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LETTER TO THE EDITOR

Legalizing Virtopsy: A Vital Alternative to Conventional Autopsy for Medico-Legal Organ Donation Cases

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Virtopsy, a term combining 'virtual' and 'autopsy,' employs imaging techniques commonly used in clinical medicine, such as computed tomography (CT) and magnetic resonance imaging (MRI), to ascertain the cause of death. This method, also referred to as digital autopsy by some forensic pathologists, serves as an alternative to traditional autopsies. It offers a thorough and systematic examination of the entire body, is less time-consuming, improves diagnostic accuracy, and respects religious sensitivities. Essentially, it involves the application of imaging methods combined with 3D conversion and photogrammetry to achieve the objectives of a medico-legal autopsy [1].

During the 1990s, Richard Dirrhöfer, former head of the Department of Forensic Medicine at the University of Bern in Switzerland, initiated the virtopsy project to document the human body in an objective manner during medico-legal autopsies. In 2003, the British Museum approached his team to conduct an autopsy on a 3000-year-old mummy named Nesperennub without compromising the body. Since then, this technique has been adopted by many countries and is considered a supplementary tool for autopsies, offering a variable degree of certainty [2].

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In 2019, the then Union Health Minister Dr. Harsha Vardhan, mentioned in the parliament of India about the government's intention to introduce virtual autopsy, or virtopsy at AIIMS, Delhi. The project was officially launched at AIIMS Delhi during the second wave of COVID-19 in 2020. A comparator study was conducted, involving both traditional and virtual autopsies in hundreds of cases. This study validated and standardized the virtopsy technique, proving it to be a significant humanitarian relief by ensuring dignified management of the deceased. Notably, the postmortem of celebrity comedian Raju Srivastava was conducted using virtopsy, and these reports are now commonly accepted by courts, similar to conventional autopsy reports [3].

Although virtopsy is not a novel concept in forensic pathology, its routine implementation in our country remains elusive due to several challenges. High initial costs and the reluctance of rigid judicial and law enforcement agencies have hindered its adoption. Even in some of the most advanced jurisdictions, such as certain states in America, the financial burden of traditional autopsies is recognized as significant. There is a growing consensus on the necessity to embrace new technologies to reduce costs and enhance the scientific and humane aspects of forensic work. By integrating virtopsy, we can better honour the emotional and religious values of the next of kin, treating the mortal remains of their loved ones with greater respect and sensitivity. However, it is imperative to acknowledge that in cases where a traditional full autopsy is deemed necessary, it should be conducted without hesitation, ensuring that professional standards and thoroughness in forensic investigations are maintained.

Not to digress from our present topic, In medico-legal organ donation cases in India (cadaveric organ donation), once the second brain death declaration is made by the designated team of doctors, the forensic surgeon is contacted to approve the case for organ retrieval. Before granting approval, the forensic surgeon receives a requisition for an autopsy and reviews the entire file to determine if the case is suitable for organ retrieval. If approved, the retrieval process is conducted. After the organ retrieval is complete, the body is handed over to the autopsy surgeon, who then conducts the autopsy and subsequently releases the body to the relatives through police [4]. However, there have been occasional instances where the autopsy surgeon failed to intervene post-retrieval, either by not conducting an autopsy or/and by not opening the cranial cavity. There are a bunch of reasons why proceeding for a traditional autopsy post retrieval seems really difficult. Firstly, the organ retrieval process itself takes a lot of time. Following the second brain stem death declaration, the retrieval process itself often takes 1-2 days, as it hinges on the availability of transplant teams. Subsequently, if an autopsy is required post-retrieval, it adds another 4-6 hours for completion, further prolonging the wait for the deceased's relatives. Compounding this issue is the fact that many corporate hospitals where organ retrieval occurs lack adequate facilities for conducting conventional autopsies. Moreover, transporting the body to a nearby autopsy facility is time-consuming, exacerbating the distress of grieving families who have already endured a lengthy wait. More to that, in some instances, legal heirs consent to organ donation only if no traditional autopsy is performed. Virtopsy offers a legal and

respectful solution in such cases. Transplant coordinators face challenges managing brain death certifying teams, transplant teams, police and autopsy surgeons, making time management difficult. Virtopsy streamlines this process, increasing chances of organ donation in medico-legal cases by addressing legal and logistical issues, ensuring a smoother and more efficient procedure like in Non Medico Legal Cases.

