



Case Report

Death Due to Blunt Force Trauma Disguised as Suicide by Hanging: A Case Report

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ABSTRACT

Background: Simulated hanging, also referred to as pseudohanging or postmortem suspension, is a form of death-scene manipulation in which a body is positioned to resemble suicidal hanging. Distinguishing true hanging from simulated hanging remains a medicolegal challenge because no single autopsy finding is pathognomonic.

Case Presentation: A 31-year-old woman was reported to have been found in a hanging-like position on the stairs of her house. Initial scene information suggested suicide by hanging. External examination revealed fixed purple-red livor mortis, complete rigor mortis, abrasions and contusions on the face and scalp, and no characteristic ligature mark on the neck. Internal examination showed right scalp hemorrhage, subdural and bilateral subarachnoid hemorrhage, blood extravasation in the neck soft tissues, and an intact hyoid bone. The available record did not document the measured volume of the intracranial hemorrhage, a detailed map of subarachnoid extension, the presence or absence of cerebral edema, toxicological findings, histopathological confirmation, or interpretable touch-DNA results.

Conclusion: The integration of scene information, external examination, internal autopsy findings, and the limitations of the available supportive evidence indicated that simulated hanging was more probable than true suicidal hanging. The most plausible cause of death was blunt force trauma to the head with intracranial hemorrhage; however, the independent lethality of the intracranial hemorrhage could not be quantified because detailed volumetric and cerebral edema data were unavailable. This case emphasizes the need for complete medicolegal autopsy and careful correlation between scene findings and biological evidence when death is initially suspected to be suicidal hanging.

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Introduction

Hanging is a common form of mechanical asphyxia encountered in medicolegal practice. In suicidal hanging, the weight of the body produces pressure on the neck through a ligature, resulting in obstruction of venous return, arterial flow, and/or the airway [1, 2]. Despite its relatively familiar presentation, the interpretation of hanging deaths requires careful correlation of the death scene, ligature characteristics, external findings, internal neck findings, and supporting information.

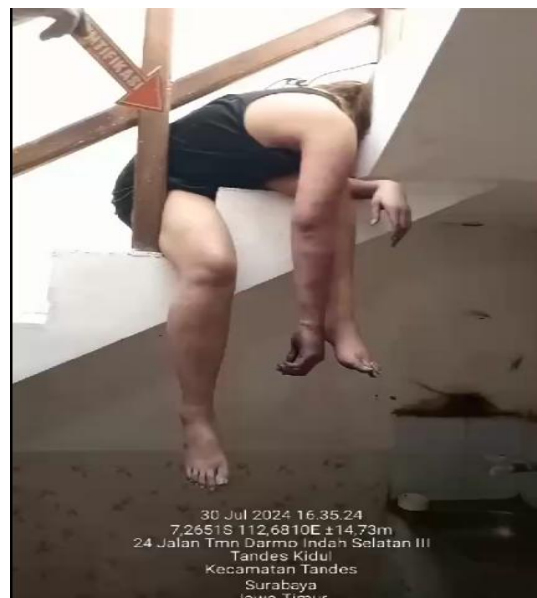
Simulated hanging is an attempt to conceal the actual cause or manner of death by positioning the body in a way that resembles suicidal hanging. This may occur when a body is suspended after death to mask homicide or another form of fatal violence [3, 4]. The diagnosis is particularly challenging because individual findings may be nonspecific and because some classical signs of hanging may be absent or modified by postmortem changes [3, 5].

Forensic literature emphasizes that deaths apparently caused by hanging should be approached with professional skepticism when the scene narrative does not match autopsy findings. Warning signs include the absence of a ligature mark, livor mortis inconsistent with the reported body position, unexplained facial or head injuries, and internal injuries that cannot be explained by the hanging mechanism [6, 7]. A complete autopsy is therefore essential in suspected hanging deaths, especially when the circumstances are unclear or inconsistent.

This case report describes a woman initially reported to have died by hanging. Subsequent medicolegal examination revealed critical inconsistencies between the scene and the physical findings. The report demonstrates how integrated analysis of scene data, thanatological findings, external injury patterns, internal autopsy findings, and supportive examinations can distinguish true hanging from simulated hanging.

