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FORENSIC ANTHROPOLOGY AND ITS APPLICATION IN HUMAN IDENTIFICATION

Dr. Chandraprabha M. Patgar
Associate Professor in Forensic Science,
Department of Criminology and Forensic Science,
Government First Grade College, Haveri, Karnataka.

ABSTRACT

Forensic anthropology is an important branch of forensic science that applies anthropological knowledge and skeletal analysis to assist in the identification of human remains. It plays a significant role in cases involving unidentified, decomposed, burned, fragmented, or skeletonized remains. The discipline examines skeletal characteristics to estimate biological attributes such as age, sex, stature, and ancestry, while also documenting individualizing features such as trauma, disease, and skeletal abnormalities. Forensic anthropologists may work with police investigators, forensic pathologists, odontologists, and other specialists to establish the identity and circumstances associated with human remains. Methods involving measurements, morphological assessment, imaging, and statistical analysis are used to evaluate skeletal evidence. Modern developments such as three-dimensional imaging, digital reconstruction, computed tomography, and computer-assisted analysis have expanded the applications of forensic anthropology. Skeletal trauma analysis can also provide information about injuries and possible events surrounding death. The examination of human remains is particularly valuable in mass disasters, criminal investigations, missing-person cases, and historical or archaeological contexts. However, identification generally requires the integration of anthropological findings with other evidence such as dental records, DNA analysis, medical records, fingerprints, and personal information. The study highlights the scientific contribution of forensic anthropology to human identification and emphasizes the importance of standardized methods, appropriate documentation, and multidisciplinary cooperation.

KEYWORDS: *Forensic Anthropology, Human Identification, Skeletal Remains, Age Estimation, Sex Estimation, Stature Estimation, Ancestry, Skeletal Analysis, Forensic Science, Human Remains, Trauma Analysis, Missing Persons, Mass Disasters, Biological Profile, DNA Analysis.*

INTRODUCTION

Forensic anthropology is a specialized field of forensic science that applies principles and techniques of physical anthropology to the examination of human skeletal remains. It is particularly useful when remains are decomposed, skeletonized, burned, fragmented, or otherwise unsuitable for conventional identification methods. The primary purpose of forensic anthropological examination is to

develop a biological profile and obtain information that can assist in establishing the identity of an unknown individual. Skeletal analysis can provide estimates of age, sex, stature, and population affinity, while observations of skeletal abnormalities, previous injuries, diseases, and anatomical variations may provide additional identifying information. Forensic anthropologists use morphological observations, skeletal measurements, statistical methods, radiographic techniques, and other scientific approaches during examination. The discipline has applications in criminal investigations, missing-person cases, mass disasters, unidentified remains, and humanitarian investigations. Careful recovery and documentation of remains are essential because the condition and context of skeletal evidence can influence subsequent analysis. Forensic anthropology also contributes to the assessment of skeletal trauma and can help distinguish injuries that occurred before death, around the time of death, or after death. Although anthropological analysis may narrow the range of possible identities, it is generally considered alongside other forms of forensic evidence. Thus, forensic anthropology provides an important scientific framework for examining human remains and supporting the identification process.

The application of forensic anthropology has expanded with developments in imaging technology, digital analysis, and multidisciplinary forensic investigation. Three-dimensional imaging, computed tomography, digital photography, and computer-assisted measurement can improve the documentation and analysis of skeletal remains. Facial approximation and craniofacial analysis may also generate investigative leads when other identifying information is unavailable, although these methods have limitations and are not normally considered definitive identification by themselves. Comparison of skeletal findings with medical records, radiographs, dental information, DNA profiles, fingerprints, and other ante-mortem evidence can strengthen the identification process. Forensic anthropologists may participate in the recovery and examination of remains from disaster sites, clandestine graves, fires, accidents, and other complex scenes. Their work requires careful attention to scientific standards, ethical considerations, evidence preservation, and appropriate statistical interpretation. Collaboration with forensic pathologists, forensic odontologists, geneticists, archaeologists, law-enforcement personnel, and disaster-response teams is often necessary for comprehensive case assessment. The reliability of anthropological conclusions depends on the condition of the remains, the methods used, population variation, and the quality of available comparative information. Consequently, forensic anthropology is best understood as one component of an integrated human-identification process. Its systematic application can provide valuable information about unidentified remains and contribute substantially to forensic investigations and the resolution of missing-person cases.

