On the Sixth Mechanism of Lightning Injury

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Abstract:

The work presented in this thesis extends and contributes to research in the field of lightning injury mechanisms. Six mechanisms have been described in the literature about lightning injury. This thesis takes an in-depth look at the sixth injury mechanism. The sixth mechanism may be thought of as a 'pressure-shock wave' which is directly proportional to the current of the lightning discharge, and which is present immediately surrounding lightning's luminous channel. A literature review, case studies and two novel experiments helped confirm the sixth mechanism's existence. The medical data and the lightning data were then aligned. Two main questions were addressed, namely within what range is a human at risk; and what is the risk of lightning's pressure shock wave. This 'pressure-shock wave' may explain some of the more curious lightning injury patterns seen on lightning-strike victims.

Knowledge and insight into the sixth mechanism may have direct and indirect applications to those working in the fields of lightning injury and lightning protection.

This thesis represents a contribution to the literature in both medicine and engineering.