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Letter

The Role of Artificial Intelligence in Radiology in the Critical Care Departments

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Dear Editor,

Trauma is one of the main cause of death and one of the leading causes of disability in most countries, especially in developing countries [1]. Due to the increase in annual death statistics in this area, especially among young people, the need to improve the trauma management and treatment system in different ways, such as using medical equipment equipped with new technologies such as artificial intelligence, is raised. Finally, the result of this approach will be to update and improve treatment and rehabilitation methods for trauma victims and speed up their health recovery, especially in the case of military traumas. The primary approach of combining artificial intelligence with Treatment aims to increase the speed, success, and quality of management of trauma victims [2].

Due to the increase in annual death statistics in this trauma area, especially among young people, the need to improve the trauma management and treatment system in different ways, such as using medical equipment equipped with new technologies such as artificial intelligence, is raised. Finally, the result of this approach will be to update and improve treatment and rehabilitation methods for trauma victims and speed up their health recovery, especially in the case of military traumas. Current research shows that the primary approach of combining artificial intelligence with Treatment aims to increase the speed, success, and quality of management of trauma victims [3-7].

Lung cancer screening helps detect lung nodules, and early detection saves the lives of many patients. AI can automatically recognize these nodules and classify them as benign or malignant. With the rapid development of medical imaging, especially computed tomography and magnetic resonance imaging, an increasing number of incidental findings, including liver lesions, are being identified. AI characterizes these lesions as benign or malignant and helps prioritize the follow-up of patients with these lesions. Undetected or misclassified colon polyps pose a potential risk of colon cancer. Most polyps are benign at first but can become cancerous over time. Therefore, early detection and consistent monitoring using robust AI-based tools are critical [4-7].

Mammography examinations are technically demanding and require professional interpretation. AI can assist understanding by identifying and characterizing micro calcifications. Brain tumors are characterized by abnormal tissue growth and can be benign, malignant, primary, or metastatic. AI could be used for diagnostic prediction. Radiotherapy planning can be automated by segmenting the tumor and optimizing radiation dose [5].

Furthermore, to evaluate the outcome of radiotherapy, it is essential to assess treatment response through serial monitoring. AI can perform these evaluations, improving accuracy and speed. Screening mammography is technically challenging to interpret

expertly. AI can assist in the interpretation by identifying and characterizing micro calcifications. Brain tumors are characterized by abnormal tissue growth and can be benign, malignant, primary, or metastatic; AI could be utilized to make diagnostic predictions. Radiation therapy planning can be automated by segmenting tumors for radiation dose optimization. Also, evaluating response to treatment by monitoring over time is essential for assessing the success of radiation therapy efforts. AI can accomplish these assessments, thereby enhancing accuracy and speed [5].

Artificial intelligence needs interdisciplinary teamwork, large portions of high-quality data, and strict workflows. However, in recent years, a number of methodological innovations have given new momentum to the potentially profound impact of AI in biomedical imaging, especially in the emergency field (5-7).

Artificial intelligence has the possibility to enhance healthcare, including medical imaging. Radiologists need to be conscious of the AI tools they can use when required to improve diagnostic precision and emergency case management [4-7].

Emergency radiology is a particular field of imaging because the speed of diagnosis and treatment of various diseases is critical to saving patients' lives. Artificial intelligence has many possible applications in emergency radiology: first, image assets can be facilitated by reducing imaging time via automated localization and artificial intelligence-based reconstruction systems to optimize image quality even in critically ill patients; second, it allows efficient workflow by analyzing patient characteristics and images, identifying high-priority studies and patients with critical results. Various machine and deep learning algorithms have been introduced to identify various emergencies so that radiologists can identify meaningful results. AI reporting, patient clinical data summary, and image abnormality classification analysis can objectively characterize disease severity, leading to rapid and optimized therapy planning [3-6].

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References

1. Peden AE, Cullen P, Francis KL, Moeller H, Peden MM, Ye P, Tian M, Zou Z, Sawyer SM, Aali A, Abbasi-Kangevari Z. Adolescent transport and unintentional injuries: a systematic analysis using the Global Burden of Disease Study 2019. The Lancet Public Health. 2022 Aug 1;7(8): e657-69.

2. Busnatu Ş, Niculescu AG, Bolocan A, Petrescu GE, Păduraru DN, Năstasă I, Lupuşoru M, Geantă M, Andronic O, Grumezescu AM, Martins H. Clinical Applications of Artificial Intelligence—An Updated Overview. Journal of Clinical Medicine. 2022 Apr 18;11(8):2265.

3. Cellina M, Си M, Irmici G, Ascenti V, Caloro E, Bianchi L, Pellegrino G, D'Amico N, Papa S, Carrafiello G. Artificial Intelligence in Emergency Radiology: Where Are We Going? Diagnostics. 2022 Dec 19;12(12):3223.

4. Katzman BD, van der Pol CB, Soyer P, Patlas MN. Artificial intelligence in emergency radiology: A review of applications and possibilities. Diagnostic and Interventional Imaging. 2022 Aug 4.

5. Hosny A, Parmar C, Quackenbush J, Schwartz LH, Aerts HJ. Artificial intelligence in radiology. Nature Reviews Cancer. 2018 Aug;18(8):500-10.

6. Jalal S, Parker W, Ferguson D, Nicolaou S. Exploring the role of artificial intelligence in an emergency and trauma radiology department. Canadian Association of Radiologists Journal. 2021 Feb;72(1):167-74.

7. Moawad AW, Fuentes DT, ElBanan MG, Shalaby AS, Guccione J, Kamel S, Jensen CT, Elsayes KM. Artificial intelligence in diagnostic radiology: Where do we stand, challenges, and opportunities. Journal of computer assisted tomography. 2022 Jan 1;46(1):78-90.