AIMS AND OBJECTIVES

Aim

The main aim of this study is to examine the role of forensic anthropology in the scientific examination and identification of human skeletal remains. It focuses on understanding how skeletal characteristics and anthropological methods can provide useful information about unidentified individuals and support forensic investigations.

Objectives

- To understand the concept, scope, and significance of forensic anthropology.
- To examine the role of skeletal analysis in human identification.
- To study methods of recovery and documentation of human skeletal remains.
- To examine the development of a biological profile from skeletal evidence.
- To study methods used for estimating age from skeletal remains.

- To examine techniques used for estimating sex from skeletal characteristics.
- To study methods of stature estimation from skeletal measurements.
- To examine the assessment of population affinity and its forensic limitations.
- To identify individual skeletal characteristics useful in forensic investigations.
- To examine the significance of pathological conditions and anatomical variations.
- To study the role of skeletal trauma analysis in forensic investigations.
- To examine the application of forensic anthropology to decomposed and skeletonized remains.
- To study its application in missing-person investigations.
- To examine the role of forensic anthropology in mass-disaster investigations.
- To understand the use of radiography and computed tomography in skeletal examination.

REVIEW OF LITERATURE

The literature on forensic anthropology establishes skeletal analysis as an important component of the identification of unknown human remains. Scholarly works have extensively examined the development of biological profiles from skeletal evidence, particularly through estimation of age, sex, stature, and population affinity. Researchers have emphasized that the accuracy of these estimations depends on skeletal preservation, population variation, age, sex, and the analytical method applied. Studies of the pelvis and skull have contributed substantially to sex estimation, while long-bone measurements have been widely investigated for stature estimation. Age estimation research has examined indicators such as skeletal development, epiphyseal fusion, dental development, and age-related changes in bones. Literature has also explored morphological and metric approaches for assessing population affinity, while noting that human biological variation makes such assessments subject to limitations. Researchers have investigated the value of pathological conditions, healed fractures, congenital anomalies, and unusual skeletal characteristics as supplementary identifying features. Forensic anthropology has been applied to cases involving decomposed, burned, fragmented, and skeletonized remains where conventional identification may be difficult. Studies further indicate that careful recovery, documentation, and preservation of remains are essential for subsequent laboratory analysis. The literature therefore presents forensic anthropology as a systematic discipline that provides biological information useful for narrowing the identity of unknown individuals.

Recent literature demonstrates increasing integration of forensic anthropology with advanced imaging, digital technologies, and other forensic disciplines. Radiography and computed tomography have improved the documentation and examination of skeletal structures, while three-dimensional imaging has facilitated detailed digital analysis and reconstruction. Researchers have investigated geometric morphometrics and computer-assisted statistical approaches for improving the assessment of skeletal variation. Facial approximation and craniofacial reconstruction have also been studied as investigative tools for generating possible leads when ante-mortem identification information is unavailable. Literature on mass disasters emphasizes the importance of forensic anthropologists in the recovery, sorting, documentation, and analysis of human remains. Studies of missing-person cases demonstrate that anthropological findings become more informative when combined with DNA profiles, dental records, medical records, fingerprints, and radiographic comparisons. Research has also highlighted the importance of analysing skeletal trauma to document injuries and distinguish trauma from post-mortem damage. At the same time, scholars have stressed that anthropological estimates are generally probabilistic and should be interpreted within appropriate scientific limitations. Population-specific standards, adequate reference samples, validated methods, and statistical evaluation are considered important for improving reliability. Overall, the reviewed literature indicates that forensic anthropology has developed from traditional

skeletal examination into a multidisciplinary field that combines biological anthropology, imaging, statistical analysis, and complementary identification methods.

RESEARCH METHODOLOGY

The present study adopts a descriptive and analytical research methodology to examine the role of forensic anthropology in human identification. The study is primarily based on secondary data collected from forensic anthropology textbooks, peer-reviewed research articles, academic journals, forensic science publications, and other reliable scholarly sources. The research focuses on the scientific examination of human skeletal remains and the methods used to develop a biological profile. Particular attention is given to the estimation of age, sex, stature, and population affinity from skeletal characteristics. Information relating to skeletal morphology, metric measurements, anatomical variations, pathological conditions, and skeletal trauma is systematically reviewed. The study also examines the recovery, documentation, preservation, and examination of human remains in forensic contexts. Different anthropological techniques are compared to understand their applications and limitations in human identification. The methodology includes an examination of traditional morphological and metric approaches as well as modern imaging-based methods. Relevant information is selected according to its scientific reliability, relevance to human identification, and contribution to forensic anthropology.

