Review Article

Scope of CADAVIZ in Training for Forensic Odontology, Anthropology and Radiology as an Adjunct Tool

[1]C.S. Ramesh Babu, [2]Cherian Kurian, [3]Santhosh UG, [4]Debashree Das, [5]Trupti Kad

[1]Anatomist, Muzaffarnagar Medical College, Muzzaffarnagar, Uttar Pradesh, India, [2]Associate Professor, Department of Forensic Medicine and Toxicology, MGM Vashi, Navi Mumbai, [3]Clinical Radiology Technologist, ImmersiveVision Technology Pvt. Ltd., Pune, India, [4]Medical Research, ImmersiveVision Technology Pvt. Ltd., Pune, India, [5]Senior Medical Research, ImmersiveVision Technology Pvt. Ltd., Pune, India

How to cite this article: C.S. Ramesh Babu, Cherian Kurian, Santhosh UG, Debashree Das, Trupti Kad. Scope of CADAVIZ in Training for Forensic Odontology, Anthropology and Radiology as an Adjunct Tool. Indian Journal of Forensic Medicine & Toxicology / Vol 20 No. 1, January - March 2026

Introduction

Forensic sciences train potential scientists for collection, handling and analysis of evidence, supporting investigations in order to solve crimes and maintain law. It is a broad field encompassing psychology, law, statistics, crime scene management, forensic evidences, fingerprints, forensic biology, anthropology, narcotic drugs, forensic ballistics, forensic chemistry, forensic serology, DNA profiling, forensic medicine, toxicology, digital forensics, cyber forensics, forensic pharmacology, pharmaceutical drug analysis, genomics, immunology, proteomics, audio-video analysis, biometrics, etc. Of these, forensic odontology, radiography, imaging and skeletal analysis of bodies covers a heterogenous group of forensic medicine. The application of diagnostic odontology, imaging, radiology, & anthropology, has been employed in the identification and verification of individuals from skeletal remains and decomposed bodies. A forensic autopsy is conducted to address this objective. An autopsy is done in case of any unnatural deaths, suspicious deaths or unexpected deaths as part of the investigation process.[1]

Forensic students require hands-on training on cadavers, to learn the conventional form of autopsy. This autopsy includes training in techniques such as external examination of the body, different types of incisions e.g., *I-shaped incision*, *Y-shaped*, *modified Y-shaped*, *X-shaped incision*, coronal incision for cranial cavity, opening up the thoracic and abdominal cavities, Technique of Virchow (organs removal), Technique of Rokitansky (in-situ dissection of organs), Technique of Ghon (cervical and thoracic organs, organs in the abdomen, and the urogenital system removal as separate organ blocks), Technique of Letulle (removal of the cervical, thoracic and abdominal organs as a single organ block) and other ancillary investigations crucial in forensic education.[1]

Training on cadavers for students of the forensic science program is posed with hassles, given the limited cadaver availability, cost of such training in medical schools, cost of acquiring, maintaining and treating cadavers, and difficulty to revisit completed dissections due to damaged structures, it has become common practice especially after COVID-19 pandemic to study using virtual teaching methods.[2,3]

Corresponding Author: Trupti Kad, Senior Medical Research, ImmersiveVision Technology Pvt. Ltd., Pune, India.

E-mail: truptishinde199@gmail.com

Submission: Jul 9, 2025 **Revision:** September 4, 2025 **Published date:** January 29,2026

Conventional autopsy too faced challenges of body preservation after post mortem, difficulty in acquiring data from decomposed bodies, the risk of infection or exposure to toxins, obtaining data from inaccessible body parts, data acquisition without hurting religious sentiments or ethics, unbiased documentation of evidence, etc. In order to overcome these problems exhibited by conventional autopsy and so as to not default from the objectivity of a post-mortem, a virtual form of autopsy was introduced. Virtual autopsy project or VIRTOPSY was initiated at the Institute of Forensic Medicine and of Diagnostic Radiology of the University of Bern, Switzerland by Dr. Richard Dirnhofer.[4]This was built with the objective to integrate postmortem CT scans (PMCT), postmortem magnetic resonance imaging (PMMR) and image guided biopsies into forensic pathology investigations.[4,5] It has been proposed that, virtually conducted autopsy procedure, will not only aid in quicker, precise and objective documentation, but it will also facilitate in quality control through digital data transfer and archiving. Virtual autopsy is a non-invasive autopsy, which uses digitalized environment for whole body imaging. The use of forensic radiological facilities as compared to traditional autopsy could reduce the danger of infection to the medical staff especially during pandemics such as COVID-19, H1N1 Flu and epidemics like Ebola, tuberculosis etc.[6,7]

