Case Report: Physical Anthropology

Endocranial mice nesting in the body of the Blessed Antonio da Fano (dead 1435)

Mirko Traversari[1], *Beatrice Demarchi*[2], *Annalisa Biselli*[3], *Francesco Tei*[4], *Elisabetta Cilli*[1], *Gianni D'Altri*[5], *Luca Ventura*[6,7]

[1]Department of Cultural Heritage, University of Bologna, Ravenna; Italy; [2]Department of Life Sciences and Systems Biology, University of Turin, Italy; [3]R.T. Restauro Tessile, Reggio Emilia, Italy; [4]Radiology Unit, "Engles Profili" Hospital, Fabriano, Italy; [5]Indipendent Researcher, Cesena, Italy; [6]Division of Pathology, San Salvatore Hospital, L'Aquila, Italy; [7]Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila, Italy.

Abstract

Aim. Rodents nesting is not frequently described in bioanthropological literature, although it represents a common finding in mummified bodies.

Material and Methods. The partially skeletonized mummy of the Blessed Antonio da Fano (dead 1435) underwent external inspection, digital radiology, and computed tomography scanning. Inner body cavities were inspected through endoscopy.

Results. Traces of rodents nesting were noted and morphologically referred to an adult and a subadult house mice (*Mus musculus*, Linnaeus 1758, subspecies *domesticus*, Schwartz & Schwartz 1943).

Discussion and Conclusion. Our present report represents the first description of rodent nesting occurring in the body of a Saint or a Blessed of the Catholic religion. A short literature review confirm that this instance is not rare and should be carefully checked and described, in order to better understand this occurrence and to plan effective countermeasures.

Key words: rodent, nest, mummy, paleopathology, paleoradiology

Introduction

The bodies of Catholic Saints and Blessed represent a special category of human remains (Fulcheri, 1996). They deserve a special care, and Canonical Recognitions are carried out to verify the authenticity of relics, to guarantee their preservation, and to promote their veneration (Amato & Bartolucci; 2018, Fulcheri, 1991). Scientific investigations on these remains are of particular interest from the bioanthropological and paleopathological viewpoint (Fulcheri, 2013). Nest construction is widespread throughout the animal kingdom. For small rodents, nesting is important for heat conservation, reproduction, and shelter from elements, predators, and competitors (Deacon, 2006; Jirkof, 2014; Bateman, 1982).

Aim of the present study is to describe a rodent's nest found during scientific investigation of the body belonged to a Franciscan friar. To the best of our knowledge, this is the first case of rodents nesting inside the mummified body of a Saint or a Blessed of the Catholic religion.

Material and Methods

In 2019, the body of the Blessed Antonio da Fano was found in the Church of Santa Maria Nuova in Fano, Marche region, central Italy (Fig. 1) (Ventura et al., 2021; Traversari, et al. 2021). During restoration works of the building, a metal coffin dating back to 1959 and holding his mortal remains was found

Figure 1. Position of the church in Fano, Italy. Maps data ©2022 Google.

set into a brick wall (Fig. 2). The coffin and the body were later moved to the Hermitage of Val di Sasso in Valleremita, Fabriano, Marche region.

Subsequently, a thorough bioanthropological and paleopathological investigation was carried out. The body underwent external inspection, digital radiology (GMM Opera Swing system) and total body multidetector computed tomography (CT) using a General Electric Optima 64-slides scanner. Inner body cavities were inspected through a endoscopy device (Bosch® inspection camera GIC 120 C Professional). An anthropometric survey with sampling of representative materials took place shortly after. In the following months, analysis of the biological profile with Age-at-death estimated thanks to degenerative indices and morphological variants of the skeleton and dental wear

Pattern , height (Trotter & Gleser, 1958)., anthropomorphic indices, ergonomic indicators (Capasso et al., 1999) and the study of occupational markers (Mariotti et al., 2004), textile examinations and paleozoological investigations were carried out with the aim of reconstructing the lifestyle, the physical characteristics and better analyzing the taphonomic aspects that occurred after the death of the Blessed, whose life, at least in the documents, is still rather obscure and unacknowledged. Furthermore, the study of the nest intends to shed light on an aspect which, although known to the scientific community, is still probably underestimated and partially misunderstood.

Results

The well-preserved mummy with partially skeletonized chest and arms belonged to a non-slender, Caucasoid, male individual, with an estimated age at death between 45-49 years (Fig. 3). Except for some decomposed regions, a natural mummification

Figure 2. The mummified remains in the metal coffin.

