

Associations Between Concomitant Traumatic Injuries and Time to Friction Burn Management in Polytrauma Patients

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Background/Objective

Friction burns frequently accompany high-energy trauma, but the effects of different concomitant injuries on wound management are poorly characterized. Competing priorities in polytrauma patients may delay friction burn-specific care and affect subsequent outcomes. This study evaluated whether concomitant injury category was associated with time to friction burn management and clinical outcomes.

Methods

A prospective observational study of adults with friction burns and concomitant traumatic injuries was conducted at an urban Level 1 Trauma Center over 3 months. Injuries were categorized as orthopedic, traumatic brain injury (TBI), thoracic, abdominal, other, or multisystem. The primary outcome was time from hospital arrival to first definitive burn-specific management. Secondary outcomes included management trajectory and modalities, debridement burden, and hospital length of stay (LOS). Continuous and categorical outcomes were compared using Kruskal-Wallis and Fisher's exact tests, respectively, with Holm adjustment for multiple comparisons.

Results

Fifty patients met eligibility criteria: 28 orthopedic, 10 multisystem, 8 other, 3 TBI, and 1 abdominal. Thirty-three (66.0%) received burn-specific management; 26 were managed nonoperatively and 7 operatively, while 17 (34.0%) had no burn-specific management documented. Among treated patients, median time to first management was 4.07 hours (IQR 2.45–6.40) and did not differ by injury category ($p=0.698$). Injury category was not associated with management trajectory ($p=0.572$) or specific management modalities (all Holm-adjusted $p\geq 0.662$). LOS differed across injury categories ($p=0.016$), although pairwise comparisons were not significant after adjustment for multiple comparisons. Among 7 operatively managed patients, 3 (42.9%) required repeat burn-related intervention. No wound infections were documented among 47 patients with available outcome data.

Conclusions

Concomitant injury category was not associated with friction burn management timing or trajectory, although hospital LOS differed significantly across injury groups. Despite differences in LOS, burn management timing remained similar across injury groups. Larger cohorts are needed to evaluate these relationships across more balanced injury groups.