Computed tomography (CT) has been used in forensics since the 1970s.[8] Subsequently, modern imaging technologies such as 3D photogrammetry and surface scanning were incorporated[9]along with CT angiography (CTA), magnetic resonance (MR), sonography, ultrasound, ultrasonography, surface scanning, and in recent times, multi detector computed tomography (MDCT) which provides full body multiplanar advanced images.[10,11,12] With the digitalization of imaging modalities, 'virtual autopsy' has become standard practice across many institutes worldwide.[13] This technology can help students train on planning the autopsy process for a more focused approach. It can allow for a wide range of information such as injuries, fractures, physical conditions that can be easily missed by traditional autopsies. The 3D reconstructions could help in understanding the nature of trauma and extent of injuries caused by it. A library of cases can be created and used to train students of trauma cases, to help students identifying bone fractures, ballistic trauma, reconstructing medicolegal cases, gunshot trajectories in ballistics cases, in hospital deaths, helping to determine cause of death and identify potential medical errors.[14, 15] This technology can help plan the autopsy process for a more focused and efficient investigation.

CADAVIZ[16], whichis worlds' most advancedvirtual human dissection table, can serve dual purpose here. It is a cutting-edge device featuring an 89″electronic table with an ultra-wide intuitive touchscreen, with multiple and simultaneous touch points.It is a pedagogic tool providing a full-scale digital depiction of the human body, enabling observation, manipulation, and virtual dissection of 3D models with detailed anatomical components. Users can navigate through different systems with the help of the visibility menu. The visibility slider enables users to explore life size cadaver dissection, layer by layer for complete understanding. It has an extensive collection of radiology scans and a DICOM viewer (Digital Imaging and Communications in Medicine viewer), enabling users to visualize case data from CT (computed tomography), MRI (magnetic resonance imaging), X-ray, and other imaging modalities and perform comparative studies, when required, to interpret medical images of patients retrieved from the PACS (Picture Archiving and Communication System). It can be used in the study of diagnosis of a variety of conditions. Previous postmortem cases can be uploaded to the system, including data from Virtopsy to present scenarios to students to build on their observational and deductive skills. CADAVIZ is compatible with the available medical imaging data files. These image files can be converted into 3D models for better visualization and be used as a review system for such data both for teaching and diagnosis. CADAVIZ could aid in the learning process of forensic sciences, utilizing 3D reconstructions from CT scan data or other DICOM data.

Aims And Objectives:

1. To understand and review the utilities of CADAVIZ™ instrument in the education and training of forensic medicine students, namely in forensic odontology, anthropology and radiology.

Material and Methods

1. CADAVIZ™ table, Guidelines and manuals of CADAVIZ™ version V1.1.5 (Manual &Notes).[17,18,19]
2. Detailed literature search was performed in Google Scholar, PubMed, and SCOPUS. The search terms virtual autopsy, radiology in forensics, forensic dental data for identification, anthropological data and post mortem were used.

Discussion

CADAVIZ: Use in forensic medicine training to identify individuals from human remains

In spite of the recent technological advances in radiology and forensic imaging, radiology has been a part of forensic sciences since its inception.[20]Radiology modalities are also used in archaeology and anthropology[20]; the increasing demand for the development of accurate and non-invasive methods has led to the evolution of this field.[21] We describe the use of CADAVIZ in the field of forensic odontology, anthropology and radiology, where we make use of radiological data uploaded to CADAVIZ in the form of scans and 3D models.

Forensic Odontology

Dental structures have long been of key importance as the proof of identity in mass fatalities both in natural and man-made disasters. Lack of extensive fingerprint data makes dental identification vitally important. Teeth are strong, durable and resistant to external impacts e.g., fire, explosion, chemicals etc. and hence make them ideal for a postmortem. Teeth can be used to identify the age of an individual, based on factors such as attrition, periodontal disease, secondary dentine formation, and root translucency, resorption of roots, root roughness, apposition of cementum, color change in the crown and the roots which are noticeable with increasing age.[22] Dental restorations can indicate the socio-economic status of an individual. The wear and stain pattern can be an indicator of work or personal habits like smoking etc.[23] Tooth crown morphology can be used in race identification. Anthropologists and odontologists in France and Germany have demonstrated that the number of cuspids of molars differ between the main human races, namely Caucasian, Mongolian and Negroid population. Thus, helping in raceidentification.[24]

