The CT scan is for the unstable medical patient

Mohammed Alageel^{1,2}

Received: 21 August 2021 / Accepted: 17 September 2021 / Published online: 6 October 2021

© The Author(s), under exclusive licence to Canadian Association of Emergency Physicians (CAEP)/ Association Canadienne de Médecine d'Urgence (ACMU) 2021

Keywords Resuscitation · Emergency medicine · Emergency radiology · Shock

Dear Editor,

In clinical practice clinicians are often faced with hemodynamically unstable patients. Most often the cause of hemodynamic instability can be determined through bedside clinical assessment and a thorough history. In some cases, the exact cause is not readily apparent, and the physician is faced with a sick patient and an uncertain cause requiring them to initiate empirical treatments. Often advanced imaging, namely computed tomography (CT) for its availability and ease of acquisition, can be used in furthering the diagnosis by establishing a cause or ruling out potential others. The decision to take an unstable patient to the CT is met with pushback, due to fear of deterioration in the CT room and lack of set up of the area itself to manage it. Hence the commonly taught principle “unstable patients should not go to the CT scan”. There is an argument to be made that the CT is one of the most important tools in the treatment of the unstable patient.

The primary tenants of cardiac arrest management that consistently demonstrate positive outcomes are early defibrillation, and cardiopulmonary resuscitation (CPR). A third tenant is the search for reversible causes. Although commonly taught it is often difficult to identify and is thus rarely addressed with cause-specific treatment [1], and based on basic physiological principles is likely directly related to improving patient's outcomes. For the sick patient requiring active resuscitation, the body is in a failing state and if not intervened on in a timely manner will eventually degrade

into cardiopulmonary collapse. For what is resuscitation except intervening to reverse a clinical death in progress [2].

No better medical literature understands the urgency of identifying a cause, more than trauma literature. Where the necessity of identifying the cause of hemodynamic compromise or potential hemodynamic compromise is key to survival. With increasing literature demonstrating the benefit of computed tomography in severely injured patients with hemodynamic instability, it has even spurred the term “damage control radiology” [3]. It seems this mind set has failed to creep into routine medical practice, even though emergency advanced imaging can define a multitude of etiologies that benefit from early intervention and alters medical decision making [4]

Recent guidelines have suggested the role of bedside ultrasonography for its ability to identify causes of shock and allow earlier intervention without need to move the patient. Unfortunately no clear improved outcomes have been demonstrated regarding using ultrasonography in shock or cardiac arrest patients [5]

The philosophy of care that “unstable” patients should not be taken to the CT scanner is widely accepted but not based on any evidence. When a patient is dying and the cause is unclear, then we as physicians have two morally compelling choices; to pursue every reversible cause or believe the patient's specific etiology or demographics have deemed it medically futile to intervene. Following a third route of “wait and see” till the patient improves, if they do, adheres to the logic of doing nothing but expecting something.

✉ Mohammed Alageel
moe.alageel@gmail.com

¹ King Khalid University Hospital, Emergency medicine, Riyadh, Saudi Arabia

² UBC Department of Emergency Medicine, Vancouver, BC, Canada

Author contributions MA drafted the manuscript in entirety and the performed the literature search.

Funding None.

Declarations

Conflict of interest The authors report no conflict of interests.

References

1. Bergum D, Nordseth T, Mjølstad OC, Skogvoll E, Haugen BO. Causes of in-hospital cardiac arrest—incidences and rate of recognition. *Resuscitation*. 2015;1(87):63–8.
2. Van Walraven C, Forster AJ, Parish DC, Dane FC, Chandra KMD, Durham MD, et al. (2001) (reverse death in progress) Validation of a clinical decision aid to discontinue in-hospital cardiac arrest resuscitations. *J Am Med Assoc* 285(12):1602–6. Available from: <https://jamanetwork.com/> [cited 2021 Jun 23]
3. Chakraverty S, Zealley I, Kessel D (2014) (Damage control radiology) In the severely injured patient: what the anaesthetist needs to know. Vol. 113, *British Journal of Anaesthesia*. Oxford University Press pp 250–7. Available from: <https://academic.oup.com/bja/article/113/2/250/264221> [cited 2021 Jun 23]
4. Pescatori LC, Brambati M, Messina C, Mauri G, Di Leo G, Silvestri E, et al. (2018) Clinical impact of computed tomography in the emergency department in nontraumatic chest and abdominal conditions. *Emerg Radiol* 25(4):393–8. Available from: <https://pubmed.ncbi.nlm.nih.gov/29536277/> [cited 2021 Jun 23]
5. Shokoohi H, Boniface KS, Pourmand A, Liu YT, Davison DL, Hawkins KD, et al. (2015) Bedside ultrasound reduces diagnostic uncertainty and guides resuscitation in patients with undifferentiated hypotension. *Crit Care Med* 43(12):2562–9. Available from: <https://pubmed.ncbi.nlm.nih.gov/26575653/> [cited 2021 Jun 23]