

MUMMIFICATION IN A CASE OF HANGING – A CASE REPORT

Comment [A1]: MUMMIFIED DEAD BODY IN HANGING POSITION; A CASE REPORT

Abstract:

Background: Mummification refers to all natural and artificial processes that bring about preservation of the body or its parts. Such processes include mainly the drying of the soft tissues instead of liquefying putrefaction. Case: We are presenting here a case of medicolegal autopsy performed at mortuary of MGIMS, Sevagram. The body was found in jungle in hanging position to branch of tree. Body was completely mummified. Facial identification could be making out as facial features were well maintained. Investigation agency has query regarding condition of the body (mummification) and what is the time since death. After performing the autopsy, police were explained regarding the factors responsible for mummification to occur in the dead body and also given opinion regarding time since death. From the time since death police investigated the various missing complaints which were present at neighboring police stations during that period. So the relatives from one of the missing person identified the body and it was handed over to relative after completion of all legal formalities by the police officials. In this case report we have discussed; autopsy finding in mummified body and factors responsible for formation mummification of the body. Conclusion: Hot, dry and airy environment are well known factors contributing the mummification of body but apart from this hanging of the body along with other contributing factors mentioned earlier is responsible for mummification of the body in present case.

Keywords: Mummification, Putrefaction, Hanging.

Comment [A2]: Hanging body

Comment [A3]: Autopsy.

Introduction:

Mummification is a modification of putrefaction. Dehydration or drying and shriveling of the cadaver occurs from the evaporation of water, but the natural appearances of the body and general facial features are preserved¹. Mummification refers to all natural and artificial processes that bring about preservation of the body or its parts. Such processes include mainly the drying

of the soft tissues instead of liquefying putrefaction. The essential requirement for mummification is a dry environment, preferably with a moving air current, which is usually a warm place. During the study of this case we have gone through various literatures available on mummification of the body. From detail postmortem examination of our case and data available from various literatures it is evident that hanging can be the one of the contributing factor which is responsible for formation of mummification of the dead body.

Case Report:

In present case a body was brought by police to mortuary of MGIMS, Sevagram. As per police inquest, the body of the deceased was found hanging to a branch of tree with a nylon rope around the neck in open area of jungle in month of May. It was hot and dry summer weather at that time.

External Examination:

- On external examination apparent age of the body was about 25 years. Body was emaciated. Body was clothed with pant & shirt and a white colored nylon rope (Ligature material) was also present with the body encircled around the neck. Body was thin, emaciated and mummified with retained natural appearance and facial features.
- Skin was dry, hard, leathery and brown in color and adheres closely to bones. Multiple small holes were present on the skin near bony prominence at shoulder and on chest. These holes were irregular in appearance and without any vital reaction. Postmortem Lividity was not appreciated due to mummification. Fingernails & toe nails were intact and not possible to remove easily. Scalp hairs were dried, intact not possible to remove easily.
- Beetles insect were seen inside the body cavity.
- Tongue was not visible inside the oral cavity which might have been disappeared due to decomposition as well due to eating by insects. Lips are partially disintegrated and nasal bone was exposed.

Examination of neck:

- Neck region was stretched. One ligature mark seen on the neck. The mark appears to be single & is 24 cm in length. The breadth of the mark is 2.5 cm. In the middle on anterior aspect, it is situated above the level of thyroid cartilage, 4 cm below from the level of both

right and left ear lobule, encircling horizontally around whole of neck. The course of ligature mark is consistent with the course of inner round of the rope

- When neck was dissected after opening cranial and thoraco-abdominal cavity, by giving 'V' shaped incision on the anterior aspect. Internal cavity was hollow and no organs were present at its anatomical position and skin was brittle. Internal tissues may have been disappeared due to decomposition and or eating by insects. Hyoid bone was not present at its anatomical position. On search it was found in abdominal cavity. On examination it was intact. No other organs were found.
- No other injuries like fracture of the bones were appreciated and due to mummification and no opinion regarding the injuries whether they were antemortem or not were given due to extensive mummification.

