

Predictors of Mortality for Upper Extremity Penetrating Vascular Injuries (UEPVI)

Broecker JS, Kochuba M, Skarupa D, Zhang J, Crandall M

Objectives:

The morbidity associated with upper extremity penetrating vascular injuries (UEPVI) are well known; however, mortality and its predictors are not as well understood. The objective of this study was to determine the predictors of mortality among patients with upper extremity penetrating vascular injuries (UEPVI).

Methods:

A retrospective review of all UEPVI patients presenting to a level I trauma center between 1986 and 2019 was performed. SPSS Statistical Software was used to perform bivariate statistics and multivariate logistic and linear regression analyses to determine the independent predictors of mortality and hospital length of stay (LOS) using the covariates race, age, gender, insurance status, ISS, mechanism of injury and ED disposition.

Results:

Among 481 total patients, the majority were male (87%) Caucasian (52%), uninsured/underinsured (52%). 58% of injuries were caused by assault or self-inflicted, most commonly gun-shot wounds (23%) or stab wounds (22%). 60% underwent surgery for their injuries. The most common vascular procedures were primary repair of the artery (31%) or distal arterial ligation (21%). On bivariate analysis, female patients had a higher injury severity score (ISS) (mean 9.55 compared to 6.77, $p=0.02$), were more likely to go to the operating room (40.6% compared to 24.2%, $p=0.02$), but had a lower mortality (1.6% compared to 4.8%, $p=0.009$) compared to male patients. On multivariate analysis, older age (R 0.94, 95% CI: 0.89-0.99, $p=0.03$) and higher ISS (OR 0.79, 95% CI: 0.72-0.87, $p<0.001$) were both associated with increased risk-adjusted mortality. Lack of insurance/underinsurance (OR 5.17, 95% CI: 1.09-24.61, $p=0.04$) was also associated with increased mortality, though race was not ($p=0.22$).

Conclusion:

Our retrospective analysis demonstrated that the majority of penetrating upper extremity vascular injuries are incurred by men and are associated with assaultive or self-directed violence. On multivariate analysis, older age, higher ISS, and lack of insurance or underinsurance were associated with increased mortality. Future studies should investigate preventive strategies aimed at reducing UEPVI among at-risk individuals identified in this study.