc that has principally involved the incisors.
The subject was recovered in its primary deposition and this has allowed us to reconstruct a highly probable taphonomic profile: the skeleton presents connected joints like mandible, the rotation of the cervical vertebras in the direction of the skull, tibia and fibula, the right ulna and radius; the thorax was intact because of the progressive refilling by mud deposits.
The left foot was found two metres from its astragalus-tibia joint. It's possible that the subject was trapped to the riverbed by timbers of the boat, so much so as to not assume the position typical of a drowning. The lack of

flotation in the water within the presence of adipocere, has favoured the preservation of the joints later still preserved by another probable covering of mud and lime(not predictable in terms of time) that progressively substituted the saponificated covering, thus preserving intact most of the joints and the volume of the thorax. Similar considerations apply for the dog: it emphasizes a possible presence of *rigor mortis* reconstructed on the basis of a arched backbone. In this study were found many fractures at the end of the right ribs embedded by an object, probably a piece of wood from the boat.

Discussion

The above hypothesis suggests that death occurred after a rapid flood caused the overthrow of the ship, when the subject was on the boat with his dog. As is evident from the presence of the load, we find that they were trapped underneath without possibility of escaping. The hypothesis that they were alive when they fell into the water is based partly on the particular position of the backbone of the dog in which we observe a possible presence of *rigor mortis*; the close vicinity with the man himself support that he also may have been alive at the moment of the shipwreck. The piece of wood embedded in the right thorax brings us to believe the piece has reached the body with a straight trajectory at the moment of the impact causing an impalement injury that could be a co-cause of death together with drowning.

References

Acsàdi G., Nemeskèri J. 1970. *History of human life span and mortality*, Budapest.

Borrini M. 2011. *Antropologia Forense: protocollo e linee guida per il recupero e lo studio dei resti umani*, Tesi di Dottorato in Biologia Evoluzionistica ed Ecologia - ciclo XXIII, Università di Roma Tor Vergata.

Brooks S.T., Suchey J.M. 1990. Skeletal age determination based on the Os Pubis: A Comparison of Ascadi Nemeskeri and Suchey-Brooks Methods. *Hum. Evol.*, 5: 227-238.

Donatelli A., Scarsini C. 2006. Proposta di un metodo per il rilievo delle entesopatie, *Archivio per l'Antropologia e l'Etnologia*, Società Italiana di Antropologia e Etnologia, Firenze, CXXXVI.

Hefner J. 2009. Cranial nonmetric variation and estimating ancestry. *J. Forensic Sci.*, 54(5): 985-995.

Martin R., Saller K. 1956-59. *Leherbuch der Anthropologie*, Stuttgart.

Meindl R.S., Lovejoy C.O. 1985. Ectocranial Suture Closure: a revised method for the determination of age at death based on the lateral-anterior sutures. *Am. J. Phys. Anthropol.*, 68(1): 57-66.

Ousley S.D., Jantz R.L. 2005. *FORDISC3.0: Personal Computer Forensic Discriminant Functions*. University of Tennessee.

Trotter M., Gleser G.C. 1952. Estimation of stature from long-bones of American Whites and Negroes. *Am. J. Physical Anthropol.*, 10: 463-514.

Ubelaker D.H. 1997. Taphonomic application in Forensic Anthropology. In: Haglund WD., Sorg MH., *Forensic Taphonomy. The Postmortem Fate of Human Remains*. CRC Press, New York.

Walker P.L. 2008. Sexing skulls using discriminant function analysis of visually assessed traits. *Am. J. Phys. Anthropol.*, 136(1): 39-50.