

# Investigations the Cutaneous Damage of Ancient Natural Mummies. The Case of the Venzone Collection

G. Baggieri

Soprintendenza al Museo Preistorico ed Etnografico "Luigi Pigorini", Roma - Italy

*Received: June, 2010.*

*Key words: Mummy; Laceration; Cutis; Venzone;*

---

## Summary

We observed the seriousness of the lacerations on the cutis of the mummified bodies of the Collection of the Cathedral of Venzone (northern Italy) due to the necessity of the restoration interventions which ended in 2009.

The mummies of Venzone are known worldwide and are considered as an example of natural mummification.

---

## Riassunto

Abbiamo osservato la gravità delle lacerazioni sulla cute dei corpi mummificati appartenenti alla Collezione della cattedrale di Venzone (nel nord d'Italia) a causa della necessità di interventi di restauro finiti nell'anno 2009.

Le mummie di Venzone sono conosciute in tutto il mondo e sono considerate un esempio rilevante di mummificazione naturale. Abbiamo anche valutato aspetti di struttura al microscopio elettronico a scansione.

## INTRODUCTION

The Mummy Collection of Venzone is composed of 15 mummies (8 males, 6 females and 1 corpse of uncertain sex). Five of the fifteen mummies are now displayed inside the crypt of the chapel of Saint Michael, near the Cathedral of Venzone. The average age at death is about 70 years. Almost all of these corpses date back to the XVII-XVIII and XIX centuries, except for one mummy that dates back to the XIII century (4-7).

As a whole, this Collection was in very bad condition up until 2009. In fact, all the interventions made in the preceding years had been confined to consolidation, assemblage and cleaning of the deteriorated anatomical parts of the bodies, following the earthquake of 1976. All these operations, even if imperfectly performed, were indispensable to ensure the integrity of the bodies. Only in 2008 we were able to introduce the necessary restoration plan inside the study pro-

gram which was started in 2003. Moreover, we carried out the radiological exams on all of the mummies which allowed us to see the internal organs in the abdomen, thorax and skull (7-10). From a preservative point of view, the mummies which underwent a natural mummification present more problems during the process of restoration than the embalmed corpses. In particular, we found difficulty in choosing the most appropriate conservative preparations to use for repairing the corpses, especially because we did not know the final result (14).

Regarding the internal structures, it was sufficient to carry out disinfestation, while we paid particular attention to the choice of the cutaneous preservative treatments and to the selection of the consolidators to use on the cutis. We performed some skin repairs in order to close all the lacerations and holes provoked by infestations and humidity, and that had seriously damaged large portions of cutaneous tissue in all of the fifteen mummies (Fig. 1).



*Fig. 1 Example of laceration.*

The weight of a mummy is approximately 5-10% of the weight of the corpse at the moment of death, while the form of a mummy depends on its antiquity, on the lying position, on the sepulchre, on the climate changes at the moment of death (12; 3) and on the possible use of post-mortem treatments (i.e. tying, sudaria, dresses, unguents, bandages, etc... (12; 10).

The surfaces of the skin appear to be coriaceous, their color having changed as a consequence of the lying position of the single mummy and depending on the sepulchre. In general, the cutis is quite wrinkled to the touch, in every anatomical district. We did not observe any smooth surface, as we might have found after a treatment of the skin with resins, balsams, waxes, or ointments (1; 13; 16).

The wider lesions and lacerations were located

at the level of the basins and of the anterior side of the thighs. The lower limbs of some mummies presented large areas of lacerations with marked muscular disintegration (Fig. 2). A loss of cutaneous tissue was present on the surface of calvarium and on the back of some of the mummies. Regarding the lesions, they are present on all of the mummy surfaces, both on the anterior and posterior side of the bodies. We placed their frequency and importance inside a score which goes from 0 to 3. The 27% of the lacerations have a score from 0 to 1 (lesions from 5 to 10 cm.); 36% of the lesions have a score from 1 to 2 (lesions from 10 to 15 cm.), and 37% of the lesions have a score from 2 to 3 (lesions larger than 15 cm.). Moreover, 50 % of the lacerations was concentrated at the level of the lower limbs.



