Case report: paleopathology

A retrospective study on the artificial mummification of the Blessed Andrea da Montereale (AD 1479)

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Abstract. Andrea da Montereale was a 15th Century Augustinian monk from the inner Abruzzo region, central Italy. We investigated the preservation mechanisms of his body by retrospective survey of textual sources and reports from the Canonical Recognitions. The partially mummified body of the Blessed Andrea da Montereale revealed indisputable evidence of artificial mummification (excerebration and evisceration cuts, absence of internal organs) at visual inspection. The cadaver features emphasized by the hagiographers (vivid colours, absence of putrefaction or bad smelling for thirty days after death, without balsams treatments) sounds like an unrequested explanation for the body miraculous preservation. To the best of our knowledge, this represents the twelfth known case of an embalmed body in Catholic Religion, the tenth in Central Italy, and the second one documented in the Abruzzo region.

Key words: Mummies, embalming techniques, Saints, Blessed, central Italy

Introduction

The mummies of Catholic Saints and Blessed represent a special category of human remains, almost exclusively kept in Italy (1). Relics in the Church have always received veneration as they have been considered "*the living temple of the Holy Spirit on Earth and the instrument of holiness recognized by the Apostolic See, through beatification and canonization*" (2). Thus, a special care and attention were reserved for these remains in order to assure their preservation and veneration, and to avoid abuses. Specific procedures, known as Canonical Recognitions, are carried out to verify the authenticity of relics, to guarantee their preservation, and to promote their veneration (2, 3). Scientific investigations on these mummies are of particular interest from the anthropological, paleopathological, and biological viewpoint, as well as from an historical, cultural, religious, literary, and artistic perspective (4).

In past times, natural mummification was considered a prodigious sign of incorruptibility and used to be called for during Canonization trials, but artificial preservation of the bodies was not infrequently performed (1, 5, 6). Especially in the Middle Ages, the bodies of Saints were sometimes artificially mummified in order to preserve them, as veneration and cult had often started when they were still alive (6). By this way, the corpse might be exhibited for long periods of time after death without damaging it (1).

Andrea da Montereale was an Augustinian monk, born between 1402 and 1404 in the village of Mascioni (L'Aquila, central Italy), and died in the nearby town of Montereale in 1479 (7-11). According to hagiographies, his corpse was displayed in the conventual church for thirty days without balsams, giving off sweet odor and performing miracles (12-14). He was beatified in 1764, and his body was officially inspected four times since 1786.

Aim of the present study is to investigate the mechanisms involved in the preservation of Andrea's body by a retrospective survey of textual sources and reports from the Canonical Recognitions.

Methods

Textual sources were examined to highlight significant data, in order to identify pathologic processes and body preservation mechanisms. The account of life and miracles by Andrea da Montereale appears in three main historical texts, edited by subsequent non-contemporary authors, namely Sante Riccitelli in 1580 (12), Luigi Torelli in 1647 (13), and Giovanbattista Cotta in 1726 (14). The *Vita* drafted in Italian by Riccitelli was also published in Latin by the Bollandists and included in the *Acta Sanctorum* (15). Additional information about the history of the body after death were taken from modern publications (7-11).

Documented Canonical Recognitions of Andrea's earthly remains took place in August 1786, in July 1943, and in June 1961, being promoted by the Bishopry of Rieti (Lazio region), which Montereale belonged to until 1975. A most recent one was ordered by the Archbishop of L'Aquila (Abruzzo region) in order to evaluate the conditions of the Holy Body. It was performed from June to July 1989, by one of us (M. R.) and the late professor Giulio Marinozzi. The mummy underwent visual inspection followed by restoration and conservation treatments. Unfortunately, radiologic investigations and laboratory analyses could not be performed at that time.

Anthropomorphic traits and craniofacial indices were scored where possible, and measurements were calculated according to international standards (16). Height was calculated according to the regression proposed by Trotter and Gleser taking into account the combined measurements of the femur and tibia (17). Sex was verified using indicators of the ossa coxae (18), cranium and mandible (19). Age-at-death was estimated thanks to degenerative indices and morphological variants of the skeleton (20) and dental wear pattern (21). Ergonomic indicators and the study of occupational markers have been analyzed following Capasso et al. (22) and Mariotti et al. (23).

