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Complex Murder: A Forensic Dilemma

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Abstract: Common saying is that everything is fair in love and war and sometimes, the love itself is the reason for the war. Here is a case report on a planned homicide by elaborate forethought and mens rea and a well connived plot to electrocute so that the homicide may be passed off as an accidental occurrence but impromptu decision of thereby strangulating, leaving no chance of survival led to this case being referred from a General hospital in Haryana to PGIMS, Rohtak in view of having now, two different possible causes of death, one being constriction of neck by ligature and the other, electrocution. On postmortem, it was found that the cause of death was strangulation by ligature and electrocution injuries were inflicted in the antemortem period. Therefore, this case stresses upon the very known fact that a thorough autopsy, keeping in view the plausible causes of death and accessory evidence should be conducted so as to help reconstruct the crime in order to aid the investigating agencies, there by aiding justice.

INTRODUCTION

The term 'complex murder' is used here in the same context as the well known 'complex suicide'. Complex suicide refers to suicides in which more than one suicide method is applied. Sometimes, it's that the suicide starts off with one method but either due to its failure or delay and painful experience ends up adapting other method and die subsequent to it. While other a times, it is just the suicide doesn't want to take chance and takes up multiple measures to end his/her life. Complex murder, on same lines is a term which is referred here wherein the accused in our case alleged to have first electrocuted and then strangulated the deceased, just to be sure that the job is done. In this case, we discuss the dilemma of exactly diagnosing "the cause of death", as either electrocution or strangulation as both presented with antemortem occurrence when either could have been a perimortem incident.

HISTORY

On one morning in the month of October, a newly married wife woke up her mother-in-law stating that daughter-in-law's husband is not there in the bedroom where they slept together last night and even electricity wasn't there too. They both then came to the bedroom where they discovered the body of her husband with electric wire in his hand, close to the inverter. He was then taken to hospital in hope of him being alive but was declared dead on arrival. When his father saw the body, he noticed a ligature mark on the neck and suspected it to be a case of hanging due to ongoing family quarrels of his son and daughter-in-law. So, considering the perplexing circumstances of the case, it was referred to PGIMS, Rohtak for postmortem examination.

AUTOPSY FINDINGS

A. *External findings:*

A dead body of a well built and nourished male was brought for postmortem in his night clothes. Rigor mortis was well developed all over the body. Post mortem lividity was present over the back except pressure points and was fixed. The conjunctiva was congested and showed petechial haemorrhages.

➢ *External injuries:*

1. A reddish brown ligature mark situated transversely with slight obliquity on back, was present around the neck, situated just at the upper margin of thyroid cartilage, 5 cm below the centre of chin, 4 cm below the right angle of mandible, 3.5 cm below left angle of mandible and 6 cm below the external occipital protuberance. The mark was missing on left lateral and back of neck and partly on the right side on the outer aspect of neck. The mark was hard and parchmentised. Multiple linear reddish brown abrasions of size varying from 0.5-1 cm × 0.3-0.5 cm were present above and below the mark on neck, over the inferior aspect of chin and on either side of fronto-lateral and lateral aspect of neck. (Image 01) On dissection, the tissues underneath showed ecchymoses. (Image 02)
2. Multiple reddish abrasions, varying in size from 0.5cms to 2cms x 0.3cms to 0.5cms were seen over either side of forehead, left cheek, front of left ear pinna, over left mastoid, bridge of nose. The tissue underlying these showed ecchymosis. (Image 03)
3. Reddish contusion of size 1x0.5 cms was present over the right side of forehead, 0.5cms above the lateral one third of the right eyebrow. On dissection, underlying tissues showed ecchymosis.
4. An oval electric burn mark of size 0.5-0.3 cm was present in the first web space between right index finger and thumb, close to dorsum of the hand. The mark was a shallow crater like with raised margins and the floor of the crater was pale and the underlying skin tissue appeared flattened. (Image 04)
5. Linear electric burn mark of size 2.0 cm × 0.5 cm, horizontally placed was present over the back of right ring finger's proximal phalanx in its middle one third. This mark was corresponding to the metallic ring which the deceased wore. The burnt area was dry, hard, firm with rugged edges with a pale blanched zone around thus indicating survival. (Image 05)
6. Linear vertically placed electric burn marks of size 2×0.2cms, 1.5x 0.2cms and 2.5x 0.2cms respectively, were seen over ring finger's distal phalanx, middle finger's middle phalanx and thumb's distal phalanx on the palmer aspect of right hand. The burnt area was dry, hard, firm with rugged edges with a pale blanched zone around. (Image 05)
7. Two reddish oval shaped splitting lacerations were present over dorsum of right foot; 2 cm proximal to the base of great toe and second toe respectively.
8. Two reddish abrasions of sizes 1.0x 0.5cms and 1.5cms x 0.5cms were seen over the back of right elbow and middle one third of right forearm.