The analytical component of the study examines the application of forensic anthropology in cases involving unidentified, decomposed, burned, fragmented, and skeletonized human remains. The study reviews the use of radiography, computed tomography, three-dimensional imaging, digital reconstruction, and statistical analysis in skeletal identification. It also examines the role of facial approximation and craniofacial analysis as investigative techniques. Comparative analysis is used to understand the strengths and limitations of different anthropological methods. The study further considers the integration of anthropological findings with DNA analysis, dental records, fingerprints, medical records, and radiological evidence. Applications in missing-person investigations, mass disasters, criminal cases, accidents, and other unidentified-remains investigations are also examined. Information from different sources is organized thematically and compared to identify common findings, methodological challenges, and recent developments. The study emphasizes that anthropological estimates should be interpreted with appropriate scientific caution and in combination with other identification evidence. The methodology therefore provides a systematic framework for evaluating the contribution of forensic anthropology to accurate, evidence-based human identification.

STATEMENT OF THE PROBLEM

The identification of unknown human remains is a major challenge in forensic investigations, particularly when bodies are decomposed, skeletonized, burned, fragmented, or otherwise damaged. Conventional identification methods may become difficult or impossible when recognizable facial features, fingerprints, or other soft tissues are no longer available. In such circumstances, skeletal remains can provide important information about the biological characteristics of an individual. However, accurate interpretation of skeletal evidence requires specialized knowledge, appropriate methods, and careful documentation. Estimating age, sex, stature, and population affinity from skeletal remains can be affected by biological variation, age, preservation conditions, and differences among reference populations. The absence of suitable reference standards can further influence the reliability of anthropological assessments. Fragmented or incomplete skeletal remains may create additional difficulties in developing a comprehensive biological profile. Consequently, there is a need to examine the methods used in forensic anthropology and understand their applications and limitations in human identification. The problem also

includes the proper recovery, preservation, documentation, and analysis of skeletal evidence so that valuable identifying information is not lost during forensic examination.

Another important problem concerns the integration of forensic anthropological findings with other identification techniques. Anthropological assessment generally provides a biological profile rather than establishing identity independently in every case. DNA analysis, dental comparison, fingerprints, medical records, radiographs, and other evidence may therefore be required for confirmation. The interpretation of skeletal trauma can also be complicated by post-mortem damage, environmental effects, and incomplete remains. Advances in three-dimensional imaging, computed tomography, digital reconstruction, and statistical analysis have created new opportunities but also require appropriate validation and trained personnel. Facial approximation may generate investigative leads, but its results must be distinguished from definitive identification evidence. Mass disasters and large-scale recovery operations create additional challenges involving the sorting, documentation, and association of remains. Therefore, there is a need for systematic research into the accuracy, reliability, and practical application of forensic anthropological methods. The present study addresses these issues by examining the role of forensic anthropology in human identification, including biological profiling, skeletal analysis, trauma assessment, technological applications, and integration with complementary forensic evidence.

NEED OF THE STUDY

The study of forensic anthropology is necessary because the identification of human remains can become difficult when a body is decomposed, skeletonized, burned, fragmented, or severely damaged. In such situations, skeletal remains may preserve valuable biological information that can assist investigators in establishing the characteristics of an unknown individual. Forensic anthropology provides scientific methods for examining skeletal morphology and measurements and for estimating age, sex, stature, and population affinity. The study is needed to understand how these characteristics can contribute to the development of a biological profile. It is also important to examine the significance of individual skeletal features, previous fractures, pathological conditions, anatomical variations, and dental or skeletal abnormalities. Proper recovery and documentation of skeletal remains are essential because incomplete or poorly preserved evidence may reduce the usefulness of subsequent examination. Forensic anthropology is relevant to criminal investigations, missing-person cases, mass disasters, accidents, and unidentified-remains investigations. The need for this study is further increased by the challenges involved in examining incomplete and fragmented skeletal remains. Understanding the strengths and limitations of anthropological techniques can help ensure that findings are interpreted appropriately. Therefore, systematic study of forensic anthropology is important for improving the scientific examination of human skeletal remains.