A forensic odontology training program requires students to have a practical training component so as to develop a methodological approach in age estimation, bite mark analysis, and dental identification (Image 1). This education relies on hands-on training including head dissections, dental autopsies, exercises on cadavers, on which various dissections are performed, and radiographs.[25] Training on cadavers may be challenging for most dentists, here CADAVIZ could provide with a sustainable learning option for students, doctors and pathologists of forensic sciences. Post-mortem dental and radiological data could be collected and analysed on CADAVIZ. The CT scans could be utilized in 3D reconstructions of the head region, allowing to accurately visualize and analyse with high resolution, the skull, jaws &teeth to identify the reference points for critical measurements. It will also help students to familiarize themselves with the images to understand the basics of standardized collection of dental autoptic parameters.[26]

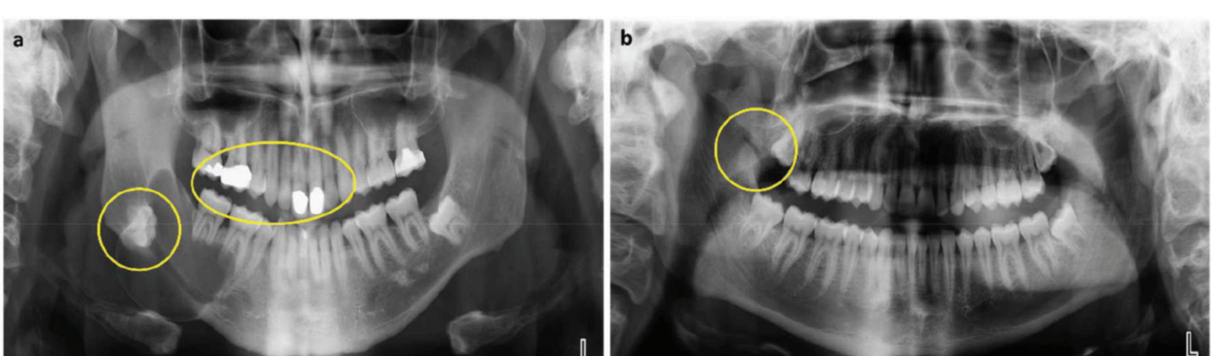

Image1: Radiograph of OPG **(a)** OPG of male patient, showing dental fillings, unerupted molar teeth; **(b)** Male,20 with history of trauma with displaced fracture of the right coronoid process

With the help of 3D reconstructed images on the table, students can visualize the process of dental autopsy, mainly the jaw and teeth. The image can be rotated, zoomed in or out (in proportion) and dissected using arbitrary clipping method. Soft tissues can be hid so as to expose the jaw. Jaws can be dissected to allow detailed visualization of any anomalies, periapical pathologies, dental treatments, analyse missing teeth and alveoli, crown morphologies and dental treatments.[27] With multiplanar reformatting (MPR) function abnormalities at different planes can be located. The multiple presets setting would help to isolate bones, muscles, circulation etc., thereby locating deformities. The table allows to take screenshots of the observed area, which could facilitate the documentation of the case under study.

Forensic Anthropology

Forensic osteometry uses measurements of bones to identify details such as the sex, stature, age, population affinity etc. Bone growth and fusion patterns are specific to different agegroups, the pelvic and cranial structures exhibit gender specific differences, long bones are used in height determination, specific dental and cranial features aid in the estimation of ancestry of individuals.[28,29] Axial skeletons, appendicular skeletons, skull, pelvis and teeth measurements are used for this purpose. The application of osteoma (try for human identification is an important element in the field of forensic sciences.[30] Measurement of dry bones is done by validated instruments such as vernier caliper or osteometric board. Researchers have established landmarks on the bones for the purpose of human identification.[31]

Researchers have used these tools to measure dry bones, however using dry bonesencounters problems; method of bones conservation may be inadequateand this could lead to bone deterioration, wear or alteration of its taphonomicaspects.[32] With time, digital tools have been implemented in forensic anthropology, for identification, forsuperimposition of images, for 3D reconstructions and these tools use diagnostic imaging modalities to obtain more detailed information than that obtained from a dry bone. These images representing the bonescan be stored in centralized databases encouraging multidisciplinary work. The images could be analysed by different software programs to aid in the development of a forensic test method.[33,34] The 3D format would allow students, for macroscopic and morphometric examination, analysing the structure of the bones to facilitate identification of individuals.[30] This application of 3D virtual models within forensic anthropology has led to the new sub-field known as 'virtual anthropology'.[35]

