

KÜNT TRAVMADA PAN-CT/SELEKTİF CT?

Bedriye Müge Sönmez

Ankara Numune Eğitim ve Araştırma Hastanesi Acil Tıp Kliniği Başasistanı

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- ✘ Travma <45 yaş mortalitenin en sık nedeni
 - ✘ Sağlık harcamaları açısından ciddi bir potansiyel
 - ✘ Modern travma bakımında amaç yaralanmaların erken tanı ve tedavisi
 - ✘ Tüm algoritmalar \propto mortalite↓

- ✘ Bilgisayarlı tomografi (BT) modern tıp açısından en önemli teknolojik gelişmelerden
- ✘ İlk defa 1990'ların başında spiral, 1998'de multislice BT
- ✘ Teknolojik gelişim ile beraber travma hastalarının değerlendirilmesinde kullanımı ve önemi ↑
- ✘ Travma hastalarında gözden kaçan yaralanmalar mortalite ve morbidite açısından önemli
- ✘ İlk defa 1997'de Low, 2001'de ise Ptak ve arkadaşları tarafından tüm vücut taraması (pan-scan)/pan-CT gündeme getirilmiş

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- ✘ Tek sekansta ardışık baş-boyun-toraks-abdomen-pelvis taraması
 - ✘ Kolay, hızlı, **diagnostik güvenilirlik**, erken güvenli taburculuk, AS'de kalış süresinin minimizasyonu
 - ✘ Yüksek maliyet, radyasyon maruziyeti, kontrast nefropati riski



Primary pan-computed tomography for blunt multiple trauma: can the whole be better than its parts?

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mortality

Summary¹ Single-pass, whole-body computed tomography (pan-CT) was proposed in the late 1990s as a new concept for the diagnostic work-up of severely injured patients. Since its introduction, it has led to considerable debate among clinicians and scientists, triggered by concerns about its immediate safety, questionable therapeutic advantages and exposure to radiation. However, it was recently shown that pan-CT scanning may be associated with a reduction in trauma mortality.

In this article, we provide an overview of current knowledge of the value of this compelling concept. The diagnostic accuracy of multidetector row CT (MDCT) for clearing various anatomical regions in trauma patients is, at best, unclear. Little is known about the accuracy of pan-CT as a whole, which weakens statements about its effectiveness and prevents inferences about survival advantages. This last point may be explained by a stage-migration or “Will Rogers” phenomenon: Pan-CT increases injury severity by detecting lesions that would not have been recognized by conventional methods but still do not affect treatment decisions, thus artificially lowering the ratio of observed to expected deaths. In order to maintain the credibility of pan-CT technology for trauma, a rigorous, large-scale evaluation of its accuracy is required. Such an evaluation requires consensus about the definition of true and false positive and negative findings in the setting of blunt multiple trauma. In addition, triage criteria need to be refined to increase specificity and reduce the number of unnecessary scans.

Effect of whole-body CT during trauma resuscitation on survival: a retrospective, multicentre study

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Summary

Background The number of trauma centres using whole-body CT for early assessment of primary trauma is increasing. There is no evidence to suggest that use of whole-body CT has any effect on the outcome of patients with major trauma. We therefore compared the probability of survival in patients with blunt trauma who had whole-body CT during resuscitation with those who had not.

Methods In a retrospective, multicentre study, we used the data recorded in the trauma registry of the German Trauma Society to calculate the probability of survival according to the trauma and injury severity score (TRISS), revised injury severity classification (RISC) score, and standardised mortality ratio (SMR, ratio of recorded to expected mortality) for 4621 patients with blunt trauma given whole-body or non-whole-body CT.

Findings 1494 (32%) of 4621 patients were given whole-body CT. Mean age was 42.6 years (SD 20.7), 3364 (73%) were men, and mean injury-severity score was 29.7 (13.0). SMR based on TRISS was 0.745 (95% CI 0.633–0.859) for patients given whole-body CT versus 1.023 (0.909–1.137) for those given non-whole-body CT ($p < 0.001$). SMR based on the RISC score was 0.865 (0.774–0.956) for patients given whole-body CT versus 1.034 (0.959–1.109) for those given non-whole-body CT ($p = 0.017$). The relative reduction in mortality based on TRISS was 25% (14–37) versus 13% (4–23) based on RISC score. Multivariate adjustment for hospital level, year of trauma, and potential centre effects confirmed that whole-body CT is an independent predictor for survival ($p \leq 0.002$). The number needed to scan was 17 based on TRISS and 32 based on RISC calculation.

Interpretation Integration of whole-body CT into early trauma care significantly increased the probability of survival in patients with polytrauma. Whole-body CT is recommended as a standard diagnostic method during the early resuscitation phase for patients with polytrauma.

Incidence and predictors of missed injuries in trauma patients in the initial hot report of whole-body CT scan

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ABSTRACT

Background: Whole-body CT scan is the cornerstone of trauma-related injury assessment. Several lines of evidence indicate that significant number of injuries may remain undetected after the initial hot report of CT. Missed injuries (MI) represent an important issue in trauma patients, for they may increase morbidity, mortality and costs. The aim of this study was to examine incidence and predictors of MI in trauma patients undergoing whole-body CT scan.

Methods: 177 CT scan performed upon admission of trauma patients during year 2005 were reviewed by a radiologist blinded to patient's initial data. MI was defined as injuries not written in the initial report. Patients with and without MI were compared to determine predictors of MI by multivariable analysis. **Results:** 157 MI were diagnosed in 85 (47%) patients. MI was predominantly encoded AIS 2 (57%) or 3 (29%). Patients with MI had significantly higher SAPSII, higher ISS and were more frequently sedated. Age over 50 years (OR: 4.37, $p = 0.003$) and ISS over 14 (OR: 4.17, $p < 0.0001$) were independent predictors of MI. Median ISS after encoding MI was significantly higher than initial ISS (22 vs. 20 $p < 0.0001$). After adjustment for severity, mortality and length of stay were not different between patients with or without MI.