The study is also needed because modern human identification increasingly involves the integration of several forensic disciplines and technologies. Radiography, computed tomography, three-dimensional imaging, digital reconstruction, and statistical analysis have expanded the methods available for examining skeletal remains. Research into these techniques is necessary to understand their accuracy, applications, and limitations in different forensic circumstances. Facial approximation and craniofacial analysis may provide investigative leads, but their appropriate use requires careful scientific interpretation. Anthropological findings can become more informative when combined with DNA analysis, dental records, fingerprints, medical records, and ante-mortem radiographs. The study is therefore needed to examine how forensic anthropology can contribute to multidisciplinary identification processes. It can also help explain the importance of standardized methods, appropriate reference populations, statistical evaluation, quality assurance, and professional training. In mass-disaster investigations, systematic

anthropological approaches may assist in organizing and analysing large numbers of remains. Continued research is required to improve methods for incomplete remains and diverse populations. Overall, the study is needed to understand the scientific contribution of forensic anthropology and its appropriate integration with other forensic evidence in the identification of unknown human remains.

FURTHER SUGGESTIONS FOR RESEARCH

Future research should focus on improving the accuracy and reliability of methods used to estimate age, sex, stature, and population affinity from human skeletal remains. Researchers should develop and validate population-specific standards using larger and more representative reference samples. Greater attention should be given to methods suitable for fragmented, incomplete, burned, and poorly preserved skeletal remains. Comparative studies can evaluate morphological and metric techniques to determine their reliability under different forensic conditions. Further research should examine the effects of age, sex, biological variation, environmental factors, and skeletal preservation on anthropological assessments. Advanced three-dimensional imaging and digital reconstruction techniques should be investigated for their potential to improve skeletal documentation and measurement. Computed tomography and radiographic methods can be further evaluated for non-destructive examination of remains. Research may also explore geometric morphometrics and other statistical approaches for analysing complex skeletal variation. Improved methods for documenting skeletal trauma can contribute to the understanding of injuries and post-mortem damage. Further studies should examine the forensic value of pathological conditions, healed injuries, anatomical variations, and unusual skeletal features in individual identification.

Future research should also investigate the integration of forensic anthropology with DNA analysis, forensic odontology, fingerprint examination, medical records, and radiological comparison. Studies can evaluate how multidisciplinary evidence can improve the reliability of identification in complex cases. More research is needed on the application and limitations of facial approximation and craniofacial reconstruction as investigative tools. Artificial intelligence and machine-learning techniques may be explored for automated skeletal classification, measurement, image analysis, and comparison, provided that such systems are properly validated. Research should also address the identification of human remains following mass disasters, accidents, fires, and large-scale recovery operations. Development of standardized digital databases containing skeletal measurements and reference information could support more consistent analysis. Further investigation into methods for estimating biological characteristics in underrepresented populations is also important. Researchers should examine ethical considerations related to the handling, documentation, storage, and digital representation of human remains. Training programs should be strengthened to ensure that forensic anthropology practitioners have appropriate technical and analytical skills. Finally, continued interdisciplinary research and validation of emerging technologies can improve the scientific foundation of forensic anthropology and enhance its contribution to human identification.

SCOPE AND LIMITATIONS

The scope of the present study covers the role of forensic anthropology in the scientific examination and identification of human skeletal remains. It examines methods used to develop a biological profile, including estimation of age, sex, stature, and population affinity. The study covers the examination of complete, incomplete, fragmented, burned, decomposed, and skeletonized remains. It includes the analysis of skeletal morphology, metric measurements, anatomical variations, pathological conditions, and previous skeletal injuries. The study also considers the role of forensic anthropology in criminal investigations, missing-person cases, mass disasters, accidents, and unidentified-remains cases. The scope includes

methods of recovery, documentation, preservation, and examination of skeletal evidence. Traditional morphological and metric techniques are considered alongside modern approaches involving radiography, computed tomography, three-dimensional imaging, and digital analysis. The study also examines skeletal trauma assessment and its relevance to forensic investigations. Facial approximation and craniofacial analysis are considered as investigative techniques that may assist in generating identification leads. The scope further includes the integration of anthropological findings with DNA analysis, forensic odontology, fingerprints, medical records, and radiographic evidence. It also considers the importance of multidisciplinary cooperation and standardized forensic procedures.