Forensic Radiology

Forensic radiology uses radiological medical imaging techniques to assists pathologists. In this the soft tissues, abdominal viscera, thoracic viscera and osseous skeleton are the prime areas for evaluation.[36] Examination of the osseous skeleton is the key for radiological evaluation. Since long, forensic radiology has been employed for the identification of humans especially in mass disasters and decomposed bodies, in the evaluation of injury and cause of death either accidental or non-accidental, in criminal investigations; in education and research etc[36]. Accidental or inflicted injury can be distinguished by identifying the type of fracture, for e.g., in skull injury, the direction and configuration of the fractures can help determine the impact point, direction, sequence of repetitive blows, shape of the weapon used. Similarly, strangulation, blunt trauma, hanging, etc, is identified by the hyoid bone fractures (Image 2). Other traumas such as intracranial haemorrhage, penetrating wounds, vascular system injuries, etc, can be revealed using contrast media used in CTA.[37]

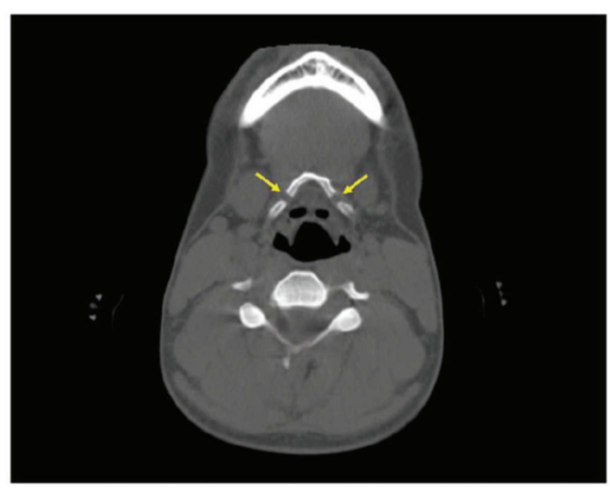

Image 2: Male, 17 with hyoid bone (right cornu) fracture (football tackle)

CT, is mainly used in cases of unnatural deaths related to gunshot injuries and trauma while, MR is used primarily in natural cases related to diseases of the cardiovascular or central nervous system. However, CT is superior to autopsy in the documentation and visualization of skeletal injuries.[38]The scans obtained from these imaging modalities are available in the DICOM format which can be reconstructed into 3D models. The 3D models can aid in the detection of bone structure, identifying the weapon in case of penetrating wounds (internal haemorrhage), or tracking the direction and extension of the wound[9](Image 3 & 4). The CADAVIZ table is enabled to be viewed with radiology mode and anatomy mode simultaneously on 2 screens. In this module, general and pathological comparisons can be made on two screens placed side by side,at the same time. The multiple presets setting helps to isolate bones, muscles, circulation etc., thereby locating deformities.With multiplanar reformatting (MPR) function user can locate abnormalities at different planes. Adjustment of contrast with quality/shift & shade settings guides for a better view of images. It is equipped with integrated 3D volume rendering tools for high quality 3D visualization and navigation through personalized data and anatomical structures.

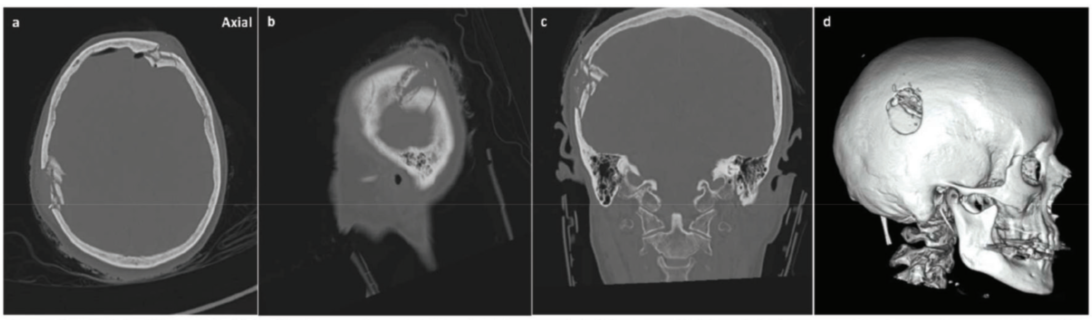

Image 3: (a)(b)(c) - CT scan of a Male, 80 with comminuted, right parietal depressed skull fracture, with internal displacement of the fracture fragments (d) 3D 3D model of the CT image
Source:
Di Muzio B, Depressed skull fractures (hammer). Case study, Radiopaedia.org (Accessed on 24 Apr 2025)

