

Relics as paleopathological evidence from the past: - tooth relics -

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Abstract

Relics represent ancient religious objects held in Churches or religious institutions for the purposes of veneration. They most often refer to the bodily remnants (mummified or not) of Saints. The importance they have retained in history is great (they were used as talismans in battles, as well to strengthen alliances or heal the sick) and still today religious people attach great importance to them. The aim of this article is to present the historical and paleopathological importance of relics, which have been poorly targeted through history. Among different types of relics the most significant tooth relics of three great religions will be presented: that of St. Apollonia, Buddha and Prophet Mohammed. Some of the most important invasive and non-invasive paleopathological studies conducted on relics (including teeth relics) are cited. The article concludes that there is a need for more research on Saints' relics, although religious constraints and other limitations are present. Results published to date have shown how targeted and well-organized research can yield important and interesting information about the life and environment of the Saint, as well attest the authenticity of the analyzed remains. The article also points out the need to establish a database of relics and how the anthropological and

paleopathological data recovered from their analysis would, while preserving their sanctity, improve our knowledge on the topic and add new osteobiographic data to the known written facts about a specific Saint.

Keywords: relic; Saint; tooth; paleopathology

Introduction

Relics represent any ancient religious object that is held in a church or religious institution for veneration purposes. Although people most often refer to them as the body parts of Saints, other material artifacts can be also counted among relics. Consequently, we can differentiate three main categories of relics: first class relics refer to body remains of Saints, most often mummified body fragments or skeletal elements as well as instruments of the Lord's Passion such as fragments of the cross, the holy nails, the crown of thorns, and the holy lance (known also under the name *Arma Christi*). Second class relics refer to items used by the Saint during his/her life, such as clothing or other everyday objects. Third class relics are items that have been in contact or touched by the Saint or a first and/or second class relic (1).

Both first and second class relics exist as objects of religious tradition and are important from an anthropological, ethnological and historical point of view. Through the analysis of remains scattered in churches across Europe, it is possible to document how the cults of Saints spread in Europe and how were the relics used by Church authorities to preserve religious consciousness among people and maintain strong its presence in different communities (2). In the beginning, for a martyr to be canonized, the "voice of people" (*vox populi*) or decision of the local bishop was sufficient. From 1215 on the designation was conducted exclusively by the Pope and in 1234 Gregory IX determined that it can be done only by the Holy See (3). Although the collecting of relics in Christianity goes back to ancient Rome and the time of the first Christian martyrs whose bones were held in catacombs, the greatest number of relics appeared during medieval times, when the "production" of relics started. At this time, the process of preservation and evisceration of some of the Saints' bodies was used also as a method for gaining organs that served as relics to be spread through European churches (4). Despite the "production" of original first class relics, an illicit trade of non-authentic relics flourished at the same time. This has resulted in a surfeit of relics today, where there are more relics of a specific Saint curated at various churches than bones in a single body (5). To guarantee the authenticity of relics, from 1543 on, every relic must have a special seal or "*autentica*" given by the highest ecclesiastical authorities (3). Relics are very important part of Christian religious and cultural tradition, but can be found also in other religions, such as Buddhism, Hinduism and Islam.

First class relics also represent an important source of information for paleopathologists, as skeletal parts can yield information about the life of the Saint and diseases that were common when they were alive. Relics are a specific category of ancient skeletal remains. Although they cannot yield important

information in the context of population studies, they can serve as evidences of the Saints life and times to which they belong.

Paleopathological studies uncover historic secrets about the living conditions in the past and help us to understand how environment and lifestyle has impacted on human health in ancient times to the present day. Today modern technologies and knowledge are more involved in the scientific studies of ancient remains and involve paleogenetic, paleohistologic and paleoimaging studies. The challenging mission of paleopathologists is to be able to interpret the remains and diagnose a disease just on the basis of limited information gained by means of one or more paleodiagnostic techniques. This applies in particular to the study of relics and Saints' mummies (remains of holy people) as it has to face extremely tight religious constraints that allow only the performance of reconnaissance surveys and studies oriented toward conservation of the relic using non-invasive methods (4). However, when performed, paleopathological studies have been found to be very important because they can be used to reveal the authenticity of a relic, as well facts about the Saint's life and pathologies that can help upgrade the existing biographic record with additional osteobiographic data (6).

Teeth as relics

Among the most important Saints' relics, different body elements are counted: they are mostly fragments or complete bones of the Saint, mummified parts of the body or inner organs (i.e. tongue, finger, heart), complete mummified bodies, as well as dried blood, hair etc. Considering the decision taken at the Second Council of Nicaea in 787 (Canon 8) that decreed that every altar should have a relic (7), it can be concluded that the number of relics scattered in churches all around the world is enormous and hard to list in one place. Just for an example, the church of St Blaise in Vodnjan, Croatia has a collection of over 290 relics of a number of early Christian martyrs (8), of which the major part of them is still unidentified, while Fulcheri claims the existence of over 409 relics in Italian churches (Fulcheri, pers.comm.). In addition, there is no complete and structured list of relics present in Europe on which to rely.