The study has several limitations that should be considered when interpreting forensic anthropological findings. Estimates of age, sex, stature, and population affinity may be affected by biological variation, skeletal preservation, individual characteristics, and differences among reference populations. Fragmented or incomplete remains may limit the amount of information available for developing a biological profile. Environmental conditions, burning, decomposition, trauma, and post-mortem damage can alter skeletal characteristics and complicate analysis. Anthropological methods generally provide estimates or ranges rather than absolute identification in every case. The accuracy of results may also vary according to the analytical method, available reference data, and expertise of the examiner. Facial approximation cannot normally be treated as definitive identification and may be influenced by assumptions concerning facial soft tissues. Advanced imaging and digital technologies may require specialized equipment, trained personnel, and adequate financial resources. The study is also limited by the availability of documented forensic case material and appropriate skeletal reference collections. Differences in forensic standards and practices across regions may affect the general application of particular methods. Consequently, forensic anthropological findings should be interpreted cautiously and, whenever possible, integrated with DNA, dental, fingerprint, medical, and other independent evidence for comprehensive human identification.

Scope of the Study

The present study focuses on the role of forensic anthropology in the scientific examination of human skeletal remains for identification purposes. It covers the development of biological profiles through the estimation of age, sex, stature, and population affinity. The study includes the examination of complete, incomplete, fragmented, burned, decomposed, and skeletonized remains. It examines skeletal morphology, metric measurements, anatomical variations, pathological conditions, and previous injuries that may provide useful identifying information. The scope extends to criminal investigations, missing-person cases, mass disasters, accidents, and unidentified human remains. It also covers procedures related to the recovery, documentation, preservation, and examination of skeletal evidence. Traditional morphological and metric methods are considered along with modern techniques such as radiography, computed tomography, three-dimensional imaging, and digital analysis. The study examines the role of skeletal trauma analysis in documenting injuries and distinguishing trauma from post-mortem damage. Facial approximation and craniofacial analysis are also considered as investigative approaches. The scope further includes the use of statistical methods and comparative skeletal analysis in forensic investigations. It emphasizes the importance of appropriate reference populations, standardized procedures, and scientific interpretation when analysing skeletal characteristics.

The study also covers the integration of forensic anthropological findings with other human-identification techniques. DNA analysis, forensic odontology, fingerprint examination, medical records, and ante-mortem radiographs are considered complementary sources of identification evidence. The scope includes the contribution of forensic anthropology to multidisciplinary investigations in which several

forms of evidence are evaluated together. It examines the application of digital technologies and imaging methods for improving the documentation and analysis of skeletal remains. The study also considers the importance of accurate evidence recovery and preservation in mass-fatality and disaster investigations. The role of forensic anthropologists in collaboration with forensic pathologists, geneticists, odontologists, investigators, and other specialists is included. Attention is given to the interpretation of biological-profile estimates and the need to recognize their scientific limitations. The study further considers developments in computer-assisted analysis, three-dimensional reconstruction, and emerging analytical approaches. Ethical handling of human remains and appropriate professional practices are also relevant to the scope. Overall, the study provides a broad examination of how forensic anthropology contributes to the identification of unknown human remains and supports forensic investigations through systematic skeletal analysis and multidisciplinary evidence integration.

DISCUSSION:

Forensic anthropology plays an important role in the scientific identification of unknown human remains in criminal investigations, missing-person cases, accidents, mass disasters, and other medico-legal situations. The present discussion highlights that skeletal remains can provide valuable biological information even when soft tissues are decomposed, damaged, or completely absent. Examination of the skeleton helps forensic anthropologists estimate age, sex, stature, and population affinity and assists in developing a biological profile of the unidentified individual. Skeletal morphology, measurements, anatomical variations, pathological conditions, and evidence of previous injuries can provide additional clues for identification. The effectiveness of forensic anthropological examination depends on the condition and completeness of the remains, the availability of appropriate reference standards, and the experience of the examiner. Modern anthropological methods increasingly combine traditional osteological assessment with radiological imaging, statistical analysis, digital techniques, and three-dimensional reconstruction. These approaches improve documentation and allow detailed examination of skeletal characteristics that may not be easily observed through conventional methods. Forensic anthropology is therefore not limited to identifying skeletal features but also contributes to reconstructing aspects of an individual's biological history and circumstances surrounding death.