*Fig. 2 Example of jagged margins in a lacerations of the limb.*

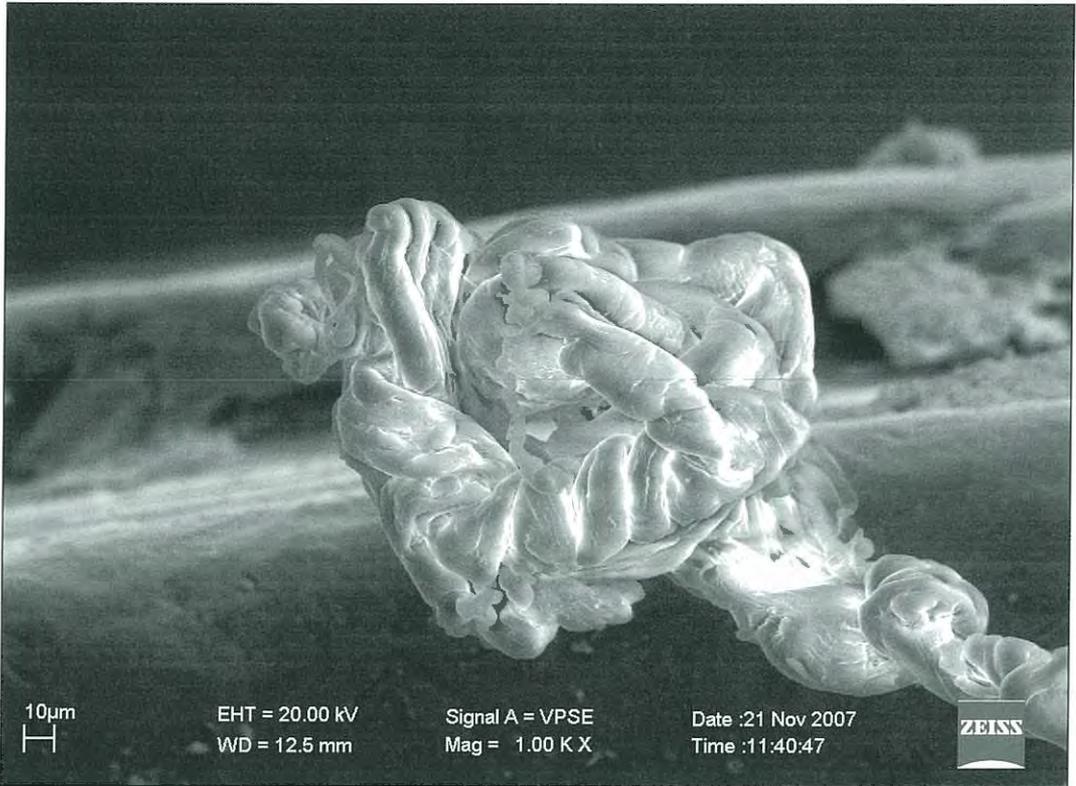
During the first phase of the process of natural mummification there is a sudden dehydration of the corpse; ventilation reduces the decomposition processes which, as a rule, begin with the cellular autolysis (12; 10). Generally this phase happens in the first days after death, reducing the degenerative phenomena of liver, kidneys, glands, bone marrow, and blood which get destroyed both inside the parenchyma and the vascular-nervous structure (9). The muscular disruption need a longer period of time; sometimes the heart and part of the arteries continue to be visible for a long period of time following death (17), probably due to a process of sclerotization. During the decomposition process, there is also the autolysis of the adipose tissue. As we have already observed, we have to keep in mind that climatic conditions and changes can deeply

interfere with the degeneration of tissues, modifying both cutaneous and muscular structures. In fact, in the course of years and centuries sudden environmental variations (i.e. humidity and/or temperature) may have provoked small or large lacerations on the cutis, or fray of muscular fibers. Circular and oval lesions have a different genesis, in fact they are provoked by microorganisms, such as parasites, insects, and fungi (10-11; 16) (Fig. 3, 4).

Lacerations are due to climate changes. In fact, the skin absorbs little water particles which evaporate at elevate temperature provoking skin surface tension, and forming fissures with definite margins on the skin, or fissure with jagged edges. It is possible to confuse the fissure that has definite margins with intentional incisions.



*Fig. 3 Definite lesions on the cutis of the arm.*



*Fig. 4* Rolled up structure of mycelium (SEM 1.000X).

## CONCLUSION

We observed a multitude of fissures with definite margins on the upper and lower limbs, and on the neck, while the lacerations on the abdomen and thorax have jagged edges. Therefore, it is possible to locate fissures with definite margins in all of the areas where the muscular fibers contract a relationship with bones, independently from the distensibility, wrinkles and rugae of the cutis.