Results

According to tradition, Andrea was born in 1397 to a humble family in the village of Mascioni (Abruzzo region, central Italy) (10-14). More likely, his birth should be placed between 1402 and 1404 (7-9). He entered the ranks of the Augustinian convent in the nearby town of Montereale, to be ordained as a priest at the age of 25 (10). He earned a bachelor and master's degree in Theology in Siena, where he became professor in 1443. He also served as a travelling preacher in Italy and in France, reforming several Augustinian monasteries. In 1476, he retired in Montereale to stay until his death, occurred on 18 April 1479. Since then, his body has been preserved in the local conventual church. In 1691, a major earthquake struck the area, but Montereale was kept safe by Andrea's intercession (14). His protection failed during a more powerful earthquake in 1703, but his altar was found intact within the destroyed church (14) (Fig. 1).

Figure 1. The Blessed Andrea da Montereale, by Carlo Magini (1720-1806) in the church of S. Agostino in Pesaro (Marche region, central Italy). The collapsing buildings in the background represent his attribute as a patron saint against earthquakes. The book is the symbol identifying the theologist.

The main hagiographers agreed that his body was exposed without balsams in the conventual church for thirty days, giving off sweet odor and performing miracles (12-15). About a century later, Sante Riccitelli (12) wrote:

Fu il suo beato corpo tenuto trenta giorni nella nostra Chiesa senza odori, o balsamo: e non solo odorava e si manteneva bello et intiero; ma anche faceva infiniti miracoli, come anche tuttavia ne fa.

His blessed body was kept odorless and without balsams in our Church for thirty days: not only smelling and keeping fine and intact; but making several miracles, as it makes them yet.

In 1647, Luigi Torelli reaffirmed (13):

(…) e si sentì un'odore così soave, che ben si conosceva essere di Paradiso; fù tenuto il suo Corpo insepolto per lo spatio di 3o. giorni; nel qual tempo, non solamente si mantenne sempre incorrotto, e bello (come pur hoggi giorno tuttavia si mantiene, come se morto fosse da hieri in quà) e si sentì il sovradetto odore, ma di vantaggio fece nell'istesso tempo 27. gloriosi miracoli (…)

(…) and there was such a sweet odor, well known to from Paradise; his Body was kept unburied for 30 days; during that time-lapse, it not only remained intact, and fine (as today also keeps, as he would have been dead yesterday) and we felt the above-mentioned odor, but he also made 27 miracles (…)

Years later, the Bollandists (15) quoted Riccitelli, reiterating that the body was exposed in the church to public veneration for thirty days without balsams; nevertheless, it had sweet odor and vivid color:

Corpus defuncti per triginta dies expositum venerationi publicae in templo stetit, nullo conditum balsamo: & tamen odore sano ac colore vivido, ciebat non tantum admitationem accurentium, sed etiam miraculis coruscabat.

Moreover, they pointed out that the time-lapse was thirty days and not three as previously stated by Cornelius Dielman from Gand. This issue was later confirmed by Giovambattista Cotta (14):

(…) fu necessità di differire la sepoltura (…) per lo spazio di trenta giorni continovi, e non di tre secondo che scrisse Cornelio Dielman Gandavense (…)

(…) e si vede ancor in oggi interissimo, e bianco senza ombra di corruzione, e di quell mal'odore, che sfiata dal fango della nostra misera umanità.

Erasi ricolorita di vive tinte la carne sua (…)

(…) burial had to be delayed (…) for thirty consecutive days, not three as written by Cornelius Dielman from Gand (…)

(…) today it may be observed intact, and pale with no trace of corruption, and bad smell, discharging from the mud of our miserable human nature.

His flesh had regained vivid colors (…)

Subsequently, the body was placed in the choir until 1568, when it was relocated beneath the main altar to be displayed (11). The beatification was celebrated by Pope Clement XIII on 18 February 1764. In 1787 his body was translated into a repository built inside a new chapel dedicated to him. After the Recognition performed on July 15th 1943, the medical consultants Angelo Ricci and Andrea Nanni briefly noted that the body was well-preserved in the head, hands, and feet, covered by mummified skin, but legs and thorax were not. The length of the Blessed's body was 1.64 meters:

Id repertum est bene servatum in capite, manibus et pedibus pelle coriacea contectis, necnon in cruribus et in pectore. Beati Corpus in longitudinem patet vulgo m. 1,64.

The intervention made on June 16th, 1961, entailed a simple external inspection (personal communication by Mr. Donato De Santis). No related document has been found to date.

