

CASE REPORT

FORENSIC CHALLENGES IN ESTABLISHING VIABILITY AND CAUSE OF DEATH IN A MUTILATED AND DECOMPOSED CASE OF SUSPECTED FEMALE FETICIDE: A CASE REPORT

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ABSTRACT

Introduction: Female feticide remains a significant medico-legal and public health concern in India. Advanced decomposition and mutilation complicate autopsy interpretation and determination of live birth.

Case Presentation: A mutilated female foetus was recovered from rural Punjab in 2023. Only the lower abdomen, pelvis, and lower limbs were available. Measurements included length 33 cm, weight 1.2 kg, and foot length 6.5 cm. Female genitalia were identifiable. Advanced decomposition obscured postmortem changes. The umbilical cord (9 cm) was irregularly crushed, without haemorrhagic infiltration. Ossification centres were present in the talus, distal femur, and proximal tibia bilaterally. Internal organ distinction was impossible due to decomposition and missing organs. No vital reaction was observed at the wound margins.

Conclusion: This case underscores the interpretive limits of foetal autopsy under adverse conditions while reinforcing the urgent socio-legal imperative to address sex-selective practices. The case illustrates key forensic challenges: inability to determine live-birth status due to absence of lungs and decomposition; viability assessment supported by ossification centres (~28–30 intra-uterine weeks); and differentiation of postmortem mutilation from antemortem trauma, with findings favouring scavenging. Emerging literature highlights the value of integrating taphonomic knowledge, virtopsy, and meticulous documentation of both positive and negative findings to strengthen medico-legal conclusions.

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INTRODUCTION

Female feticide, defined as the deliberate termination of female foetuses due to gender bias, persists as a critical medico-legal and socio-cultural issue in India. The underlying motives for female feticide include a strong societal preference for male children, entrenched patriarchal values, economic considerations such as dowry, and the perception of sons as providers of financial

security and family lineage. Despite initiatives such as the Beti Bachao, Beti Padhao campaign and enforcement of the Pre-Conception and Pre-Natal Diagnostic Techniques (PC-PNDT) Act, sex-selective practices persist, contributing to continued skewing of the sex ratio at birth^{1,2}.

The forensic pathologist plays a pivotal role in documenting such cases, particularly when mutilation or decomposition obscures accurate interpretation. Modern approaches, including virtual autopsy and advanced imaging, have been proposed to improve diagnostic accuracy when conventional methods are limited³⁻⁵.

CASE PRESENTATION

In September 2023, the local police recovered the remains of an unidentified foetus from an open field in a rural village of Punjab, India. The body, enclosed in a polythene bag, was submitted for medicolegal autopsy. The case was registered under suspicion of female feticide and concealment of birth by secret disposal of the dead body, based on the preliminary investigation (Figure 1a and 1b). The photographic documentation is limited to photographs obtained from police personnel during scene recovery and those taken during the autopsy procedure. The remains were brought for autopsy shortly after recovery, according to the police.



Figure 1: External view of the mutilated female foetus showing pelvis and lower limbs lying in the crime scene (Photographs obtained from police personnel).

External examination showed that the available portion included the lower abdomen, pelvis, and both lower limbs. The overall length of the available portion measured 33 cm, and the weight was approximately 1.2 kg. The foot length was 6.5 cm. The external genitalia were identifiable as female, with well-formed labia majora. The skin showed greenish-black discolouration consistent with decomposition. Rigor mortis has disappeared, and postmortem staining could not be appreciated, also due to advanced decomposition. In the umbilical cord, a remnant measuring 9 cm was torn and crushed at the distal end with irregular margins, without any haemorrhagic infiltration. Individual vessels could not be distinguished. No placenta was attached or recovered from the scene. Other external features indicated that both feet were developed, with toenails extending beyond the toe tips (Figure 2). The anal opening was patent, with meconium staining (Figure 3).



Figure 2: Developed feet on the fetus.



Figure 3: Anal opening with meconium staining (encircled), consistent with intrauterine passage. Additionally, intestines and omentum were seen protruding from the abdominal cavity due to truncation (arrow).

No other evidence of congenital anomalies or gross malformations could be assessed due to decomposition. The truncation of the abdomen showed irregular serrated margins, without any infiltration of blood, and did not show any consistency with an antemortem injury pattern (Figure 4a).



Figure 4: Irregular wound margins at the abdominal base without vital reaction (a) and overall view of decomposed foetal remains at the level of the truncated abdomen (b), highlighting mutilation and challenges in autopsy interpretation.

In the internal examination, the intestines and omentum were seen protruding from the abdominal opening. Internal organs were largely indistinguishable due to advanced decomposition, and no meaningful anatomical delineation could be made as the available organs were converted into a black pultaceous mass (Figure 4a and 4b). The lungs, heart, and part of the liver were missing.

Ossification centres were noted in the talus, distal femur, and proximal tibia bilaterally. The distal femoral ossification centre measured approximately 5 mm in diameter, which further supported an estimated gestational age in the late second to early third trimester. These findings correspond to a gestational age of approximately 28–30 weeks, suggesting that

the foetus had reached the age of viability (Figure 5). The wound margins and the viscera lacked vital reaction, ruling out antemortem injuries and favouring postmortem mutilation. Additionally, available viscera were sent for chemical analysis, which was negative. The femur was handed over to the police for DNA analysis.



