

THE EFFECT OF THE TIBIA ELEMENT ON THE TIBIA RESPONSE DUE TO IMPACT LOADING

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Abstract

Lower leg injury risk is commonly assessed using lower limb surrogates. The HIII and the THOR-Lx has been shown to have low biofidelity due to their geometry and material properties. A new surrogate (the MIL-Lx) was developed to address these issues, specifically for anti-vehicular mine blast scenarios. The aim of this study was to assess under impact loading to ensure that it represents the natural lower leg response. Axial impact loads were applied to the MIL-Lx at impact velocities of 2.7 to 10.2 m/s using the Modified Lower Limb Impactor (MLLI). The results revealed that the MIL-Lx leg possessed sufficient sensitivity to distinguish under-match and over-match impact severity. The tibia element has a significant effect on the lower loads in the leg and may influence injury assessment results.