Teeth represent a common type of Saints' relics because of their durability and the ease with which they can be acquired. They may be kept as isolated specimens in adequate reliquaries or be part of the upper and/or lower jaws of a Saints' skull. Interestingly, teeth relics hold high significance in different world religions: Christianity, Islam and Buddhism. Teeth are also important in world symbolisms where they are regarded as carriers of vitality, reproduction and power (i.e. among African Christians it is believed that a seven-year old child's tooth, set in gold or silver, can impede conception and if the first tooth of a baby falls without touching the ground it will prevent pain in genitals) (9). Still today, the reasons for that symbolic connotation are not clearly elucidated.

Christian tooth relic

In Christianity the best known tooth relic is surely that of St. Apollonia, who is commonly regarded as the Patroness of dentistry and people suffering from dental diseases and related problems. She earned this role on the basis of the tortures she suffered during her martyrdom. According to the legend describing her life and deeds, she was killed by the Romans after a torture that included heavy blows to her head and face and a painful and violent extraction of her teeth with pincers (10). It is not strange thus that the most common relic attributed to St. Apollonia is a tooth. In 1987 Wiliam S Walsh tried to classify the relics attributed to St. Apollonia and came out with ten churches that curate the relics of St. Apollonia (11), while Skrobonja *et al.* cite the presence of 15 relics in Europe and the USA as well as several questionable body parts of the Saint (12). These are mostly parts of the skull, arms and teeth. St. Apollonia teeth can be found in the cathedral treasury in Rab, Croatia (first upper right premolar), in the cathedral in Porto, Portugal (lower molar) (12), and small fragments of teeth held in the Victoria and Albert Museum and in the Anglican Shrine, at Walshingam in Britain (13). There are also data claiming that Philip II of Spain collected as many as 290 holy teeth from St. Apollonia, confirming not only the importance attributed to the Saint (14), but also the above-mentioned hyper-production of Saints' relics in the Middle Ages.

Except for Churches, relics can be found also in Museums where they came mostly as donations. Indeed, another two important tooth relics - that of St. Mary Magdalene and St. John the Baptist, are located in two museums: the Metropolitan Museum of Art in New York and the Art Institute of Chicago (15, 16). Here, another important fact about the relics arises - the problem of homonymy. When citing a relic of a specific Saint, it must be taken in consideration that there is a great number of Saints and often they share the same name. For example, when the relics of St. Marcian have been found in the city of Rijeka, one of the tasks of the specialists involved in its study was to determine to which St. Marcian the relic belongs to, because in Roman martyrology 15 different saints named Marcian are cited (6). The same is true with the teeth of St. Mary Magdalene. Although the tooth can be attributed to Mary Magdalene, one of the most devoted disciples of Jesus, there is another important St. Mary Magdalene in the Christian tradition. It is St. Mary Magdalene De' Pazzi, Patroness of people suffering from cough and scurvy, whose hagiography reveals how she died of scurvy and suffered the loss of all her teeth (12).

Besides the tooth relics of the three cited Saints, there are probably many more tooth relics (either isolated or as part of the skull) scattered all around Europe. It would be very interesting to create a database of relics present in Churches and museums across the world which would allow and facilitate historical, anthropological and biological studies on them.

Buddhist tooth relic

Along with St. Apollonia's tooth, one of the most important tooth relics is the tooth of Siddhartha Gautama - Buddha. Its importance is evidenced by it being the only body part of the spiritual teacher to be preserved after his cremation. Although the earliest Buddhist tradition does not mention the existence of the tooth, the later legends state that the tooth was removed from the pyre before the ashes of the Buddha had been divided among eight rival claimants. Today, it is retained in the Temple of the Tooth in the city of Kandy, Sri Lanka (17). However, as it often happens with relics, other institutions claim to have the tooth of the Buddha: Lingguang Temple, China; Buddha Memorial Hall, Taiwan; Shari-den, Japan; Buddha Tooth Relic Temple and Museum, Singapore (18).

Islamic tooth relic

Although Islam does not venerate relics, some Muslim sects revere the remains of important personalities of their religion, such as the Prophet Muhammad. Among the relics, personal items of the Prophet, like the mantle, a battle standard, sacred seal are found as well as body remnants - the beard and a tooth. Today they are held at the Topkapi Palace in Istanbul. The tooth is believed to be one of the four teeth lost by the Prophet Muhammad during the Battle of Uhud (19).