B. Internal findings:

1) Cranium and spinal cord region:

- No bony abnormality was seen.
- Brain showed congestion with focal areas of Subarachnoid haemorrhages over at places, more so over frontal and occipital lobes.(Image 06)

2) Thorax region:

- No bony abnormality was seen.
- Larynx and trachea showed ecchymosis of soft tissues around thyroid cartilage. Epiglottis and upper tracheal mucosa were congested.(Image 02)
- Both lungs showed congestion and were edematous.
- Heart was full of dark fluid blood. Pin point petechial haemorrhages were present over the apical part of right ventricle.(Image 07)

3) Abdominal region:

- Viscera were congested in general.

INVESTIGATIONS

The skin from the site of electric burns over the right hand was sent for histopathological examination which showed coagulation necrosis and flattening of cells

- Chemical analysis showed presence of benzodiazapenes in blood as well as viscera.

DISCUSSION

The first fatal electrical injury reported in scientific literature was in France in 1879 (Jex-Blake, 1913).Since the first case, the annual number of electrical injuries and deaths from electric shock has steadily increased as a result of widespread use of electricity and the application of electrically powered machinery.[1] This passage of substantial electric current through the tissues can cause skin lesion, organ damage and death. This injury is commonly called 'electrocution,' though some would use this term only if death occurs.[2] Electrical injury is well recognized as a cause of death and it falls in the class 'external causes of death'. In the 10th revision of ICD, this is the class XX with codes W85, W86 and W87.[1]

For this biological damage to occur, the body must be incorporated into an electrical circuit, so there is a passage of electrons through the tissues, in fatal cases, through vital structures.[2] The current needed to produce death varies according to the time during which it passes and the part of the body across which it flows Usually, the entry point is a hand that touches an electrical appliance or live conductor, and the exit is to earth (or 'ground'), often via the other hand or the feet. In either case, the current will cross the thorax, which is the most dangerous area for a shock because of the risks of cardiac arrest or respiratory paralysis.[3] Amperage is the most important factor in electrocution. Since voltage is usually constant, the main factor in determining the amount of amperage that enters the body is the resistance, as expressed in ohms. It is a well known fact that Direct current (DC) is less dangerous than alternating current (AC): a current of 50-80 mA AC can be fatal in seconds whereas 250 mA DC for the same time is often survived. Alternating current is four to six times as likely to cause death, partly because of the 'hold-on' effect which is the result of tetanoid muscle spasm and prevents the victim from releasing the live conductor.[2]

In fatal electric injury cases, depending on the shortest path taken up by the current, the cause of death varies and so does the autopsy findings. In cases, wherein the death occurred due to cardiac arrhythmia, there is little to find at autopsy apart from the skin lesion indicating the entry and exit sites of the current. These skin lesions may be absent or difficult to observe if the electrocution occurred in wet environment like a bath tub. If there was respiratory involvement because of intercostals muscles and diaphragm which go into spasm or are paralyzed, it leads to congestion and cyanosis of face with similar changes in lungs, which again are too non specific. [2]

The skin lesion which if present, may be difficult to differentiate it as antemortem or postmortem. The burns indicate only that current has passed through skin. [4] It has been conclusively shown by Polson and others that the burns can be inflicted on a dead body, the appearances being similar in terms of blistering and burning, though the red flare of 'vital reaction' will be absent if death occurred sometime before. The skin lesions are mainly thermal in nature, but opinions vary as to whether histological appearances are specific to electricity.[3] It is said that changes such as nuclear elongation, pyknosis, and pallisading appear in electrical injuries and intraepidermal separation is most frequent in electric injuries.[5] However, studies have now shown that similar nuclear elongations may occur in thermal burns, blunt traumatic skin injuries, cauterization, drying, and freezing and around blisters due to barbiturate poisoning.[6] The gross findings in internal organs may be absent and even histo-pathological changes are a matter of controversy. Because the internal tissues are largely aqueous and contain conductive electrolytes, the current pathway is usually too diffuse to cause thermal damage.[2]