Case Presentation

A 31-year-old woman was found deceased in her house on July 30, 2024. According to scene information, the body was discovered near the stairs above the kitchen, with an electrical cord around the neck and attached to the stair railing. The body was not freely suspended; instead, it was in a semi-prone or resting position against the steps. There was no obvious sign of struggle or major disturbance around the scene (Figure 1).



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Figure 1. Position in which the body was found. The body was in a semi-prone/resting position against the stairs rather than freely suspended.

The ligature material was reported in the case file as an electrical cord. The available documentation did not specify the cord width, number of loops, knot configuration, knot position, or degree of tightness at the time of discovery. The available record also did not contain a documented biological trace result from the cord. These limitations were considered when interpreting the absence of a visible ligature mark.

The case was investigated retrospectively using scene information, police documentation, external examination, internal medicolegal autopsy, and available supporting information. External examination included documentation of livor mortis, rigor mortis, decomposition signs, and injuries on the head, face, neck, trunk, and extremities. Internal examination focused on the cranial cavity, neck structures, thoracic organs, abdominal organs, and hyoid bone. No interpretable touch-DNA result was available from the case record; therefore, DNA evidence was not used to determine the cause or manner of death.

Toxicological analysis was not documented in the available case record. Consequently, intoxication, drug-facilitated incapacitation, or poisoning could not be evaluated from the available documentation. This absence was treated as a limitation rather than as negative toxicological evidence.

External examination revealed persistent purple-red livor mortis that did not disappear on pressure.

Complete rigor mortis was present but could still be overcome. Based on thanatological findings, the postmortem interval was estimated to be more than eight hours, and the overall findings were compatible with approximately 18-36 hours after death. No maggots were identified.

Multiple injuries were identified on the face and head. Several abrasions measuring up to 0.8 cm x 0.3 cm were found on the bridge of the nose. An irregular contusion measuring approximately 5 cm x 1 cm was present on the mucous membrane of the upper lip. A contusion measuring approximately 4 cm x 3 cm was identified on the right scalp, located about 8 cm above the external auditory canal. Bruises were also noted on



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Figure 2. External neck examination showing no characteristic ligature mark.

the extremities. No characteristic ligature mark was found on the skin of the neck (Figure 2).

Internal examination demonstrated blood infiltration on the right side of the scalp, measuring approximately 5 cm x 4 cm. Subdural hemorrhage was identified between the dura mater and arachnoid membrane, and subarachnoid hemorrhage was present in both cerebral hemispheres. Blood extravasation was identified in the neck soft tissues, including the right neck fat layer measuring approximately 3 cm x 1 cm and the left neck muscle layer measuring approximately 5 cm x 2 cm. The hyoid bone was intact (Figure 3). Petechial hemorrhages were observed in the lungs. The abdominal and uterine examinations did not reveal signs of violence.



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Figure 3. Internal neck examination showing blood extravasation in the right neck fat layer and left neck muscle layer. The hyoid bone showed no documented abnormality.

The principal inconsistency was the mismatch between the hanging-like scene and the autopsy findings. The absence of a neck ligature mark was not compatible with a typical intravital hanging mechanism. In contrast, the external facial and scalp injuries, intracranial hemorrhage, and neck soft tissue blood extravasation supported antemortem blunt force trauma. These findings indicated that the body had most likely been positioned after death to simulate hanging.

Discussion

Absence of Classic Ligature Mark

In true hanging, pressure from the ligature usually produces a recognizable ligature mark on the neck. The mark may vary according to the material, width, duration of suspension, and body position, but a pale or abraded groove corresponding to the ligature is commonly expected [2,7,8]. In this case, the neck skin showed no characteristic ligature mark despite the reported cord around the neck. This absence supported postmortem suspension only when interpreted together with the scene and internal findings (Table 1).

The absence of a ligature mark alone is insufficient to diagnose simulated hanging. Partial hanging, atypical suspension, soft or broad ligature materials, short duration of suspension, and postmortem changes may make a ligature mark faint or difficult to recognize [7, 9]. Therefore, the current interpretation did not rely on the skin finding alone. The diagnostic weight came from the convergence of the absent typical ligature

Table 1. Integrated comparison between true hanging and the present hanging-like case.