Paleopathological studies on relics

As said before, although paleopathological studies could help to reconstruct better the life of the specific Saint and thus be very important from a historic, medical, anthropological and religious point of view, there are difficulties in performing scientific research on relics, primarily due to religious constraints. For this reason, the international literature lacks of such studies and paleopathological analysis on relics appear only occasionally when accessing and searching scientific databases (i.e. Pubmed, Science Direct).

The majority of the published studies on relics are based just on a morphological and macroscopic analysis of the 'holy' body remnants. The reason of such an approach is the impossibility to extract the relic from the sealed reliquary and, in case of complete mummified or skeletonized bodies, the desire to preserve the integrity of corpses that are, still, very important for the pious community. Fulcheri evidenced the need to "establish a model for multidisciplinary approach to paleopathological research, integrating historical research and medical knowledge" in the study of Saints relics and mummies (20). Indeed, the majority of scientific studies on Saints' relics are made on mummified body parts or whole bodies. Some of the research conducted on Saints relics and corpses included the exhumation and

analysis of the natural mummies of St. Caterina Fieschi Adorno and Beata (Blessed) Margherita di Savoia (radiological and macroscopic examination) (20), St. Rosa of Viterbo (radiological exam) (21), Saint Zita from Luca (histological, edoscopic, paleonutrition and spectroscopy studies) (22,23), St. Giacomo (anthropological and CT analysis) (24), Beata Cristina and Marina from Spoleto (autopsy findings) (25), Beata Elena Guerra (anthropological, radiological and histological examination) (26), of the putative skull remains of St. Birgitta (anthropological and DNA analysis) (27), skull of St. Albert of Louvain (anthropological) (28), mummified heart of St. Rosa (anthroposcopy and radiological examination) (29) and remains of St. Marcianus (microbiological studies) (30). The works most often discuss the methods used in mummification of the corpses, or are attesting the stage of preservation of soft tissue and diagnose diseases and/or trauma that link to the known biographical facts of the Saint.

Only one work discusses a tooth relic from a biomedical point of view - that of St. Apollonia held at the cathedral treasury in Rab, Croatia. Here, Skrobonja *et al.* macroscopically examined the tooth in situ and on enlarged high-resolution photos (12). The results evidenced a type II enamel lesion (cervical or gingival caries) and the presence of enamel fractures and two enamel pearls on the distal surface of the tooth root. Neither further analysis of the tooth, nor scientific dating of the relic followed.

More interesting information about a Saints' tooth was revealed by a study which wanted to test the authenticity of the remains of St. Luke in Padua. Here, two teeth (an entire canine and a canine root) were subjected to DNA analysis and carbon-dating (the carbon dating was performed on a part of a femur). These revealed that the remains belonged to a person of Syrian ancestry living between 73 and 430 AD (31). These data were important because they yielded new information about the corpse attributed to St. Luke, confirming that the body comes from Syria and may really belong to St. Luke.

Another problem for the analysis of the relics is that often they are not available neither for a simple macroscopic examination, as they are often showed to the devotees from a great distance and/or only on special occasions. This is happening to the tooth relic of the Buddha. There exist just a limited number of the tooth's descriptions, and it is also possible that the tooth is a replica. A Portuguese historian of the 16th century, Diego de Couto, described it as a tooth mounted in gold, "which was generally said to be the tooth of an ape, but which was idolatized as the most sacred of all objects of adoration..." (32). On the other hand, an English physician, John Davy, in 1821 described the relic in more detailed and offered a sketch of the item. According to Davy the tooth was enclosed in 5 gold caskets and it was "of a dirty yellow color except towards its truncated base, where it was brownish". The Englishman had some doubt about the authenticity of the tooth: "Judging from its appearance at the distance of two or three feet... it was artificial and of ivory, discolored by age."(33).

Conclusion

In conclusion, this short review on such an interesting topic as bodily remains of holy people has showed that there is still lack of broad biomedical and interdisciplinary studies on relics, supporting the necessity to increase their number in order to form an expert and detailed database of relics and their characteristics. The studies conducted to date offer stimulating results that show how there is still much to say about Saints' pathological and anthropological conditions. The scientific study of Saints' relics, although today still limited to the occasions when the recognition or the authentication of the remains is requested, will surely add knowledge about their life, environment and death. The osteological, anthropological and paleopathological results will be able to confirm and enrich the known biographic data, as well put some questions about the authenticity of both the remains and the available written data. All these must be done in an interdisciplinary and non-invasive way in order to protect the role that these bodily remnants retain among religious people. Among the study of different relics, the study of tooth-relics and the use of teeth in reconstructing the biological profile of relic skulls and jaws is surely one of the most important, as demonstrated by the study of St. Luke remains.

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