Figure 5: Presence of ossification centres in the distal femur and proximal tibia (blue circle) bilaterally.

DISCUSSION

This case highlights the forensic, medico-legal, and societal complexities encountered when examining mutilated and decomposed foetal remains in suspected female feticide. Three principal dilemmas were encountered: determination of live birth, estimation of gestational age and developmental maturity, and differentiation between antemortem trauma and postmortem mutilation.

Determination of live birth was impossible due to the absence of lungs and the advanced decomposition. Classical methods used in forensic practice to establish live birth, including the hydrostatic test, Fodéré's test, Ploucquet's test, and the stomach–bowel test, could not be performed because the relevant organs were missing and the remaining tissues were extensively decomposed. Indirect indicators such as the presence of meconium and the morphology of the umbilical cord were therefore interpreted cautiously and were considered inconclusive markers of live birth, as

well as the possibility of it being a stillbirth. Assessment of vital reaction was performed through careful macroscopic examination of the wound margins, specifically looking for haemorrhagic infiltration, tissue swelling, or inflammatory changes. None of these features was identified in the present case, which supported the interpretation that the injuries were postmortem in nature. Similar limitations in determining live birth in decomposed foetal remains have been described in forensic pathology literature^{3,4}.

Gestational age estimation was done through skeletal examination. Ossification centres were identified in the distal femur, proximal tibia, and talus bilaterally. The appearance of these ossification centres is generally associated with late second to early third trimester foetal development, typically around 28–30 weeks of gestation. These findings, together with the anthropometric measurements obtained during autopsy, suggested that the foetus had reached a gestational age approaching the threshold of potential extrauterine viability rather than confirming viability itself. However, the presence of ossification centres alone cannot establish live birth and must be interpreted in conjunction with other autopsy findings and investigative circumstances. These developmental markers are widely used in forensic pathology to estimate foetal maturity and gestational age^{3–6}.

Histological examination of the umbilical stump may provide additional evidence of vitality by demonstrating inflammatory cell infiltration or vascular changes. However, in the present case, the umbilical cord remnant was markedly decomposed and crushed, rendering the tissue unsuitable for meaningful histopathological evaluation. Similarly, estimation of the postmortem interval was not possible because the remains were incomplete and already in an advanced state of decomposition at the time of recovery, and reliable scene findings were not available.

Recent literature has emphasized the growing role of non-invasive postmortem imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI) in foetal autopsy investigations. These modalities allow

evaluation of skeletal development, identification of ossification centres, and measurement of long bones, thereby assisting in gestational age estimation when conventional autopsy is limited⁷. In the present case, however, postmortem radiological imaging was not performed because such facilities were not available at the forensic unit where the autopsy was conducted. Consequently, gestational age estimation relied on conventional anthropometric measurements and identification of ossification centres during autopsy.

Differentiating antemortem from postmortem injury was another key challenge. The truncation of the abdomen showed irregular serrated margins and lacked haemorrhagic infiltration, favouring postmortem mutilation rather than antemortem trauma. Experimental and observational studies in forensic taphonomy have demonstrated that scavenging animals can produce irregular tearing patterns that may mimic traumatic injuries^{8,9}.

Although the remains were recovered within a plastic bag, environmental exposure may have allowed access to scavenging animals if the bag was damaged, partially open, or degraded over time. Alternatively, animal interference may have occurred before placement of the remains in the bag.

Although forensic entomology may assist in estimating the postmortem interval and reconstructing postmortem events, no insect specimens were collected at the recovery scene; therefore, entomological analysis could not be performed in the present case.

Beyond the technical challenges, the gestational age suggested advanced foetal development, but the cause of death in this case remained inconclusive. This case underscores the broader medico-legal and socio-cultural implications of suspected female feticide. Even when the determination of live birth is impossible, identification of female sex together with evidence of advanced gestational age may raise suspicion of unlawful termination or abandonment. The forensic pathologist's role extends beyond diagnosis to meticulous documentation of both positive and negative

findings, which may support judicial proceedings when direct evidence is lacking^{1,2}. From a public health perspective, this case reflects the persistence of sex-selective practices despite legislative measures such as the Pre-Conception and Pre-Natal Diagnostic Techniques (PC-PNDT) Act. Continued documentation and reporting of such cases may contribute to improved awareness, policy enforcement, and medico-legal understanding of gender-based discrimination.

CONCLUSION

The autopsy of a mutilated, decomposed female foetus demonstrates the limitations of foetal autopsy under adverse conditions. Incorporation of contemporary guidelines, taphonomic interpretation, and advanced imaging may enhance accuracy. This case emphasizes both the technical complexity of foetal autopsies and the moral urgency of preventing sex-selective practices.

LIST OF ABBREVIATIONS

CT – Computed Tomography

IUW – Intrauterine Weeks

MRI – Magnetic Resonance Imaging

PC-PNDT Act – Pre-Conception and Pre-Natal Diagnostic Techniques Act

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None.

CONFLICTS OF INTEREST

The authors declared no conflicts of interest.

ETHICAL ISSUES

The findings of the presented cases were used for academic purposes, maintaining anonymity.

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AUTHOR CONTRIBUTIONS

KP: Conception and design of the work; the acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work

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