Figure 3. The partially skeletonized mummy of Antonio da Fano.

process occurred through rapid dehydration, in a temperate dry climate. CT scanning and endoscopic examination of the cranial cavity revealed the presence of dense, amorphous material (Fig. 4) containing textile fragments (Fig. 5) and bony remnants of rodents (Fig. 6). Fragments of the textiles taken from the endocranium were composed of animal and vegetable fibers, namely silk and linen. All the textile fragments were made with simple weave or canvas / taffetas. Considering the information obtained from the first analysis, it is difficult to establish a dating for all the fragments, due to the small size and the lack of details related to weaving such as the selvedge or the beginning/end of the piece and the absence of design. However, it is likely that the textiles belong to the subject's primary burial. Bony remnants of rodents included two hemi-mandibles, two skull fragments, and a smaller hemi-mandible, which were morphologically referred to an adult and a subadult house mice (*Mus musculus*, Linnaeus 1758 subspecies *domesticus*, Schwarz & Schwarz, 1943) (Maga et al., 2017; Reitz & Wing, 1999). It is quite possible that the textile fragments were brought into the cranial cavity by rodents.

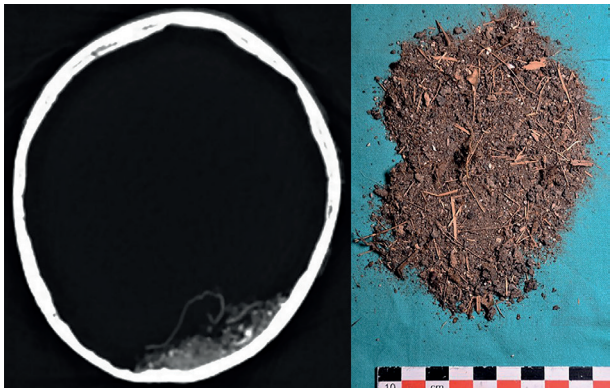

Figure 4. Left: CT scan showing granular dense material in the posterior cranial fossa. Center: endoscopic views of the posterior cranial fossa. Right: material removed from the endocranium.

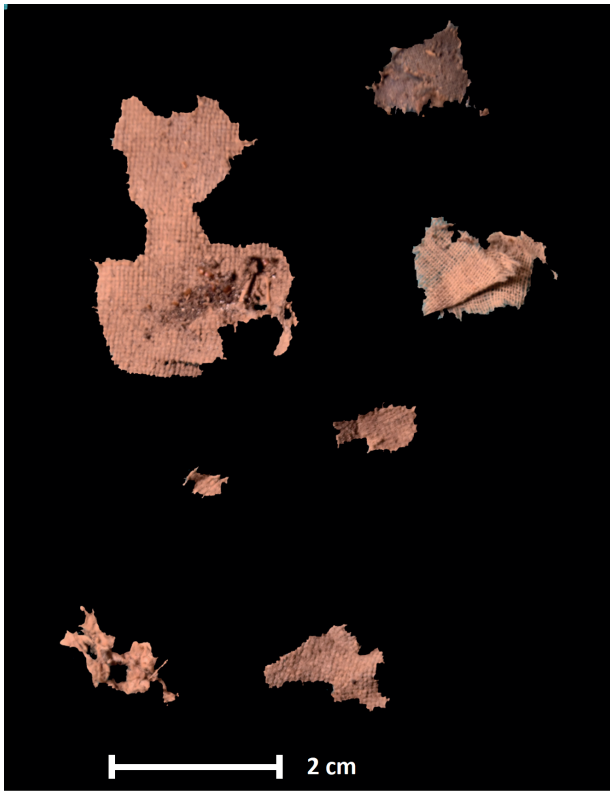

Figure 5. Textile fragments removed from the head.

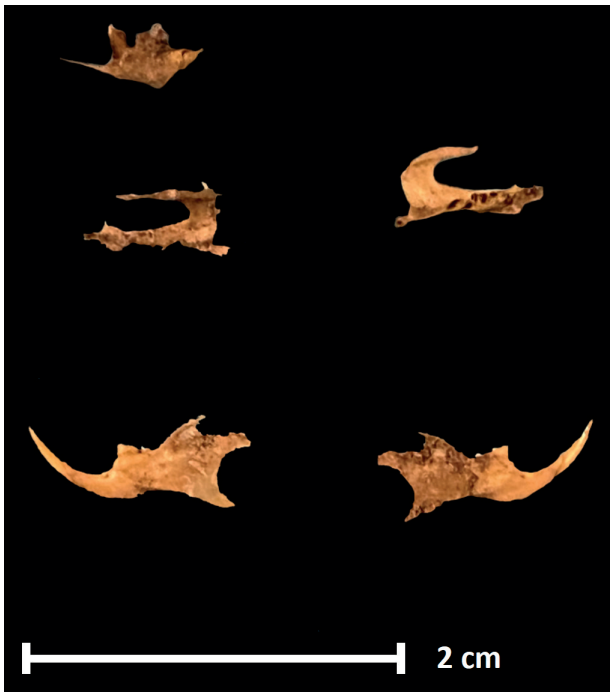

Figure 6. Two hemi-mandibles, two skull fragments and a small hemi-mandible, belonging to house mice.

