

Ahmad Misbahul Munir Saifullah
Emergency and Trauma Department,
Seri Manjung Hospital, Perak, Malaysia.

INTRODUCTION:

Managing hemodynamically unstable, morbidly obese polytrauma patients presents significant challenges. Polytrauma is defined as multiple traumatic injuries that affect more than one body system or organ, with at least one life-threatening injury. These patients often require urgent, comprehensive medical interventions to assess and address their critical conditions. In contrast, obesity is classified as having a body mass index (BMI) of 35 or higher, which introduces additional complications in trauma management, such as difficulties in physical assessment, airway management, and imaging. Multiple studies and reviews have strongly suggested obesity to be associated with increased risk for postinjury morbidity and mortality. As obesity is associated with a pro-inflammatory state, it has been suggested to negatively affect the respiratory, cardiovascular, coagulation, and renal systems and the ability and manner in which an obese patient heals (Brahmbhatt et al., 2017). Early WBCT scans have emerged as a valuable tool for the comprehensive evaluation of these patients, offering advantages over traditional X-ray techniques.

REPORT:

A 47-year-old man with hypertension and a BMI of 39.2 was involved in a motor vehicle accident between a car and a lorry. Then, the patient was brought to the ED. Initial management was done, and bedside x-rays and EFAST were performed with limited visualization. Hence, a further radiological exam was needed. Despite emergency medical interventions, the patient experienced two cardiac arrests while in the CT suite and was pronounced deceased there. He suffered multiple bilateral rib fractures with hemothorax, a third thoracic vertebral fracture, severe traumatic brain injury and intra-abdominal bleed.

DISCUSSION:

WBCT scans have been proven to offer superior imaging with high sensitivity and specificity to detect injuries compared to other radiological modalities. Studies have consistently demonstrated that integrating WBCT early trauma care significantly increased the probability of survival in patients with polytrauma. Meta-analyses of observational studies reveal that WBCT improves injury detection across various body regions, such as the head, chest, and abdomen, significantly reducing predicted mortality rates. For example, one large study found that WBCT was associated with a 25% reduction in mortality compared to trauma scores predicting outcomes based on selective imaging (Fathi et al., 2024; Long et al., 2017). Additionally, studies have demonstrated that WBCT aids in quicker and more comprehensive assessments, which can directly impact the early management of trauma patients and lead to higher survival rates (Long et al., 2017). In one retrospective study, WBCT decreased mortality in a cohort of over 16,000 patients, confirming its life-saving potential (Murphy & Jones, 2010). Although the radiation risk remains a topic of debate, WBCT is far superior when investigating the obese population. One study highlighted that the average radiation dose from a WBCT scan is around 31.8 mSv, which carries a median excess lifetime cancer risk of 1 in 474 for patients undergoing this imaging modality. This risk is particularly concerning for younger patients, as they are more sensitive to radiation exposure over their lifetime (Davies et al., 2016; Mulas et al., 2022). Despite this, many experts argue that the immediate benefits of WBCT in trauma scenarios, such as quicker detection of life-threatening injuries and improved survival rates, can outweigh the long-term radiation risks, especially for severely injured patients. For instance, patients with higher injury severity scores (ISS) and those with multiple body injuries benefit significantly from the comprehensive imaging provided by WBCT, as it can rapidly guide medical decisions (Davies et al., 2016; Linder et al., 2016). To mitigate the radiation risks, some researchers have proposed more selective criteria for WBCT use, including decision tools that consider clinical signs, the mechanism of injury, and the patient's condition. These tools aim to reduce unnecessary scans without compromising the detection of significant injuries (Davies et al., 2016). WBCT offers several benefits for investigating polytrauma patients, including comprehensive coverage, detailed imaging, rapid scanning, and high diagnostic confidence. While X-rays have their place in initial assessments and specific contexts, WBCT is the gold standard for a thorough and accurate evaluation of polytrauma patients; one meta-analysis confirmed a significant reduction in mortality among trauma patients who underwent WBCT compared to those who had selective radiological imaging, highlighting its effectiveness in critical care (Jiang et al., 2014; Lang et al., 2017). Additionally, WBCT reduces the risk of imaging complications, such as excessive manipulation of limbs during X-rays, and prevents missed injuries due to the undetailed and specific nature of X-rays (Maghraby et al., 2020).

CONCLUSION:

Hospitals equipped with CT scans should consider implementing WBCT for polytrauma patients and incredibly obese populations. WBCT scans are highly effective in detecting intra-abdominal, spinal, and pelvic injuries in polytrauma patients, particularly in obese individuals where other imaging modalities like X-rays and EFAST can be less reliable. Studies have demonstrated that WBCT offers better visualization of complex injuries such as abdominal bleeding, organ lacerations, and fractures of the spine and pelvis, which are often challenging to detect in patients with higher body mass due to limitations in ultrasound and X-ray penetration. For example, research has shown that WBCT is more sensitive than ultrasound (FAST or EFAST) for detecting injuries in obese trauma patients because obesity can interfere with the quality of ultrasound images. In cases of blunt trauma, where intra-abdominal bleeding or solid organ damage might be present, CT scanning provides a more comprehensive assessment than X-ray, which can miss subtle or deep-seated injuries (Hong & Lee, 2019).

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