



Numerical Modelling of Blunt Traumatic Aortic Rupture

Objective

□ To implement a physiologically realistic material model for blood vessel tissue into a finite element based FSI solver for use in simulations of blunt traumatic aortic rupture (BTAR) during vehicle impact

Methodology

- Holzapfel material model is used for modelling the individual arterial layers.
- This material model is capable of producing full Cauchy tensor and to model aortic impact conditions
- User-defined material subroutine are introduced and Implemented in FORTRAN and compiled into new LS-DYNA 970 .exe

Outcome

□ Currently available material models for the description of aortic behaviour in numerical codes do not provide sufficient accuracy necessary for the detailed analysis of the mechanics of the system, but present study shows that Holzapfel material model does have good potential of numerically modelling the dynamic behaviour of arterial layers.