These logistical challenges and practical concerns are compelling us to advocate for virtual autopsy as a viable alternative to traditional autopsy in medico-legal organ donation cases, whenever and wherever feasible. Virtual autopsy saves considerable time while achieving the necessary objectives. Moreover, most hospitals now possess the imaging facilities required to conduct whole-body Postmortem CT and MRI scans, which are integral to the virtual autopsy procedure. This approach not only enhances efficiency but also ensures comprehensive documentation of findings, supporting transparency and serving as a safeguard against allegations, particularly in regions like India where scrutiny of corporate hospital practices is intense.

Instead of remaining passive observers in medico-legal organ donation cases—where our role often ends with receiving an honorarium, conducting traditional autopsies, and sometimes facing allegations of signing death certificates after minimal examinations—we, as forensic surgeons, can enhance the significance of our work by advocating for full virtual autopsies immediately after organ retrieval. This proactive approach allows us to actively participate throughout the organ donation process, ensuring that our expertise serves a crucial purpose. Depending on the circumstances, we can opt for minimally invasive or partial autopsies, utilizing image guidance when necessary to achieve the objectives of a comprehensive medico-legal examination. This adaptive approach enables us to make informed decisions on a case-by-case basis, optimizing our involvement in organ donation program while upholding professional standards in forensic pathology.

The profession of forensic pathology is currently at a crossroads, and we must embrace change to stay relevant and create value for ourselves. The question is, to be or not to be? At this critical juncture, some advocate for abandoning traditional autopsies entirely in all medicolegal (MLC) organ donation scenarios, suggesting that we simply sign a death certificate based on antemortem radiology and medical records. Conversely, another perspective argues that the decision to conduct an autopsy in organ donation MLC cases should be left to the discretion of the autopsy surgeon.

However, placing the entire responsibility on the autopsy surgeon to decide between a full, limited, or no autopsy could lead to significant controversy and reputational issues. Instead, it should be mandated by law that at least a virtopsy be performed in these cases. This approach ensures a thorough and standardized examination, mitigating potential conflicts and enhancing the integrity of the medico-legal process.

Regarding the legality of virtopsy-based autopsy reports, Sections 65A and 65B of the Indian Evidence Act, along with corresponding changes in the new criminal codes, support the use of imageology/photographic/videographic records as evidence, provided the reporting is done by an autopsy surgeon trained in

forensic radiology [4]. The concept of no-scalpel or minimally invasive autopsies gained significant importance during the COVID-19 pandemic to reduce the spread of infection. Needless to say, virtopsy is also one such non-invasive/minimally invasive method as envisaged by the ICMR during the pandemic days.

Implementing virtopsy for medico-legal organ donation cases presents several challenges, such as the costs involved and the need for forensic pathologists to acquire new skills as forensic radiologists. To mitigate the additional costs, we can utilize existing infrastructure at corporate hospitals or institutions where organ retrieval is performed. However, viewing images in 3D, employing photogrammetry, and using devices for minimally invasive autopsies may still incur some reasonable additional costs.

To address the skills gap, efforts should be made to provide comprehensive training. A one-time training program for all forensic pathologists can be initiated, along with continuous professional development programs in forensic radiology for autopsy surgeons. Additionally, forensic radiology should be more thoroughly integrated into postgraduate curricula to ensure future pathologists are well-versed in these techniques. Training for virtual autopsy requires a solid understanding of radiological aspects, making it essential to involve radiology faculty alongside the forensic department at the medical college level. Radiologists should teach basic radiology, including CT application and precautions. Post-mortem changes and their interpretation should be mutually discussed and practiced until forensic specialists gain full skill and experience.

In conclusion, to remain compliant with the law, uphold professional standards, and ensure ethical practice in our profession, adopting virtopsy becomes a categorical imperative in dealing with MLC organ donation cases.

Statements and Declarations

Conflicts of interest

The authors declares that they do not have conflict of interest.

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