Conclusion: Trauma patients, especially aged and severe, experienced a high rate of missed injuries in the initial hot report which appeared to be predominantly minor and musculoskeletal, advocating a CT scan second reading.

Selective Use of Computed Tomography Compared With Routine Whole Body Imaging in Patients With Blunt Trauma

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Study objective: Routine pan-computed tomography (CT, including of the head, neck, chest, abdomen/pelvis) has been advocated for evaluation of patients with blunt trauma based on the belief that early detection of clinically occult injuries will improve outcomes. We sought to determine whether selective imaging could decrease scan use without missing clinically important injuries.

Methods: This was a prospective observational study of 701 patients with blunt trauma at an academic trauma center. Before scanning, the most senior emergency physician and trauma surgeon independently indicated which components of pan-CT were necessary. We calculated the proportion of scans deemed unnecessary that: (a) were abnormal and resulted in a pre-defined critical action or (b) were abnormal.

Results: Pan-CT was performed in 600 of the patients; the remaining 101 underwent limited scanning. One or both physicians indicated a willingness to omit 35% of the individual scans. An abnormality was present in 18% of scans, including 22% of desired scans and 10% of undesired scans. Among the 95 patients who had one of the 102 undesired scans with abnormal results, 3 underwent a predefined critical action. There is disagreement among the authors about the clinical significance of the abnormalities found on the 99 undesired scans that did not lead to a critical action.

Conclusion: Selective scanning could reduce the number of scans, missing some injuries but few critical ones. The clinical importance of injuries missed on undesired scans was subject to individual interpretation, which varied substantially among authors. This difference of opinion serves as a microcosm of the larger debate on appropriate use of expensive medical technologies. [Ann Emerg Med. 2011;58:407-416.]

Please see page 408 for the Editor's Capsule Summary of this article.

Effects on mortality, treatment, and time management as a result of routine use of total body computed tomography in blunt high-energy trauma patients

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BACKGROUND: Currently, total body computed tomography (TBCT) is rapidly implemented in the evaluation of trauma patients. With this review, we aim to evaluate the clinical implications—mortality, change in treatment, and time management—of the routine use of TBCT in adult blunt high-energy trauma patients compared with a conservative approach with the use of conventional radiography, ultrasound, and selective computed tomography.

METHODS: A literature search for original studies on TBCT in blunt high-energy trauma patients was performed. Two independent observers included studies concerning mortality, change of treatment, and/or time management as outcome measures. For each article, relevant data were extracted and analyzed. In addition, the quality according to the Oxford levels of evidence was assessed.

RESULTS: From 183 articles initially identified, the observers included nine original studies in consensus. One of three studies described a significant difference in mortality; four described a change of treatment in 2% to 27% of patients because of the use of TBCT. Five studies found a gain in time with the use of immediate routine TBCT. Eight studies scored a level of evidence of 2b and one of 3b.

CONCLUSION: Current literature has predominantly suboptimal design to prove terminally that the routine use of TBCT results in improved survival of blunt high-energy trauma patients. TBCT can give a change of treatment and improves time intervals in the emergency department as compared with its selective use. (*J Trauma*. 2012;72: 553–559. Copyright © 2012 by Lippincott Williams & Wilkins)

KEY WORDS: CT; trauma; mortality; time; outcome.

Systematic review of the benefits and harms of whole-body computed tomography in the early management of multitrauma patients: Are we getting the whole picture?

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BACKGROUND:	There is considerable interest in whether routine whole-body computed tomography (WBCT) imaging produces different patient outcomes in blunt trauma patients when compared with selective imaging. This article aimed to systematically review the literature for all outcomes measured in comparing WBCT with selective imaging in trauma patients and to evaluate the comprehensiveness of relevant dimensions for this comparison.
METHODS:	We performed a systematic review of studies comparing WBCT and selective imaging approaches during the initial assessment of multitrauma patients. Peer-reviewed studies including cohort studies, randomized controlled trials, meta-analyses, and systematic reviews were identified through large database searches and filtered through methodologic inclusion criteria. Data on study characteristics, hypotheses and conclusions made, outcomes assessed, and references to potential benefits and harms were extracted.
RESULTS:	Eight retrospective cohort studies and two systematic reviews were identified. Six primary studies evaluated mortality as an outcome, and four studies found a significant difference in results favoring WBCT imaging over selective imaging. All five articles assessing various time intervals in hospital following imaging after injury found significantly reduced times with WBCT. Radiation exposure was found to be increased after WBCT imaging compared with selective imaging in the only study in which it was evaluated. The two systematic reviews analyzed the same three articles with regard to mortality but concluded differently about overall benefits.
CONCLUSION:	WBCT imaging seems to be associated with reduced times to events in hospital following traumatic injury and seems to be associated with decreased mortality. Whether this is a true effect mediated through an as yet unsubstantiated change in management or the result of hospital- or individual-level confounders is unclear. When evaluating these outcomes, it seems that the authors of both primary studies and systematic reviews have often been selective in their choice of short-term outcomes, painting an incomplete picture of the issue. (<i>J Trauma Acute Care Surg.</i> 2014;76: 1122–1130. Copyright © 2014 by Lippincott Williams & Wilkins)
LEVEL OF EVIDENCE:	Systematic review, level III.
KEY WORDS:	Trauma; computed tomography; imaging; radiation; outcome.

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- ✖ Hastanın kliniği
 - ✖ Kar-zarar durumu