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Case Report

Postmortem Artefacts Due to Ant-bites- A Case Report

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Abstract

The Post-Mortem artefact is defined as "any change caused or any feature introduced into the body after death (accidental or physiologically unrelated finding to the natural state of the body), that is likely to lead to misinterpretation of medically significant ante-mortem findings." Post-Mortem Artefact is any physiologically and pathologically unrelated alteration or introduction of new features into the deceased to its natural state and is likely to cause misinterpretations for the investigators or for a layman who is unfamiliar with this phenomenon. In this case dead body of 17 year old female was found in hanged condition with multiple abrasion marks over face, eyes, armpits, and genitals. The primary investigation and presumption of police was it is a case of rape with murder but during Post-Mortem it was found that injuries over the genitalia were due to ant-bite, detailed case report is given bellow.

1. Introduction

'What the mind does not know, the eyes do not see.' – Socrates.

The word "artefact" is derived from the Latin words, arte, meaning "by skill" and factum, meaning "things made."[1] The artefacts, to some extent, are observer-dependent, in as much as a same finding may confuse a beginner, but may easily detected as spurious or an "artefact" by an expert.[2] Such artefact may be introduced before death, at the time of death or after the death.[3] It is important for the autopsy surgeons to know the various types of artefacts. The knowledge helps to avoid erroneous diagnosis and wrong conclusions. Ants belong to the family Formicidae of the order Hymenop-tera, and they are one of the world's dominant insect groups. In the faunal succession Hymenoptera is the third most numerous order of insects (after Diptera and Coleoptera), containing more than 50species frequenting carrion, among which Formicidae is the most representative family. These data were first illustrated by Bornemis-sza[4]on guinea pigs and confirmed later by Payne[5]

This paper primarily focuses on the post-mortem artefacts by ant-bite and how each artefacts can be ruled out in the post-mortem examination. It also focuses on those factors which might influence the formation of artefacts to highlight the preventive measures that can be taken to minimize artefacts.

2. Literature:

Classification of artefacts: i. Based on the period

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of introduction of artefacts into the body, artefacts are primarily classified in to

a. Those introduced between death and post-mortem examination.
b. Those introduced during post-mortem examination.[5]

Both these types are further classified into various sub-types based on the mechanism of the artefact formation.

ii. Postmortem artefacts may be classified as follows based on the cause of the artefact formation.

a. Encountered during Postmortem examination
b. Artefacts of decomposition
c. Third party artefacts
d. Artefacts of environment
e. Other artefacts.[3]

iii. Another way of classification of artefacts is as follows-

a. Those introduced prior to death – (therapeutic artefacts)
b. Those occurring during the process of death – (agonal artefacts)
c. Those introduced after death – (other artefacts).[2]

Though all these are justifiable, it becomes difficult to have different classifications for the same artefacts.

iv. For the convenience of our easy[6] understanding and analysis, the above-mentioned classifications can be combined as follows-

I. Artefacts introduced between death and Post-mortem examination [4,6]

(a) Agonal artefacts
(b) Artefacts due to Postmortem changes
- Related to rigor mortis
- Related to hypostasis
- Related to autolysis
- Related to putrefaction

(c) Third party artefacts
- Insect / animal activity
- Therapeutic / resuscitative artefacts
- Deliberate mutilation / dismemberment
- Embalming artefacts

(d) Environmental artefacts
- Effects of heat
- Postmortem corrosion
- Postmortem maceration

(e) Miscellaneous artefacts
- Refrigeration artefacts
- Mishandling of the body
- Interment and exhumation artefacts
- Due to delay in autopsy
- Toxicological artefacts
- Artefacts associated with accidental deaths

II. **Artefacts introduced during autopsy/ Autopsy pathologist induced Artefacts**[7]
- Air in blood vessels
- Skull fractures
- Visceral damage
- Injury to blood vessels
- Extravasation of blood
- Fracture of hyoid bone
- Toxicological artefacts

2. Case Report:

Dead body of 17-year-old female was found in hanged condition at her home by her parents at 11pm at night. Hanging was done by "Dupatta" to a fan inside her bedroom. Room was locked from inside. After opening the room by breaking the door lock her parents has released her by cutting the ligature material and her body was kept on the bed for 3-4 hrs.

Afterwards when police have arrived, they found multiple ants over the body with multiple abrasion marks over face, eyes, armpits, and genitals. The primary investigation and presumption of police was it is a case of rape with murder so body was referred for Postmortem examination.

Figure 1: Injuries around Neck

During **Postmortem examination** following things were noted 1) Ligature mark of size 9 cm x 0.5 cm over the neck, anteriorly, above thyroid cartilage, it is going upward, backward, posteriorly, obliquely, deficient on posterior side of the neck (**Figure 1**). On dissection, underlying the ligature mark infiltration of blood is seen in muscles. 2) A superficial incised wound

of size 4 cm x 0.2 cm present over left wrist joint tailing on medial side with multiple hesitation cuts were present by the side of the injury. 3) Multiple pinpoint small abrasion injuries present around the mouth, both eyes (**Figure 2**), in armpits (**Figure 3**), over the genital area (**Figure 4**)and also around injury no -1 &2 (**Figure 1**), Pale in colour which are Postmortem in nature. After examination with magnifying lens, we confirmed that these are possible by ant bite and these are artefacts. There were no other injuries over the genitalia and hymen was intact.

