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Case report

A scream from the past: A multidisciplinary approach in a concealment of a corpse found mummified

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ABSTRACT

When a mummified body is found, it requires the forensic pathologist to determine the manner and cause of death. The mummified body of an older man was found walled in an alcove in a silicon-sealed bedroom, in a semi-supine position with the back on the floor and the legs on the wall. Two plastic bags covered the body. Having removed the plastic bags, the body was fully wrapped in a brown adhesive tape. At the scene, there was no evidence of microfauna. The subject's son stated that after his father's death, he concealed the corpse in order to obtain his annual pension. A postmortem CT scan was performed before the autopsy, which excluded traumatic injuries. The autopsy together with the toxicological and microscopic findings helped us to understand the manner of death. In this case, the mummification process developed under specific environmental conditions and a multidisciplinary approach was required in order to solve it.

1. Introduction

Mummification is a drying of bodily tissues in place of liquefying putrefaction.[1] During the mummification process, water is expelled from tissue, preventing bacterial putrefaction. Mummified soft tissue is dry, leathery and often gray-yellow to brown in color, and adheres to bone tissue. Internal organs are smaller in size but preserve their shapes and structures, allowing it to be studied through histological samples after certain specific procedures.

Mummification commonly occurs in a dry environment, preferably with a moving air current, which is usually but not exclusively a warm place, and situated within an area with a specific degree of environmental oxygenation. However low body weight, being malnourished, dehydrated, having bled out a lot, and skin injuries such as abrasions or burns can facilitate the mummification process. Specific molds can also have an affect on mummified bodies, which is stressed in the literature.[2] Bodies of children and elderly are more susceptible to mummification, due to their thinner skin and more dehydrated tissue [3,4].

The process of artificial mummification was used for millennia worldwide in order to preserve the bodies, and to permit them access to the afterlife.

Nowadays, the finding of a mummified body in a domestic environment is rare, despite being more common in some countries than in others. It is usually due to social isolation of the subject when alive, with a complete or near-complete lack of contact with people and society. Commonly, the subjects are elderly men who are found in their homes several years after their death.[5]

When a mummified body is found, the forensic pathologist must perform a careful evaluation of all the available data, since the manner of death could be related to suicide, homicide, or reveal the concealment of a corpse.

We present the case of an 83-year-old white male, found mummified and bound with tape, covered with two plastic bags, and walled within an alcove built inside his bedroom. The strange thing about this case is that the mummification process occurred in an environment characterized by features very different to those described in the literature (a hot and dry environment with an air current). The mummification process found in this case was

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consistent with the peculiar process of the Anaerobiasis mummies, as described by Aufderheide.[6]

2. Case

A police team was in an apartment in the suburbs of Rome, searching for hidden weapons. During the investigation they found a silicon-sealed door on the 2nd floor. On opening the door, there was a bedroom in a considerable mess with a silicon-sealed window. The floor was covered with white-colored dust and rubble. In one corner of the room, an abnormal protrusion of the wall was discovered. Having demolished the wall, a dead body was found inside in a semi-supine position with the back on the floor and legs on the wall (Fig. 1). Two plastic bags covered the body. Once the plastic bags were removed, the body was completely covered in a brown adhesive tape (Fig. 2). No microfauna was observed near the body.

The owner of the apartment declared that the body was his father, who died two years before due to cardiovascular disease. After his father's death, the son concealed his corpse in order to obtain his annual pension. According to the family doctor, the subject suffered from cardiovascular disease with a past episode of myocardial infarction. Before sealing the body, the son dressed his father in funeral clothes. The body was taken to our Office of Forensic Medicine.

2.1. Identification and autopsy findings

Despite the presence of an ID card in the pocket of the trousers, an identification process was performed in order to confirm the body's identity. The PMCT examination showed no presence of teeth so dental identification was impossible. As a result, we collected a sample from the psoas major muscle to proceed with DNA analyses. A sample of DNA from the subject who claimed to be the son of man who died was also collected. DNA results were consistent with a family relationship between the men, confirming that the man who died actually was the father of the subject.

At the external examination, the body weighed 17 kg and was 149 cm in height (Fig. 3). After washing the body, no traumatic injuries were found. The skin had a dry appearance, of yellow to brown color and a leathery consistency. It especially adhered to the prominent bones-the cheekbones, chin, ribs and pelvis. Body hairs were present, but they were easily detachable. Mold spores were observed on the body's surface, especially on the feet.

A postmortem CT examination was performed before the traditional autopsy, showing no traumatic injuries or bone fractures (with special regard to hyoid bone fractures), but osteoporosis and osteoarthritis.

At the postmortem examination, the skin and underlying tissues were hard, making autopsy dissection difficult. On entering the body cavities, all the internal organs were mummified and slightly decomposed, but they still maintained their general appearances and structures (Fig. 4). During the examination of the heart, the coronary arteries arose normally, followed the usual distribution, and showed significant atherosclerosis on the left anterior descending (occlusion of 85% of the vessel diameter) and on the circumflex (occlusion of 80% of the vessel diameter). The lungs were decreased in size, but no abnormal findings were observed.

Toxicological analyses performed on hair, liver, kidney and muscle samples were negative for drugs, alcohol and common poisons.

Finally, we performed a microscopic examination of the organs and tissues. We rehydrated the mummified tissues using Ruffer's solution (5:3:2 distilled water, ethanol and 5% aqueous sodium carbonate), followed by formalin fixation. We collected samples from suspicious skin areas (e.g areas of darker skin) and multiple random skin samples from the main body usually affected by violent incidents (such as the neck, hands, forearms and legs). Traditional and immunohistochemistry microscopic analyses were performed on the skin samples, showing no injuries or other anomalies. During the microscopic examination of the heart, strongly decomposed tissue with interstitial fibrosis and wavy fibers was observed (Fig. 5). The microscopic examination of the lungs showed putrefactive changes along with moderate congestion, but no abnormal findings were observed. Despite this autolysis, no pathological findings on any other organs were present. According to all the available information, we excluded a violent death and stated the death as natural, probably due to atherosclerotic cardiovascular disease in an elderly man who suffered from a long-term heart disease.

3. Discussion

The English word mummy is derived from the medieval Latin "*mumia*", a borrowing of the medieval Arabic word "*mūmiya*" and from the Persian word "*mūm*". This word means an embalmed corpse, and as well as the bituminous embalming substance, it describes the brown-black discoloration due to the resinous substance used to mummify the body.[2] The mummification process was first developed and used by the Ancient Egyptians. The Egyptians had such a love for life that it was important that they continued that enjoyment even after death. They spent large amounts of time preparing for the afterlife, according to their religious beliefs. The Egyptians believed that the mummy housed their soul, so they developed the process of mummification to

Fig. 1. A. Unusual wall appearance inside the silicon sealed bedroom. B. Dead body found after the demolition of the masonry ledge.