MEDIRES
Symbol of Quality Research

Clinical Case Reports and Trails
info@mediresonline.org

ISSN: 2833-2217 SHORT COMMUNICATION

Changing Perspective of Autopsy in The Modern Era and its Replacement by Artificial Intelligence

Reshma Gopi, Varsha R, Shradha V, Sreya C S, Clince Jos[1], Dr. Amit Chauha[1*]

Dr. Amit Chauhan, Amity Institute of Forensic Sciences, Amity University, India

***Corresponding Author**: Dr. Amit Chauhan, Amity Institute of Forensic Sciences, Amity University, India.

Received Date: 03 April 2023 **Accepted Date:** 10 April 2023 **Published Date:** 18 April 2023

Citation: Dr. Amit Chauhan, Reshma Gopi, Varsha R, Shradha V, Sreya C S, Clince Jose, (2023). Changing Perspective of Autopsy in The Modern Era and its Replacement by Artificial Intelligence, Journal of Clinical Case Reports and Trails. 1(3). DOI: 10.58489/2836-2217/013.

Abstract

Autopsy has been a critical tool in the medical field to determine the probable cause of death for centuries. It involves a thorough examination of the dead body and underlying medical conditions that has led to the death. Traditional autopsy involves a manual examination of the body by a pathologist. The pathologist examines the organs, tissues, and bodily fluids for any abnormalities or signs of disease. This process can be time-consuming and often requires a high level of expertise. It has possibilities to minor errors in observations such as pathological conditions, minor fractures, trace evidence and affected areas due to poison. Determination of time since death is crucial in forensic medicine yet it is performed through bio markers like LDH, pH, triglyceride, cholesterol, sodium, and potassium.

Keywords: *traditional autopsy; virtual autopsy; AI algorithm; biomarkers; statistical analysis; innovative techniques.*

Introduction

Autopsy has been a critical tool in the medical field to determine the probable cause of death for centuries. It involves a thorough examination of the dead body and underlying medical conditions that has led to the death. Traditional autopsy involves a manual examination of the body by a pathologist. The pathologist examines the organs, tissues, and bodily fluids for any abnormalities or signs of disease. This process can be time-consuming and often requires a high level of expertise. It has possibilities to minor errors in observations such as pathological conditions, minor fractures, trace evidence and affected areas due to poison. Determination of time since death is crucial in forensic medicine yet it is performed through bio markers like LDH, pH, triglyceride, cholesterol, sodium, and potassium [1].

At present, Virtual autopsy has started to replace this examination that uses modern imaging technology to obtain high-quality 3D images of the body without mutilation. It has increased range of forensic applications, such as identifying carbonized and putrefied bodies, determining the cause of death, identifying foreign bodies and reconstructing injuries. Virtual autopsy is effective for examining injuries and linking them to potential weapons used in crimes. One of the most common methods is the use of advanced imaging techniques like CT scan, MRI, and PET scans to obtain high-quality images of the body without causing any incision to the deceased. These images are then processed using AI algorithms to create 3-D models of the body, allowing forensic experts to examine the organs and tissues in detail. Another method involves the use of AI algorithms to analyze large amounts of data collected during the autopsy process, including blood tests, tissue samples, and genetic data. These algorithms can identify patterns and anomalies that may not be visible to the naked eye, allowing forensic experts to form more accurate opinions regarding the cause of death. Several methods are designed to obtain high-quality 3D images of the body in multiple planes. Computed tomography scan method uses X-rays to create detailed images of the body's internal structures. Magnetic resonance imaging method uses a magnetic field and radio waves to create images of the body's internal structures. Surface scanning method involves using a 3D scanner to create a high-resolution image of the external surface of the body. Post-mortem angiography method involves injecting a contrast agent into the body's blood vessels and using CT or MRI to create images of the blood vessels [2-3]. The virtual dissection method involves using

software to virtually dissect the body and examine the internal structures without physically cutting into the body. The images obtained are then analyzed by AI algorithms to detect any pathological conditions and injuries that may have caused the death of the individual.

AI algorithms can process large amounts of data quickly and precisely, making it possible to automate many of the manual tasks involved in traditional autopsies. For example, AI can analyze bio markers to estimate the time of death, detect signs of poisoning, and identify them. AI algorithms can identify subtle changes in tissue and organ structures that may be difficult for a human pathologist to detect. This can improve the accuracy of diagnoses and reduce the risk of misdiagnosis. Digital data generated by AI-assisted autopsies can be stored in electronic health records, making it easier for forensic pathologists and law enforcement agencies to access and share information which can speed up investigations and improve the quality of evidence presented in court [4]. The use of AI is changing the autopsy process, resulting in quicker, more precise, and less invasive procedures. Although traditional autopsies are still an essential aspect of forensic medicine, the role of AI in autopsies is set to grow significantly in the future.

References

1. Langer, R., Tröhler, A., Schnüriger, B., Trippel, M., Blank, A., Banz, Y., ... & Lugli, A. (2019). Implementation of modern tools in autopsy practice—The way towards contemporary postmortal diagnostics. *Virchows Archiv*, *474*, 149-158.
2. Oliva, A., Polacco, M., D'Alessio, P., Filograna, L., Tartaglione, T., Zobel, B., & Pascali, V. L. (2011). Will virtual autopsy technology replace the role of forensic pathologist in the future?. *The American Journal of Forensic Medicine and Pathology*, *32*(4), e17-e18.
3. Tejaswi, K. B., & Periya, E. A. H. (2013). Virtopsy (virtual autopsy): A new phase in forensic investigation. *Journal of Forensic Dental Sciences*, *5*(2), 146.
4. Cirielli, V., Cima, L., Bortolotti, F., Narayanasamy, M., Scarpelli, M. P., Danzi, O., ... & Tagliaro, F. (2018). Virtual autopsy as a screening test before traditional autopsy: the verona experience on 25 cases. *Journal of pathology informatics*, *9*(1), 28.