

Summary

Detection rate of active bleeding and number of nonoperative treatment is increasing in trauma evaluated by whole-body multi-detector row computed tomography (MDCT) imaging. The aim of the study is to evaluate a MDCT detection of the active bleeding in trauma patients. We reviewed MDCT images for the presence of active hemorrhage in our data files. The site and number of the bleeding sites was noted. The size, area, density and relative density of the hemorrhage was noted, together with the nature and size of the surrounding hemorrhage hematoma. We also evaluated clinical factors as age, sex, the Injury Severity Score (ISS), Glasgow Coma Scale (GCS), systolic blood pressure on admission (SBP), heart rate (HR), hemodynamic status of the patient (HDO) and fluid resuscitation. Results were compared with clinical follow up or intraoperative findings (nonoperative management vs. intervention, dead or alive pts. in 30 day). The authors evaluated consecutive trauma patients examined between 2004-2008 and 2010-2013 who underwent whole-body or abdominal MDCT, and were examined 967 patients.

Active bleeding was detected in 128 (13,2 %) of 967 patients. A total of 183 sources of active extravasation were identified. Eighty-six (47 %) of 183 bleeding sites underwent immediate intervention – surgical or endovascular. Subsequent clinical management is strongly dependent on the site of active extravasation ($p < 0,00001$). The diameter ($p < 0,000001$), area ($p < 0,000001$), density ($p = 0,013881$) and relative density ($p = 0,026071$) of active extravasation were significantly higher in patients who underwent intervention. For predicting subsequent therapy of choice is the most accurate model using localization of bleeding, the size of active bleeding and hematoma in the area of active bleeding. Prediction accuracy is 81,7 %.

Mortality 30-th day after the injury was 43 % (55/128) of patients, survived 57 % of patients (73/128). The size ($p = 0,00978$) and area ($p = 0,0062$) of active extravasation, GCS ($p < 0,000001$) and ISS ($p < 0,000001$) scores were significantly higher in patients who died. The best prediction of patient treatment outcome is achieved on a combination of ISS, GCS and hemodynamic patient's response to resuscitation. Prediction accuracy is 84 %.