During the last Canonical Recognition, the body was found dressed in a modern Augustinian tunic and sandals. The head, hands and feet were the only visible parts. The hands, crossed upon the abdomen, were well-preserved (Fig. 2), as well as the feet (Fig. 3) and the face. After removing the modern garments covering the body, external inspection revealed a partially skeletonized mummy in a good state of preservation. The mummy belonged to an old male subject (more than 70 years of age at death), the face was almost

Figure 2. The dorsal aspect of the hands.

Figure 3.The anterior aspect of legs and feet.

entirely covered by mummified skin, with traces of hair in the perioral region, chin, and cheeks, according to devotional representations of the Blessed as a bearded elder subject. Soft tissues of forearms, hands, legs, and feet also appeared in a good preservation state.

The anthropological evaluation was severely limited by the presence of large portions of mummified tissue and joint structures. The lack of some bone elements hindered a complete analysis. The nasal index (NI), which turns out to be camerrhine, was 55.17 (wide and low nose). The upper face height (UFH) index was found to be hyper-lepto, 61.40 (elongated face), with a rather broad mandible (94.73). The estimated height, calculated on the combined measurements of the femur and tibia, was 172.02 cm. In general, a long-limbed and fairly high appearance is therefore sustainable, if related to the averages of the time. The partial observations carried out on the cranial sutures and on the dental attrition indicate a certainly senile age at death. The study of ergonomic indicators and occupational markers, also strongly limited by the presence of soft tissues, suggested a mild muscular effort. Weight bearing activities do not seem to have affected the life of the Blessed. In fact, the vertebral bodies did not present crushing or load injury, and the anatomical curves appear rather preserved, whereas intense inflammatory processes were evident in the thoracic-lumbar tract, characterized by evident marginal lipping and osteophytic processes. The severe thinning of the intervertebral disc at L4-S1 level was also noticeable. All these aspects, together with widespread osteoporosis of the vertebral bodies, lead us to infer an osteoarthritic condition, typical of the senile people. Furthermore, the intense stress of the lumbar spine, which does not seem to be compared with the gleno-humeral and coxo-femoral joints, spared from inflammatory processes and functional overload, could be traced back to forced and sustained postures for a long time (24), such as sitting in benches bent over books and documents. The upper jaws presented a diffuse *intra-vitam* loss of many elements, with evident alveolar reabsorption. The mandible had more teeth preserved and characterized by intense widespread wear. The upper gingival border was well defined by the presence of dental calculus on the right.

A large defect measuring 10 cm in largest diameter was observed in the occipital bone (Fig. 4). Large skin defects were found in the anterior neck and the right hemithorax, along with a bone cut mark on the right margin of the sternum (Fig. 5). The ventral portions of the left inferior ribs appeared cut and

Figure 4. The head of the Blessed with the occipital bone defect (dotted line).

Figure 5. Frontal aspect of the head, neck, and upper thorax, showing a large skin defect in the anterior cervical region (red dotted line), and a cut of the right sternal margin (orange dotted lines). Metal wires in the center were probably added in recent times to shape the body surface.

displaced in the thoracic cavity. Cut marks were also found on the anterior branches of the pelvis (Fig. 6). Neither encephalic remnants nor traces of internal organs were found within thorax, abdomen, and pelvis. No defleshing incisions were noted in the visible cutaneous surface. Unfortunately, a radiologic investigation of the body was not performed, and no tissue samples could be obtained to be submitted to laboratory investigation.

Discussion

In past times, the lack of the natural corpse decay was considered a prodigious sign. From the late Middle Ages to the 19th century, the incorruptibility of the body used to be an essential requirement for the recognition of sanctity during Canonization trials. However, the body underwent at times funerary embalming to be preserved for veneration and/or long-time exhibition after death (4). Historical sources and hagiographies rarely mention the artificial conservation of the body in such instances (25, 26). At least eleven cases of artificially mummified Holy Bodies, dating back from