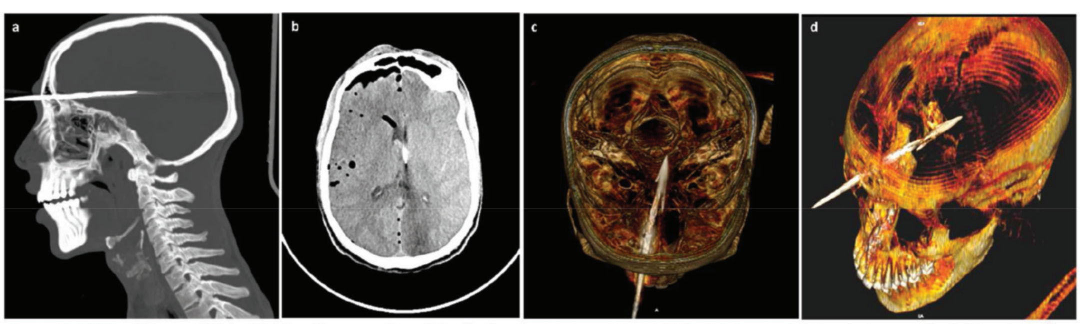

Image 4: (a)(b) – CT scan of Male, 35 Injured by arrow through the forehead, arrow penetrates right frontal sinus and tip terminates near the left basal ganglia. Pneumocephalus and air within the ventricles **(c)(d)** - 3D model of the CT image for better visualization.
Source:
Hartung M, Arrow injury to the brain. Case study, Radiopaedia.org (Accessed on 23 Apr 2025) https://doi.org/10.53347/rID-72101

The digital images can be stored and reviewed again for practice. Thus, training the pathologist to interpret with superior objectivity reducing inconsistencies and biases. This virtual autopsy training method is reproducible and revisitable.

This review does not include comparative studies evaluating the outcomes of CADAVIZ versus cadaver training in the field of forensics. However, similar feedback studies involving MBBS and BAMS students have been previously reported in the subjects of anatomy and dissections [39, 40].

Additionally, a comparative study on teaching MBBS students using CADAVIZ and cadavers is currently under publication.[41] All of these studies positively conclude that while traditional cadaveric dissection is an essential tool for learning human anatomy, combining it with a virtual dissection table provides the best understanding.

Results and Conclusion: Adjuvant to autopsy training

In this paper we refer to examples of blunt force trauma to identify the weapon used, the impact of arrow injury to the head.[42, 43] how dental structures and bone structure analysis can be used to identify individuals especially in mass fatalities.

The CADAVIZ table enables for the conversion and observation of CT scan images into detailed 3D reconstructions (Image 5). These digital images can help train students to identify key findings in an autopsy. We can repeat the training innumerable times, helping in enhancing student assimilation. It eliminates the need for cadavers and is cost effective. CADAVIZ reduces the risk of exposure for trainee students/pathologists doctors, to infection and hazardous chemicals from cadavers/dead bodies.