Nowadays, cases wherein no electrical injury is visible on skin, histopathological examination and energy-dispersive X-ray spectroscopy for metallization can provide evidence for forensic diagnosis.[7, 8] Even in cases where in the etiology of death is known to be electrocution, the forensic biochemistry enzyme levels assay of creatine kinase MB, cardiac troponin, serum uric acid and creatinine can be analysed which may indicate as to the mode of death, namely a cardiac origin or respiratory one.[9]

Strangulation, on the other hand is mainly an autopsy diagnosis which is concluded upon due to presence of stigmata signs of asphyxia wherein the evidence of violent compression or constriction of the neck during life is obtained from the presence of bruising or ecchymoses about the marks of the neck, haemorrhages in the strap muscles, under the skin, in the sides of the tissues around the trachea and larynx, in the larynx and in the laryngeal structures themselves. The ligature mark alone is not diagnostic, for it may be indistinct or absent, if a soft ligature material is used. In the absence of ligature mark in the neck or deeper injury, it will be difficult to form an opinion, except from circumstantial evidence.[10]

However, in our case, the cause of death was opined to be asphyxia as a result of strangulation coupled with antemortem electrocution. This was concluded on the basis of antemortem findings observed underlying the ligature mark which were to extensive to have been survived and electric joule burn which too presented with surrounding hyperaemia on gross appearance and histopathologically, as were the findings in the viscera which suggested congestion and there by haemorrhaging.

CONCLUSION

Strangulation in its face value is homicidal in nature whereas electrocution is not a common mode of homicidal

death. Electrocution coupled with strangulation as a means of committing murder and both presenting as antemortem injuries is a rare event in itself though cases have been reported where in deaths by homicidal strangulation were unsuccessfully masqueraded by postmortem electrocution.[11,12]

CONFLICT OF INTEREST None declared

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Image 03. Multiple abrasions over the face

Image 04 . Electrical injury (Joule burn) in the form of crater in the first web space.

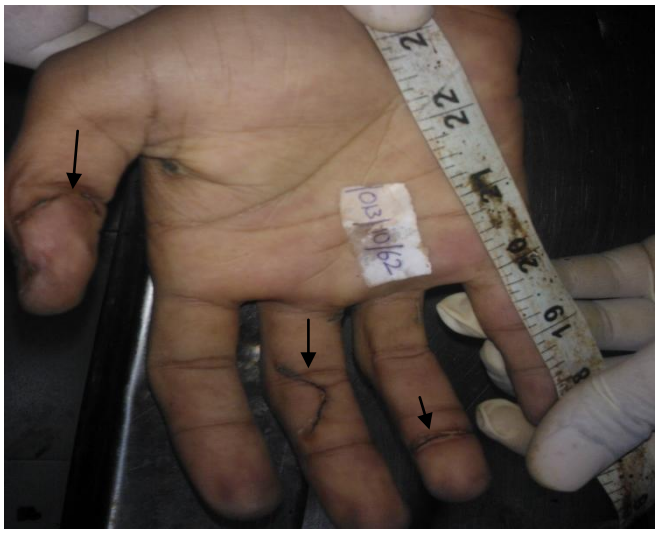

Image 05. Joule burn in the first web space and linear electric marks on fingers of right hand with a blanched zone around each mark

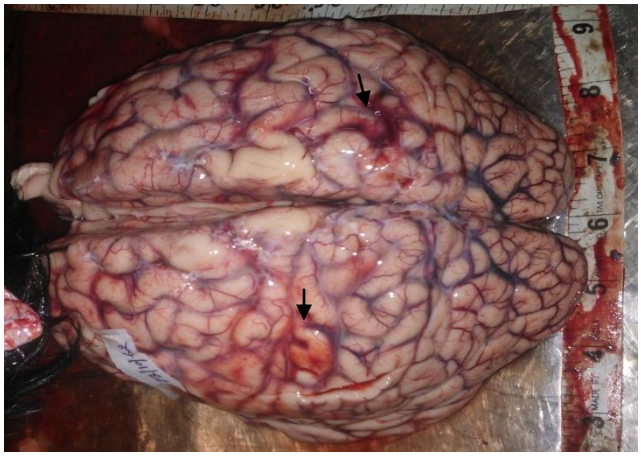

Image 06. Congestion and focal subarachnoid haemorrhages over brain

Image 07. Petechial haemorrhage on the epicardium of heart (right ventricle near apex)