Internal Examination:

- Scalp was intact and no fracture was seen. On removing the cranial bone, internal cavity shown presence of about 10 ml of black colored gel type material. Chest cavity was hollow due to extensive decomposition. No lungs and heart tissues are present in chest cavity and no rib fracture appreciated. Abdominal cavity was hollow and intestines and internal organs were absent. No blood and viscera were present in the body due to decomposition; hence, the viscera was not preserved. Ligature material (Nylon Rope) was collected, labeled and handed over to Police.

Opinion as to the cause of death:

- Main query of investigating police officer was what could be the cause of death in this case what could be the approximate time since death.
- No definite opinion regarding the cause of death was given in this case due to extensive decomposition and mummification of body. However, opinion was framed as 'Death due to hanging cannot be ruled out, as Postmortem findings were consistent with hanging'.
- Regarding time since death opinion was given as 'time since death is more than 3 weeks. This opinion was framed from reference of notable text book and available literature².

Discussion:

- Dry and hot environments preferably with moving air current, emaciation, little insect activity are favorable conditions for mummification. It takes more than 3 weeks for

extensive mummification of body to occur. These factors are evident from study on 15 mummies done by 'Celine Leccia'³ and also mentioned in case report by Carlo P⁴.

- In our case factor associated with the mummification were summer days, emaciated body, airy place and also time of missing of person was around one month. All these factors were also associated with above mentioned studies.
- In study by Jeanne Lynch-Aird⁵ where he studied decomposition pattern in 20 freshly killed pigs. The pigs were killed by gun and then hanged. He found that hanging was associated with mummification. Similarly in case study by 'Valentine Bugelli'⁶ it has been evident that there is delay in decomposition in hanging body which may leads to mummification.
- The delay in decomposition in hanging may result due to vertical body position; due to effect of gravity the body fluids shifts towards the lower parts which accelerate the desiccation of soft tissues on the upper parts. The effect of gravity can also explain the decrease of internal maggot mass as larvae easily fall from the hanging body to the drip zones below where they are unable to recolonize the body if it is totally suspended. Furthermore, in a hanging body a greater surface is exposed to wind and sun with a quicker skin drying preventing the additional diptera colonization.
- In present case body was in hanged position to branch of tree may be for more than one month as missing complaint of the person to whom this body belongs was already in nearby police station. Hanged position of body might have resulted in fall of maggots on ground and made them unable to recolonize in body due to height of the body on tree. In addition to this it was dry and hot atmosphere in month of May at the location where this case was found. As body was exposed to moving air current in open space, early desiccation of the body occurred. Similarly hanged position of the body also doesn't allow fluid to accumulate in the body part as fluids falls down on the ground due to effect of gravity.
- In case report by Francesco Ventura where he discussed the case of peculiar mummification it has been mentioned that low bacterial activity is responsible for mummification to occur.⁷ In his case factor responsible for low bacterial activity was anaerobic condition around the body as body was sealed in container with silicon lining. In our case also low bacterial activity is responsible for mummification to occur but factor responsible for low bacterial activity was drying of the body due various factors as mentioned above.

Comment [A4]: Diptera? or dipteral?

- When body get mummified it becomes place for nesting by various insects and animals. This has been evident from the study by Łukasz Szleszkowska⁸. In our case also there were lot of beetle insects were present in body cavity.

Conclusion:

- Delay in decomposition activity plays important role in mummification of the body.
- Dry and hot environments, emaciation, time period of more than one month and hanging position are well known factor which reduces decomposition activity of the body and thus result in mummification of the body. All these factors were associated in our case.
- Apart from this hanging of the body in open airy space can be the important factor for development of mummification which is evident from our case and also evident from various studies mentioned in discussion section.

Ethical clearance: Taken from institutional ethics committee

Photographs:

1) Preserved facial features



2) Elongation of neck



3) Thin Emaciated body

4) Empty body cavity



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Comment [A5]: Please check their presense in the text

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