

Abstract Submitted
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The pathogenesis of retinal damage in human eye under impact and blast load LUCA ESPOSITO, NICOLA BONORA, University of Cassino, Italy, TOMMASO ROSSI, Rome Ophthalmic Hospital, Italy — Human eye subjected to non penetrating impact (blunt-impact) may experience severe damage. The most common type is partial tearing of the retina at specific eye locations. In ophthalmology, based on impact experiment performed by Delori et al. (1967), it is commonly accepted that the mechanism responsible for retinal damage is the vitreous pull-traction action and the equatorial expansion of the sclera. Based on the evidence of a vitrectomized patient who reported retinal damage after blunt impact, an investigation on the possible role of shockwave dynamics in the retinal damage has been performed by means of hydrocode numerical simulation. A FEM model of the eye has been developed and the experiment of Delori et al. has been reproduced. Soft tissues constitutive response has been determined by means of reverse engineering approach. It has been demonstrated that release waves at the retina-choroid interface are generated in the early time of the blunt impact and can cause retina tearing when the eye bulb is still undeformed. This result has been also confirmed for the case of blast-load exposure

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