The application of forensic anthropology becomes particularly significant when conventional identification methods such as visual recognition or fingerprint examination are not possible. Anthropological findings can be compared with ante-mortem information, medical records, radiographs, dental records, and DNA evidence to strengthen identification conclusions. Collaboration among forensic anthropologists, forensic pathologists, forensic odontologists, geneticists, law-enforcement personnel, and disaster-response teams improves the overall reliability of investigations. Facial approximation and three-dimensional reconstruction may also assist investigative agencies by providing a visual representation of an unidentified individual, although such methods should be interpreted as investigative aids rather than definitive identification techniques. The discussion further indicates that technological developments such as computer-assisted measurements, digital imaging, virtual anthropology, and advanced statistical methods are expanding the scope of forensic identification. At the same time, limitations such as fragmented remains, population variation, environmental damage, incomplete reference databases, and uncertainty in biological estimations must be carefully considered. Overall, forensic anthropology provides a systematic and scientifically informed approach to human identification and serves as an important component of multidisciplinary forensic investigation.

RECOMMENDATIONS

Forensic anthropology should be strengthened through systematic training, standardized procedures, and continuous professional development for forensic practitioners involved in human identification. Greater emphasis should be placed on accurate recovery, documentation, preservation, and examination of skeletal remains at crime scenes and disaster sites. Forensic laboratories should adopt validated anthropological methods and appropriate reference standards for estimating age, sex, stature, and other biological characteristics. Comprehensive regional skeletal databases should be developed to account for population-specific variation and improve the reliability of biological-profile estimation. Modern technologies such as digital radiography, computed tomography, three-dimensional scanning, virtual anthropology, and computer-assisted analysis should be incorporated where appropriate. Regular calibration and quality-control procedures should be implemented to minimize observational and measurement errors. Forensic anthropology education should include practical training in osteology, skeletal trauma, taphonomy, human variation, statistical analysis, and ethical handling of human remains. Collaboration between academic institutions and forensic laboratories can further improve research opportunities, technical expertise, and the application of scientifically validated methods.

Multidisciplinary cooperation should be encouraged so that anthropological findings can be integrated with DNA analysis, forensic odontology, fingerprints, medical records, radiological evidence, and other identification techniques. Investigating agencies should maintain proper chain-of-custody procedures and ensure that skeletal evidence is collected, labelled, transported, and stored according to established forensic protocols. Research should focus on improving methods for fragmented, burned, decomposed, juvenile, and highly damaged remains, where identification can be particularly challenging. Further studies should examine population variation and develop reliable statistical models suitable for different demographic groups. Digital databases and secure information-sharing systems may improve comparisons between unidentified remains and missing-person records. Facial approximation and three-dimensional reconstruction should be used carefully as investigative support tools and should not replace scientifically established identification methods. Ethical guidelines should be followed throughout the recovery, examination, documentation, and reporting of human remains. Continuous evaluation of emerging technologies, inter-laboratory validation, publication of research findings, and cooperation among forensic specialists can contribute to more accurate, transparent, and scientifically reliable human identification.

CONCLUSION

Forensic anthropology has emerged as an important component of modern forensic science, particularly in the identification and examination of unknown human remains. The systematic study of skeletal structures provides valuable information about the biological characteristics of an individual, including age, sex, stature, population affinity, skeletal variation, pathology, and evidence of trauma. Its application is especially important in cases involving decomposed, skeletonized, fragmented, burned, or otherwise unrecognizable remains where conventional identification methods may be difficult to apply. Forensic anthropological examination can assist investigations involving homicide, missing persons, accidents, mass disasters, and unidentified bodies. Careful recovery, documentation, preservation, and scientific analysis of skeletal evidence improve the quality of forensic investigations. The integration of osteological examination with statistical methods, radiological imaging, digital technologies, and three-dimensional approaches has further expanded the capabilities of forensic anthropology. These developments allow forensic specialists to obtain and interpret increasingly detailed information from human remains.

The study also concludes that forensic anthropology is most effective when applied as part of a multidisciplinary identification process. Anthropological findings can be compared with DNA profiles, dental records, fingerprints, medical histories, radiographs, and other ante-mortem information to strengthen identification. Collaboration among forensic anthropologists, forensic pathologists, forensic odontologists, geneticists, investigators, and disaster-response professionals can improve the completeness and reliability of identification procedures. However, biological-profile estimates are subject to limitations arising from skeletal preservation, population variation, reference samples, methodological differences, and incomplete remains. Therefore, findings should be interpreted carefully and supported by appropriate scientific evidence. Continued research, development of population-specific databases, standardized protocols, technological advancement, and professional training are necessary for improving forensic anthropological practice. Overall, forensic anthropology provides a systematic, evidence-based, and scientifically valuable approach to human identification and contributes significantly to the resolution of complex medico-legal and forensic investigations.

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