Parameter	Typical finding in true hanging	Finding in the present case	Interpretive relevance
Ligature material and mechanism	The ligature type, width, number of loops, knot position, and suspension mechanism should be documented.	Electrical cord reported around the neck and attached to the stair railing; width, loops, knot position, and tightness were not documented.	Incomplete ligature documentation limits interpretation of the absent neck mark.
Ligature mark	Usually present as an oblique, non-continuous groove; it may be faint or absent in partial or atypical hanging.	No characteristic ligature mark was found on external neck examination.	Not diagnostic alone, but inconsistent when combined with trauma and scene findings.
Body position	Complete or incomplete suspension may occur, but the body is usually supported by the ligature mechanism.	Semi-prone or resting position against the stairs; not freely suspended.	Raises concern for staging or postmortem positioning.
Craniofacial and scalp injuries	Not expected as a major finding except for minor contact injuries or agonal movement.	Abrasions on the nose, upper-lip contusion, right scalp contusion, and scalp hemorrhage.	Supports blunt impact before death.
Intracranial findings	Primary hanging typically produces hypoxic/asphyxial changes rather than focal traumatic bleeding.	Subdural hemorrhage and bilateral subarachnoid hemorrhage were documented, but volume and edema status were unavailable.	Supports head trauma, but independent fatality cannot be quantified from available data.
Internal neck findings	Soft tissue hemorrhage may occur with neck compression but may also be affected by artifacts.	Right neck fat-layer hemorrhage 3 cm x 1 cm and left neck muscle-layer hemorrhage 5 cm x 2 cm; hyoid bone intact.	Favors neck trauma when integrated with other findings, but histopathology was unavailable.
Supportive examinations	Toxicology, histopathology, and trace/DNA testing may support reconstruction when indicated.	No documented toxicology, histopathology, or interpretable touch-DNA result was available.	Important limitation; conclusion is based on integrated scene and autopsy findings.

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Source: Adapted from Knight's Forensic Pathology and contemporary forensic literature [2, 7, 8, 16].

mark with craniofacial trauma, intracranial hemorrhage, and internal neck soft tissue hemorrhage.

Intracranial hemorrhage and blunt head trauma

The scalp hemorrhage, facial injuries, subdural hemorrhage, and bilateral subarachnoid hemorrhage indicated significant head trauma. Hanging primarily causes hypoxia and vascular congestion, whereas focal blunt trauma can produce tissue disruption, bridging vein injury, vascular tearing, and intracranial bleeding [2, 10–12]. Therefore, the intracranial hemorrhage in this case was more compatible with blunt force trauma than with a primary hanging mechanism.

Nevertheless, the conclusion regarding fatal intracranial hemorrhage must be stated cautiously. The available case record did not include quantitative data on the volume of subdural hemorrhage, the precise extent of subarachnoid hemorrhage, brain weight, midline shift, herniation, or cerebral edema. For that reason, the hemorrhage was interpreted as part of a fatal

head trauma pattern rather than as an independently quantified fatal lesion. The most plausible cause of death was therefore blunt force trauma to the head with intracranial hemorrhage.

The distribution of external injuries on the lips, nasal bridge, and scalp further supports impact or assault before death. The combination of external craniofacial injuries and internal cranial hemorrhage is a strong indicator that head trauma was central to the death mechanism, although the exact severity of the intracranial bleeding could not be graded from the available record.

Blood extravasation in the neck soft tissues

Blood extravasation in the neck requires cautious interpretation because soft tissue hemorrhage may occur in neck compression, blunt trauma, dissection-related change, hypostatic hemorrhage, or other postmortem artifacts [12, 13]. In this case, the documented anatomical distribution consisted of

hemorrhage in the right neck fat layer measuring approximately 3 cm x 1 cm and hemorrhage in the left neck muscle layer measuring approximately 5 cm x 2 cm. Histopathological examination of the neck tissues was not available; therefore, microscopic vitality could not be confirmed.

Several mechanisms were considered. Neck compression by a ligature could produce soft tissue hemorrhage, but this explanation was weakened by the absence of a corresponding external ligature mark and by the non-suspended semi-prone body position. Direct blunt trauma to the neck could also produce deep soft tissue hemorrhage, especially when associated with craniofacial blunt injuries. A postmortem artifact could not be completely excluded because no histopathology was available. However, the coexistence of craniofacial injuries, scalp hemorrhage, intracranial hemorrhage, and deep neck soft tissue hemorrhage favored an antemortem traumatic mechanism when all findings were assessed together.