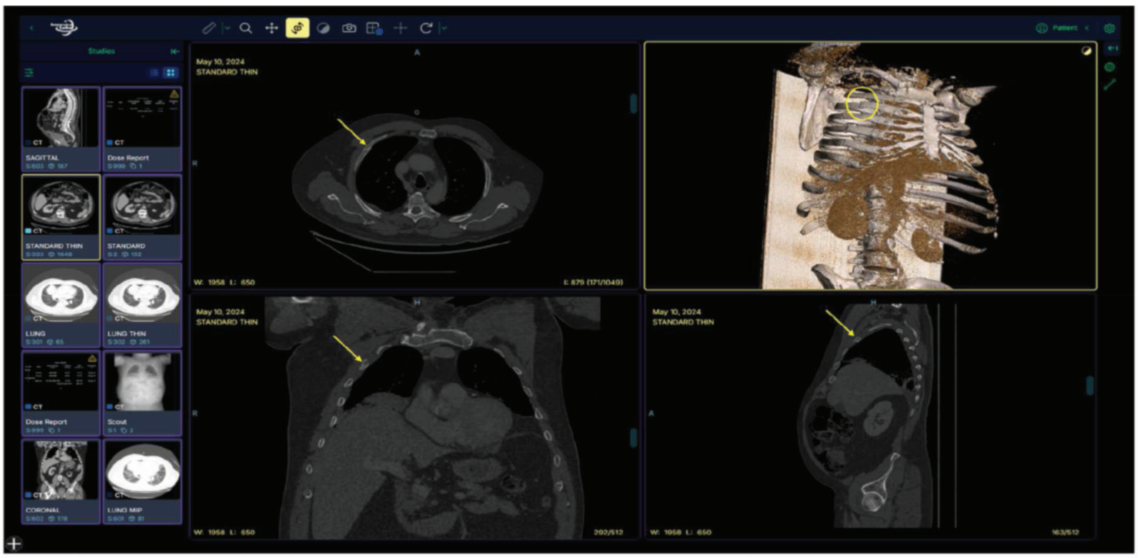

Image 5: CT abdomen and pelvis (trauma), with and without contrast images demonstrating a mildly displaced fracture of the second rib, laterally as seen on CADAVIZ

This imaging technique could help to identify findings that may not be easily identifiable through traditional dissection methods e.g., bony lesions, intra-abdominal lesions, foreign bodies, air embolisms, gross soft tissue abnormalities etc. Since forensic imaging is a non-invasive technique, the bodies are preserved in "as is" state of the body.[44]Hence, we propose that CADAVIZ could be used as an adjunct tool in the training for forensic science graduates.

Funding Sources if Applicable: NA

Ethical Clearance/Statement of Ethics: NA

Declaration of Conflicts of Interest Statement: NA

References

1. Menezes RG, Monteiro FN. Forensic Autopsy. 2023; In: StatPearls. https://www.ncbi.nlm.nih.gov/books/NBK539901.
2. Yammine K, Violato C. A meta-analysis of the educational effectiveness of three-dimensional visualization technologies in teaching anatomy. Anat Sci Educ. 2015;8 (6):525–38. DOI: 10.1002/ase.1510
3. Chytas D, Salmas M, Demesticha T, Noussios G, Paraskevas G, Chrysanthou C, Asouhidou I, Katsourakis A, Fiska A. A review of the use of virtual reality for teaching radiology in conjunction with anatomy. Cureus 2021;13(12): e20174. DOI: 10.7759/cureus.20174
4. Thali MJ, Jackowski C, Oesterhelweg L,Ross SG, Dirnhofer R. VIRTOPSY – the Swiss virtual autopsy approach, Leg. Med. 2007;9(2):100–104, https://doi.org/10.1016/j.legalmed.2006.11.011
5. M. Thali, R. Dirnhofer, P. Vock, The Virtopsy Approach, CRC Press, 2009, https://doi.org/10.1201/9780849381898
6. P. Laskar, M.M. Yallapu, S.C. Chauhan, "Tomorrow Never Dies": recent advances in diagnosis, treatment, and prevention modalities against coronavirus (COVID-19) amid controversies, Diseases. 2020; 8(3):30.https://doi.org/10.3390/diseases8030030
7. M.A. Ellul, L. Benjamin, B. Singh, S. Lant, B.D. Michael, A. Easton, R. Kneen, S. Defres, J. Sejvar, T. Solomon, Neurological associations of COVID-19, Lancet Neurol.2020;19(9): 767–783.https://doi.org/10.1016/S1474-4422(20)30221-0
8. Wullenweber R, Schneider V, Grumme T. A computer-tomographical examination of cranial bullet wounds (author's transl), [Article in German] Z Rechtsmed. 1977;80(3): 227–246. DOI: 10.1007/BF02114619
9. Baglivo M, Winklhofer, S, Hatch, GM,Ampanozi, G, Thali, MJ and Ruder, TD. The rise of forensic and

postmortem radiology—analysis of the literature between the year 2000 and 2011. J Forensic Radiol Imag. 2013;1(1):3–9. DOI: https://doi.org/10.1016/j.jofri.2012.10.003