Figure 2: Ant bite injuries around mouth & eye.

Figure 3: Ant bite injuries in and around armpits.

Figure 4: Ant bite injuries at genital area.

After autopsy cause of death was given as "Asphyxia due to hanging with incised wound over the left wrist joint however opinion reserved pending for chemical analysis reports." The report of viscera which was kept for chemical analysis was negative. There was no detection of any spermatozoa in oral, vaginal and anal swabs. Pubic hairs have not shown any foreign body hairs. Nothing was detected in nail clippings. Skin from injury site was kept for histopathology examination and report has shown that injury was anti-mortem in nature.

3. Discussion:

Artefacts were more frequently encountered in the cases that died in the evening time, i.e., 6.01 p.m. to 12 midnight as the deaths in this period might not be noticed immediately. In this case also same findings were seen. Pertaining to the post-mortem interval, maximum number of artefacts were seen those bodies that were autopsied 36 hours or more after death, while very few were documented in the early post-mortem interval within 6 hours. This gross difference is due to the formation of decomposition artefacts and anthropophagy artefacts in the bodies autopsied 36 hours after death.[8] In this case also there was delay in Postmortem so ant-bite artefacts were occurred. In the study of Sudheer and Sekhar, artefacts due to decomposition is the major contributor (35%), insect and animal activity accounted for 15% and therapeutic and resuscitative artefacts for 12%.[9]

The pale abrasions and nibbling / gnawing marks at the margins of the injury are suggestive of the post-mortem ant-bites, rodent-bites and maggot activities. Hand-lens examination and histo-pathology helped in arriving at the conclusion. In this case there was time lapse of 10-12 hours between death and autopsy. During this time body was kept at home for 4-5 hrs on bed without attention till police has arrived. During this time multiple ants were seen which are present over the moist parts of body i.e., mouth, eyes, arm-pits, genital areas and injury sites. Marks produced by these insects are dry, pale and have irregular margins. As they become drier, they resemble as brush burns. Careful examination by magnifying lance will differentiate these artefacts from ante-mortem injuries. In this case Histopathology report also showed that abrasion was post-mortem in nature. Also oral, vaginal and anal swabs were negative for semen. Viscera reports were also negative so final cause of death was given as "Asphyxia due to hanging with incised wound over the left wrist" (Unnatural).

4. Conclusion:

Artefacts are a common phenomenon in the forensic practice. These artefacts could be from anywhere right from the process of death to shifting the body to the dissection table. The source of artefacts might be anything such as therapeutic and resuscitative wounds or the process of dissection itself. The body would be subjected to trauma by a variety of predators, relatives and morgue attenders. Even the Postmortem changes which are inevitable and unavoidable in any dead body& it can present with enumerable artefacts. Hence it becomes impossible to bypass these artefacts.

Unawareness of the facts of possibility of artefacts may lead to misinterpretation and confusion to investigating agencies and the directions of investigation will change with probability of consideration of wrong possibilities. On the other hand, wrong interpretation of these artefacts by experienced Postmortem Medical officer may indirectly misguide the investigating officer and investigations may proceed with wrong assumptions.

So Medical officers performing the autopsy should be able to distinguish artefacts from significant ante-mortem changes and draw logically and correctly, instead of forming hasty judgements.

5. Recommendations:

1. The knowledge of diverse types of artefacts that would present in any medico-legal autopsy is the foremost requirement for avoidance of misinterpretation.
2. To rule out artefacts, relevant history should be sought from the investigating officers pertaining to the circumstances of death, time and date of death, place of retrieval of the body stressing on the surrounding environment, position and condition of the body.
3. History from the relatives should be collected related to the previous illness and treatment history of the deceased.
4. History should be elicited pertain to the hospital admission prior to death including the therapeutic and resuscitative measures taken.
5. Discussing with the doctor who last treated the patient or referring the treatment details from the case sheets would be useful.
6. Whether body was preserved in cold storage or not.
7. History should be taken from the relatives about the manoeuvres they did to retrieve the deceased.
8. Provision could be made to take the photographs of the dead body at the time of keeping inside the cold chamber and the same could be handed over to autopsy surgeon at the time of autopsy.
9. Extreme care should be employed while shifting the body to the cold chamber as well as to the dissection table or during removal of clothing. Anything occurs in the process need to be documented in the case sheet.
10. Periodic fumigation of cold-chamber and dissection hall should be done. Appropriate measures need to be taken to keep the mortuary and cold chamber animals, insect, birds and rodent-free.
11. Dissection should be conducted in an ideal mortuary set up with sufficient lightning.
12. Proper dissection techniques as advocated in the text books should be employed with proper instruments.
13. The visceral samples for forensic science laboratory, pathology, microbiology and biochemistry should be promptly preserved with correct quantity of correct preservative, sealed and labelled under supervision before finishing the case so as, to prevent the toxicological artefacts.
14. Samples collected for histopathology or chemical examination should be noted in the P.M. report and if the body is sent for embalming, the same should also be documented.
15. Whenever necessary or doubtful, photography and videography of the autopsy should be done for future reference.
16. If need arises, senior colleagues can be consulted with relevant documents and doubtful findings by photography before giving an opinion.

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