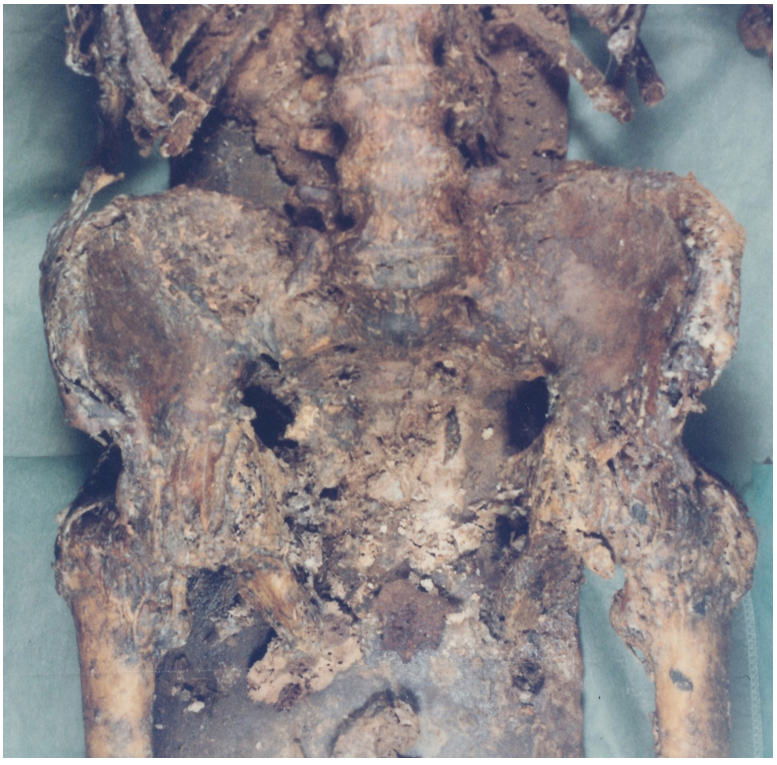

Figure 6. Frontal aspect of the hip bone lacking its anterior components.

1297 to 1482, have been documented in the literature (Table 1). These examples are extremely relevant and demonstrate that the treatment of bodies was a fairly common practice in the Middle Ages (1, 3-5, 25-28). Artificial mummies of Saints and Blessed represent the most ancient examples of body embalming in Europe. Ten of these artificial mummies were created in central Italy (Umbria, Toscana, Abruzzo, Lazio) between 13th and 15th century. Beside artificial mummification practice, the preservation mechanism might also be eased by the application of chemical substances to the skin surface. This so-called spontaneous-enhanced mummification (29) was based exclusively on external treatment without evisceration, as recently described for the Blessed Jean Bassand (30, 31). Ideally, even in the absence of the typical signs of evisceration (e. g. cuts, sutures), the mummy's skin should always be analysed in order to rule out the presence of dehydrating or embalming substances, and to define as natural the preservation mechanism. Additional cases of ascertained embalming were described in religious figures who died in post-medieval times. Saint Francesco Caracciolo (1563-1608) died in Agnone, central Italy, on June 4th 1608, and his body was embalmed in order to be transported to Naples (32). The body of Saint Gregorio Barbarigo (1625-1697), born to a noble Venetian family and appointed Bishop of Padua in 1664, was embalmed by the surgeon Antonio Masieri by using a considerable number of powdered drugs and herbs (33).

According to hagiographic sources, the corpse of Andrea was not affected by putrefaction or bad smelling thirty days after death. Obviously, this chance is impossible in untreated bodies, and even more so in the springtime. Also, the "vivid colors of the cadaver" quoted by Riccitelli, by the Bollandists, and by Cotta (12, 14, 15), as well as the preservation without balsams emphasized by all the hagiographers, sounds like an unrequested explanation for the body miraculous preservation.

Moreover, the body of the Blessed Andrea da Montereale revealed indisputable evidence of artificial mummification (excerebration and evisceration cuts, absence of internal organs) at visual inspection. Although no further analyses could be performed to detect the substances used for embalming, we believe he represents the twelfth known case of an embalmed Holy Body in Catholic Religion and the tenth in Central Italy.

With regards to the geographical viewpoint, it is worth recalling that Montereale is located not far from L'Aquila (1 embalmed Saint) and on the main route towards Cascia (1 embalmed Saint) and Spoleto (2 embalmed Blessed). This path signed the main trade route from Florence to Naples, the most important Italian capitals in 15th Century. The embalming of the Blessed Andrea took place only 35 years after the death and embalming of Saint Bernardino da Siena in Aquila (today L'Aquila) and represents the second case in Abruzzo region. The only Saint embalmed in Abruzzo region is Bernardino da Siena (1380-1444) who represents the most important figure of the Franciscan Observance movement (34). He died in Aquila, most likely from tuberculosis. His body was embalmed to be displayed inside a newly built basilica, and the knife used to incise the corpse is still preserved (1, 5). The artificial mummy underwent at least four recognitions, but no scientific detail is available about his diseases and the embalming technique adopted (28).