The intact hyoid bone does not exclude either hanging or neck violence. Hyoid fracture depends on age, ossification, force direction, and mechanism, and its absence should not be interpreted as proof that neck compression did not occur [2, 12, 13]. In this case, the intact hyoid bone was interpreted only as a finding that did not provide additional support for strong fracture-producing neck compression.

Additional Inconsistent Findings

Persistent livor mortis that is fixed may support a minimum postmortem interval of several hours, but reliable reconstruction of body movement requires documentation of its distribution. Because the available record did not include a detailed livor mortis map, the time since death and body repositioning could not be inferred from lividity alone [13, 14]. The estimated interval of more than eight hours reflected minimum thanatological evidence, while the broader estimate of 18-36 hours represented an overall interval based on combined postmortem findings rather than a precise time of death.

Petechiae in the lungs are nonspecific and can be observed in several forms of asphyxial and non-asphyxial death [15]. In this case, the more diagnostically important findings were the craniofacial blunt injuries, scalp hemorrhage, intracranial hemorrhage, and neck soft tissue hemorrhage. The absence of a classic neck ligature mark, the presence of multiple blunt injuries, and the internal cranial and neck findings formed a coherent pattern of trauma followed by scene staging.

Medico-legal interpretation

The most plausible forensic interpretation is that the deceased sustained antemortem blunt force trauma to the head and neck, with intracranial hemorrhage forming part of the fatal injury pattern. After death, the body was likely placed in a position resembling hanging. This interpretation aligns with the concept of simulated hanging, where a body is suspended or positioned after death to mimic suicide [3, 5]. From a medicolegal perspective, the manner of death is unnatural. The case highlights that a hanging-like scene should never be accepted as suicide without critical autopsy correlation, especially when biological evidence contradicts the scene narrative.

Forensic Implications

This case demonstrates the importance of a complete autopsy in deaths initially suspected to be hanging. Professional skepticism is required when death scene information and body findings are inconsistent. The absence of a ligature mark, the presence of unexplained injuries, and internal hemorrhage should prompt comprehensive examination of the head, neck, thoracic cavity, abdominal cavity, toxicology, histopathology, and relevant trace or DNA evidence when such examinations are available.

The diagnostic strength in this case comes from the convergence of multiple findings rather than a single sign. Scene documentation, external injury mapping, internal autopsy, and supportive examination are all necessary to identify possible staging and to prevent misclassification of homicide as suicide.

This report has several limitations. The case was analyzed retrospectively, and several details requested for a complete forensic interpretation were unavailable in the case record. These included the precise width and configuration of the electrical cord, number of loops, knot position, tightness of application, biological trace results from the cord, measured volume of subdural hemorrhage, precise extent of subarachnoid hemorrhage, brain weight, presence or absence of cerebral edema, detailed distribution of livor mortis, toxicological findings, and histopathological assessment of the ligature area or neck soft tissues. Accordingly, the conclusion was framed as the most plausible integrated medicolegal interpretation rather than as a determination based on a single pathognomonic finding.

Conclusion

This case was concluded to be more consistent with

simulated hanging than with true suicidal hanging. The determination was based on the integration of death scene information, external examination, internal autopsy findings, and the acknowledged limitations of the available supportive evidence.

The most plausible cause of death was blunt force trauma to the head with intracranial hemorrhage. The principal findings supporting this conclusion were the absence of a characteristic ligature mark in the context of a hanging-like scene, multiple antemortem craniofacial injuries, scalp hemorrhage, subdural and bilateral subarachnoid hemorrhage, blood extravasation in the neck soft tissues, and an intact hyoid bone. Because the volume and full extent of the intracranial hemorrhage and cerebral edema status were not documented, the fatal role of intracranial hemorrhage was interpreted cautiously as part of the overall blunt head trauma pattern. Complete medicolegal autopsy remains essential in all hanging-like deaths with inconsistent or suspicious findings.

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Conflicts of Interest

The authors report there are no competing interests to declare.

Ethics approval

This study has been approved by the Ethics Committee, Faculty of Dentistry, Airlangga University, Indonesia. Ethics certificate No.: 1176/ HRECC.FODM/XII/2025. Clinical trial number: not applicable.

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