10. Guglielmi G, Nasuto M and Pinto A. Forensicand medico-legal radiology: challenges, issues and new perspectives. Radiol. Med. 2015;120:777–778.DOI: https://doi.org/10.1007/s11547-015-0567-4
11. Dedouit F, Savall F, Mokrane FZ, Rousseau H,Crubezy E, Rouge D, et al. Virtual anthropology and forensic identification using multidetector CT. Br J Radiol. 2014; 87: 20130468. DOI: 10.1259/bjr.20130468
12. Dedouit, F, Guglielmi, G, Perilli, G, Nasuto, M,Telmon, N, Fineschi, V and Pomara, C. Virtual anthropological study of the skeletal remains of San Fortunato (Italy, third century AD) with multislice computed tomography. JOFRI. 2014;2:9–16. DOI: https://doi.org/10.1016/j.jofri.2013.11.006
13. Rutty GN, Morgan B, O'Donnell C, Leth PM, Thali M. Forensic institutes across the world place CT or MRI scanners or both into their mortuaries, Journal of Trauma 65, 2008;493–494.DOI: 10.1097/TA.0b013e31817de420
14. Shenton A, Kralt P, Suvarna SK. Death, Post mortem changes and decomposition on post mortem computed tomography. Book: Post mortem CT for non-suspicious adult death. 1. Cham, Switzerland: Springer Cham; 2021. pp. 56–57.DOI:10.1007/978-3-030-70829-0_3
15. Shenton A, Kralt P, Suvarna SK, et al. External findings, tubes and devices on post mortem computed tomography. Book: Post mortem CT for non-suspicious adult death. 1. Cham, Switzerland: Springer Cham; 2021. pp. 72–75.DOI:10.1007/978-3-030-70829-0_4
16. Virtual Human Dissection Table Brochure CADAVIZ., 2025,https://immersivelabz.com/cadaviz/
17. CADAVIZ Handling Guidelines.
18. CADAVIZ User Manual Version 1.6 Last Updated: 21 March 2024.
19. CADAVIZ Table v1.0.2 Release Notes date: 02-05-2024.
20. Patyal S., Pandey T., Forensic radiology: A spotlight on India's current trend and Future prospects, Forensic Imaging, Volume 34, 2023, 200561, ISSN 2666-2256, https://doi.org/10.1016/j.fri.2023.200561
21. A. Brough, G. Rutty, C. Villa, K. Colman, F. Dedouit, S. Decker, The benefits of medical imaging and 3D modelling to the field of forensic anthropology positional statement of the members of the forensic anthropology working group of the International Society of Forensic Radiology and Imaging, J. Forensic Radiol. Imaging. 18 (2019) 18–19, DOI:10.1016/j.jofri.2019.07.003
22. Mohammed F, Fairozekhan AT, Bhat S, et al. Forensic Odontology. 2023; In: StatPearls,https://www.ncbi.nlm.nih.gov/books/NBK540984/
23. Kruger MM, Martin LJ, Maistry S, Heathfield LJ. A systematic review exploring the relationship between infection and sudden unexpected death between 2000 and 2016: A forensic perspective. Forensic Sci Int. 2018;289:108-119. DOI: 10.1016/j.forsciint.2018.05.023
24. Someda H, Gakuhari T, Akai J, Araki Y, Kodera T, Tsumatori G, Kobayashi Y, Matsunaga S, Abe S, Hashimoto M, Saito M, Yoneda M, Ishida H. Trial application of oxygen and carbon isotope analysis in tooth enamel for identification of past-war victims for discriminating between Japanese and US soldiers. Forensic Sci Int. 2016;261:166.e1-5. DOI: 10.1016/j.forsciint.2016.02.010
25. Stoeckel D, Stoeckel M, McGivney P, McGivney J. Forensic dental training in the dental school curriculum. J Forensic Sci 2007;52:684–6. DOI: 10.1111/j.1556-4029.2007.00409.x
26. Ward TM, Wertz CI, Mickelsen W. Anatomage table enhances radiologic technology education. RadiolTechnol 2018;89(3):304–6.Erratum in: Radiol Technol. 2018 May;89(5):428-430. PMID: 29298946
27. Cali C, & Nuzzolese E. The use of the Anatomage Table for improving forensic odontology education and training. Annals of 3D Printed Medicine, Volume 7, 2022,100073,ISSN 2666-9641. https://doi.org/10.1016/j.stlm.2022.100073
28. Dunning H. Analysing the bones: what can a skeleton tell you. Natural History Museum, https://www.nhm.ac.uk/discover/analysing-the-bones-what-can-a-skeleton-tell-you.html
29. Tarantino F, Buongiorno L, Luca BP, Stellacci A, Landro MD, Sebastiani GV, Cazzato G, Baldassarra SL, Nuzzolese E, Marrone M. Identification of Skeletal Remains Using Genetic Profiling: A Case Linking Italy and Poland. Genes (Basel). 2023; 3;14(1):134. https://doi.org/10.3390/genes14010134
30. Gaya-SanchoB, Sanjuan-Sánchez D, Ráfales-Perucha A,Zaurín-Paniagua L, Sáez-Gutiérrez B & Galarreta-Aperte S. Comparison of measurements made on dry bone and digital measurements in Anatomage for the sacral bone in a Spanish population. Sci Rep 13, 20578 (2023). https://doi.org/10.1038/s41598-023-48013-8