Most of these embalmed Saints or Blessed were produced in special socio-political contexts. In fact, this phenomenon is considered purely urban, and concerning peculiar social and religious environment, with a prevalent female extent (1, 25). To date, the female prevalence cannot be credited anymore because recent reports allow to change the actual M:F ratio to 5:7. Table 1 also shows the distribution according to Religious Orders, with five cases belonging to the Franciscan Order and the same number to the Augustinians, whereas two figures were Dominican nuns. The bodies belong to Saints in seven cases and to Blessed in five.

Belonging to people already considered as Saints during life, these bodies were intentionally preserved to proof the divine protection of the community through their imperishability. They could also be used as a source of revenue, as well as to gain political or religious autonomy. It is not a case that the practice arose in a well-defined area of central Italy, where civic independence was strongly perceived (25). The endorsement of body embalming by municipal authority is historically documented in Margherita da Cortona (1297), Ranieri da Borgo (1304), Margherita da Città di Castello (1320), and Cristina da Spoleto (1458) (3, 4, 25, 26).

The artificially mummified bodies of Saints and Blessed allow to investigate the embalming techniques

Table 1 – Artificial mummies of Saints and Blessed. Chronological order by year of death.

Name	Gender	Order	Dates	Place	Region
S. Margherita da Cortona	F	Franciscan	1247-1297	Cortona	Toscana
B. Marina da Spoleto	F	Augustinian	1250-1301	Spoleto	Umbria
B. Ranieri da Borgo	M	Franciscan	? – 1304	Sansepolcro	Toscana
S. Chiara da Montefalco	F	Augustinian	1268-1308	Montefalco	Umbria
S. Margherita da Città di Castello	F	Dominican	1287-1320	Città di Castello	Umbria
S. Caterina da Siena	F	Dominican	1347-1380	Roma	Lazio
S. Bernardino da Siena	M	Franciscan	1380-1444	Aquila	Abruzzo
S. Rita da Cascia	F	Augustinian	1381-1457	Cascia	Umbria
B. Cristina da Spoleto	F	Augustinian	1435-1458	Spoleto	Umbria
S. Giacomo della Marca	M	Franciscan	1393-1476	Napoli*	Campania
B. Andrea da Montereale	M	Augustinian	1402/4-1479	Montereale	Abruzzo
B. Pacifico Ramati	M	Franciscan	1426?-1482	Sassari**	Sardegna

M: male, F: female;
* now in Monteprandone (Ascoli Piceno, Marche region);
** now in the Parish Church of Cerano (Novara, Piemonte region).

employed in the late Medieval and Renaissance ages (1). They display a variety of methods, generally more complex than those applied to laymen's cadavers (35). The body cavities were usually exposed to be eviscerated through a jugulo-pubic, a xipho-pubic, or other longitudinal incisions of different length. The incision of a main body cavity was described or inferred in Margherita da Cortona, Chiara da Montefalco, Margherita da Città di Castello, Rita da Cascia, Cristina da Spoleto, and Giacomo della Marca (3-5, 25, 27). Posterior craniotomy was also carried out in order to obtain excerebration, as documented in Cristina da Spoleto and Giacomo della Marca (25, 27). In subjects affected by severe obesity, additional cuts were performed in upper and lower limbs in order to remove fat tissue (defleshing incisions). Sutured defleshing incisions were clearly demonstrated in Margherita da Cortona, and Cristina da Spoleto (3, 25).

The body of Andrea da Montereale showed sufficient evidence of artificial mummification by evisceration, as demonstrated by the presence of a transverse cut at the neck base and a jugulo-epigastric incision. Although the skin in the epigastric region was not preserved, we argue that pelvic evisceration was made by cutting the anterior branches of the pelvic bones. The absence of internal organs in the main body cavities (thorax, abdomen, pelvis) confirmed the hypothesis of artificial mummification by evisceration. The wedge-shaped opening of the occipital bone represents a clear sign of posterior craniotomy, through which an excerebration was performed. The evisceration procedures employed in the present case appear somewhat rough, without the complexity usually observed in other examples. Unfortunately, no conclusion can be drawn about the substances employed for chemical treatment of the body, as no tissue sample was available to be submitted to laboratory analysis.

After the recent earthquake occurred in 2017, the mummy of the Blessed Andrea has been secured inside the conventual church in Montereale, where it is currently kept. Whereas the post-seismic restoration of the building is still expected, a new Canonical Recognition was strongly advised, and we heartily recommended the competent authorities to install equipment for monitoring temperature and relative humidity.

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