Discussion

Even though rodents nesting is not frequently reported in bioanthropological literature, we believe it represents a common finding in mummified bodies. Rodent nesting inside mummies has been incidentally reported in paleopathological and forensic cases but no similar instance has been described to date in a body belonged to a Saint or a Blessed of the Catholic religion. Our present report confirms these assumptions. Rodent nests built with spun threads and fabric scraps from mummy's clothes were found inside the abdominal region of a partially skeletonized, natural mummy found in Roccapelago (Schoenholzer Nichols, 2020). A vole's nest was reported in the case study about the mummified remains of the XVII century vicar Nikolaus Rungius (c. 1560-1629). CT scanning allowed to detect some denser granular matter, mainly inside the thoracic cavity (Väre et al., 2016a). Similar structures had also been encountered inside other coffins and mummified remains (Väre et al., 2016b). Damage caused by a mouse was also noted during the conservation project of an Egyptian mummy and the related sarcophagus in the Museo Civico of Merano, Italy. The rodent damaged the mummy to build up its nest with cotton stuffing removed from a pillow and bone fragments taken from the body. The corpse of the mouse was found under the coffin (Nicola et al., 2008). A recent forensic case described red squirrels (*Sciurus vulgaris*, Linnaeus, 1758) nesting in the partially mummified body of a 35-40 years old hanged man found 13 years after death. The pelvis minor and lower part of the abdominal cavity were filled with dry yellowish-brown moss mixed with numerous small scraps of plastic film, forming the nest (Szleszkowski et al., 2018). In order to find traces of a mouse nesting within the skull of a dead man, we have to leaf through the pages of the delightful collection of anecdotes dealing with different aspects of medicine, written by Dr. Richard Francis Mould. In the "Anecdote of the Earl of Shrewsbury and a mouse" we found out that this nobleman died in 1453 and was buried at Rouen. Fifty years later his heart and his bones were moved to be buried in Whitchurch. In 1874 his tomb was restored and in the old warrior's skull the body of a mummified mouse with her three young ones was found. A truly enjoyable controversy ensued: was the mouse a French Catholic or an Anglican? The dispute ended when the Rector of St. Alkmund Church claimed to have found torn leaves of an English Prayer Book in the mouse's nest and a gnawed hole in the cloth on which the skull was wrapped. It was an Anglican mouse! (Mould, 2018)

Nesting and burrowing are spontaneous behaviors and represent daily activities. Nest building behavior is common in rodent species, as it increases lifetime reproductive success and represents an essential thermoregulatory adaption (Deacon, 2006; Jirkof, 2014). Nest material reduces heat loss and associated food consumption, as well as nests may also lower the risk of predation, by hiding or camouflaging the mouse (Deacon, 2006). Such behavior may be increased due to cold ambient temperature and complex nests could indicate cold stress (Jirkof, 2014). These pests share our need for warmth, food, and shelter, but they are unacceptable in building for many reasons such as legislation, contamination, depreciation, and reputation (Bateman, 1982). As regards dried bodies, used to form microhabitats, rodents cause physical damage because of their need to gnaw constantly to keep their front teeth worn down

and sharp, as well as chemical damage due to residue stains and surface modifications (Bateman, 1982; Cassman et al., 2007). Mice can be easily detected by their teeth marks, droppings, body hairs and smears of grease on surfaces (Bateman, 1982).

Conclusion

In conclusion, rodent activity on mummies should be carefully checked and described, in order to better understand this occurrence and to plan effective countermeasures. This important goal can be achieved only by a multidisciplinary approach, with full radiological and endoscopical investigations. Finally, it is also worth noting that contact with rodents, nests, and droppings represent a common occupational exposure for archaeologists, forensic anthropologists, and museum personnel (Cassman et al., 2007).

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Correspondence:
Luca Ventura, MD
Division of Pathology, San Salvatore Hospital, Coppito, 67100, L'Aquila, Italy –
Email: lucaventura67@gmail.com