31. Bookstein, F. Morphometric Tools for Landmark Data (Cambridge University Press, 1997).

32. Caruso V, Cummaudo M, Maderna E, Cappella A, Caudullo G, Scarpulla V, Cattaneo C. A comparative analysis of microscopic alterations in modern and ancient undecalcified and decalcified dry bones. Am. J. Phys. Anthropol.2018; 165, 363–369.DOI: 10.1002/ajpa.23348

33. Davy-Jow SL, Lees DMB & Russell S. Virtual forensic anthropology: Novel applications of anthropometry and technologyin a child death case. Forensic Sci. Int. 2013; 224, e7.DOI: 10.1016/j.forsciint.2012.11.002

34. Sorrentino R, Belcastro MG, Figus C, Stephens NB, Turley K, Harcourt-Smith W, Ryan TM, Benazzi S. Exploring sexual dimorphism of the modern human talus through geometric morphometric methods. PLOS One 15, e0225955, 2020.https://doi.org/10.1371/journal.pone.0229255

35. PattamapaspongN, Kanthawang T, Singsuwan P, Sansiri W, Prasitwattanaseree S, Mahakkanukrauh P. Efficacy of three-dimensional cinematic rendering computed tomography images in visualizing features related to age estimation in pelvic bones. Forensic Science International. 2019; 294(48-56). DOI: 10.1016/j.forsciint.2018.10.003

36. Clemente MA, La Tegola L, Mattera M and Guglielmi G. Forensic Radiology: An Update. Journal of the Belgian Society of Radiology, 2017; 101(S2): 21(1–4). DOI: 10.5334/jbr-btr.1420

37. Brogdon BG. The scope of forensic radiology. ClinLab Med. 1998;18(2): 203–40. Review. DOI: 10.1201/9781420048339.ch3

38. Thali MJ, Yen K, Schweitzer W, Vock P, Boesch C, Ozdoba C, Schroth G, Ith M, Sonnenschein M, Doernhoefer T, Scheurer E, Plattner T, Dirnhofer R. Virtopsy, a new imaging horizon in forensic pathology: virtual autopsy by postmortem multislice computed tomography (MSCT) and magnetic resonance imaging (MRI)—a feasibility study. J Forensic Sci. 2003 Mar;48(2):386-403. PMID: 12665000.

39. Khodke P, Gaddewar R, Satpute C, Ramteke M. Cadaveric dissection versus Virtual Dissection table-Perspective of First year MBBS students IJLBPR. 2025;14(4). DOI: 10.69605/ijlbpr_14.4.2025.21.

40. Relekar AS, Kulkarni SP, Sayyad MR, Yadav PL, Patil PM, Kad TD. Student feedback on CADAVIZ: Evidence of effective anatomy learning. J Ayurved Homeopath Allied Health Sci 2024;3(41):5. DOI: 10.4103/jahas.jahas_14_25.

41. Rajan R et al.Exploring the Effectiveness of CADAVIZ™ in Enhancing Learning Outcomes in Undergraduate Medical Students (Under Publication).

42. Di Muzio B, Depressed skull fractures (hammer). Case study, 2017: Radiopaedia.org https://doi.org/10.53347/rID-54850

43. Hartung M, Arrow injury to the brain. Case study, 2019; Radiopaedia.org https://doi.org/10.53347/rID-72101

44. Bolliger SA, Thali MJ. Imaging and virtual autopsy: looking back and forward. Philo. Trans. R. Soc. B. Biol Sci. 2015;370(1674):20140253. https://doi.org/10.1098/rstb.2014.0253