## References

- 1) **Ascenzi A, Bianco P, Nicoletti R, Ceccarini G, Fornaseri M, Graziani G, Giuliani MR, Rosicarello R, Ciuffarella L, Granger-Taylor H. (1996)** The Roman Mummy of Grottarossa, in "Human Mummies: Global Survey of their Status and the Techniques of Conservation", vol. 3. The Man in the Ice, ed. K. Splinder, H. Wilfing, E. Rastbichler-Zissering, D. zur Nedden, H. Nothdurfer, Springer Verlag, Vienna, pp. 204-217.
- 2) **AA.VV. (2001)** Mummy Results of Interdisciplinary Examination of the Egyptian Mummy of Aset-iri-khet-es from the Archaeological Museum in Cracow, Polish Academy of Arts and Sciences, Cracovia.
- 3) **Aufferheide AC. (2003)** The Mummies of Venzone, Morphology, Radiology and Cat scan, G. Baggieri, M. Di Giacomo, *Bollettino Ass. Amici di Venzone*, Vol. XXXIII: 8-11, Venzone.
- 4) **Baggieri G, Dipilato S, Dragoni E, Di Giacomo M. (2001)** Paleo-imaging of the Mummy A4, the Infant Mummy, and Other Bodies From The Basilica of St. Francesco in Arezzo, *Paleopathology Newsletter*, 113: - 8-12.
- 5) **Baggieri G, Piazza P, Bertossi R. (2001)** The Mummies of Venzone, *Paleopathology Newsletter*, 114: 6-8.
- 6) **Baggieri G. (2002)** Le mummie di Venzone: aspetti di mummiologia generale e degrado post-mortem, *Bollettino Ass. Amici di Venzone*, Vol. XXXI, Venzone.
- 7) **Baggieri G, Di Giacomo M. (2003)** Le mummie di Venzone morfologia radiologia e tac-The Mummies of Venzone, Morphology, Radiology and Cat scan, *Bollettino Ass. Amici di Venzone*, Vol. XXXIII, Venzone.
- 8) **Baggieri G. (2007)** The Mummy Colletion of Venzone (UD. Italy): Evaluation of the Neurocranial Remains of the Meningeal Membranes, Cerebral Matter and Spinal Cord, in "Mummies and Science", *World Mummies Research VI World Congress on Mummy Studies*, Lanzarote, pp. 319-323.
- 9) **Baggieri G. (2009)** Mummie e corpi imbalsamati, in F. Mallegni, B. Lippi "Non omnis moriar", CISU, Roma, pp. 355-380.
- 10) **Baggieri G. (2009)** Early Histomorphological Results of some Biopsies on the Venzone Mummies, *I<sup>a</sup> Bolzano Mummy Congress Proceedings*, Mummies and Life Science, March, pp. 19-21.
- 11) **Ciferri R. (1959)** Introduzione alla Micologia Medica, Renzo Cortina, Pavia.
- 12) **Cockburn A. et all (1998)** Mummies, Disease & Ancient Cultures, ed. Cambridge.
- 13) **Elliot Smith G. (1912)** The Royal Mummies, in «Catalogue général des antiquités égyptiennes du Musée du Caire», Imprimerie de L'Institut francais, d'archeologie orientale, Le Caire, Nos. 61051-61100.
- 14) **Grilletto R. (1987)** La splendida vita delle mummie, Sugarco, Milano.
- 15) **Ham AW. (1971)** Istologia, Utet, Firenze.
- 16) **Ruffer MA. (1914)** Pathological Notes of the Royal Mummies of the Cairo Museum, *Mitteilungen zur Geschichte d. Medizin u.d. Naturwissenschaften* 13 (2), reprinted in M. Ruffer, *Studies in the Paleopathology of Egypt*, pp. 166-178.

- 17) **Tapp E, Stanwrth P, Wildsmith K. (1984)** The Endoscope in Mummy Research, in "Evidence Embalmed", ed. A.R., David and E. Tapp, Manchester University Press, Manchester, pp. 65-77.

**Author Address:**

Gaspare Baggieri  
Soprintendenza al Museo Preistorico  
ed Etnografico "Luigi Pigorini"  
Viale Eritrea, 91  
00199 - Roma  
Email: [margas@inwind.it](mailto:margas@inwind.it)