Hydrodynamics of Wound Ballistics

Authors : Harpreet Kaur, Er. Arjun, Kirandeep Kaur, P. K. Mittal

Abstract : Simulation of a human body from a 20% gelatin & 80% water mixture is examined from a wound ballistics point of view. Parameters such as incapacitation energy & temporary to permanent cavity size & tools of hydrodynamics have been employed to arrive at a model of the human body similar to the one adopted by NATO. Calculations using equations of motion yield a value of 339 μs in which a temporary cavity with maximum size settles down to a permanent cavity. This occurs for 10mm size bullets & settles down to a permanent cavity in the case of 4 different bullets, i.e., 5.45, 5.56, 7.62,10 mm sizes. The obtained results are in excellent agreement with the body as a right circular cylinder of 15 cm height & 10 cm diameter. An effort is made here in this work to present a sound theoretical base to parameters commonly used in wound ballistics from field experience discussed by Col Coats & Major Beyer.

Keywords : gelatine, gunshot, hydrodynamic model, oscillation time, temporary and permanent cavity, wound ballistics
Conference Title : ICMAA 2024 : International Conference on Mathematics in Art and Architecture
Conference Location : Miami, United States
Conference Dates : March 11-12, 2024