D23 Injuries Arising From Glass Drinking Vessels Used in Stabbing and Slashing Attacks

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The goal of this presentation is to show how breakage of glass pints used in stabbing and slashing attacks can cause injury and the typical forces that are generated by an attack with a glass drinking vessel.

This presentation will impact the forensic science community by assisting forensic engineers and other professionals who need to interpret glass injuries to understand the forces generated and the way in which the glass fracture and fragmentation leads to injury.

Recent reports in the United Kingdom estimate the annual cost to the National Healthcare System as a result of alcohol harm at £2.7bn. Glassware is used as an impulsive weapon in 4% of violent incidents in the United Kingdom. The injuries that occur can be significant, leading to serious injury and death and usually fall into categories of either stabbing or slashing. Injuries can also have a component of blunt force trauma depending on the way in which the weapon is used. In order to better understand the injury potential of different types of glassware and measure the forces involved in glass-related attacks, a study has been conducted using English pint glasses, in particular "Nonic" glasses and "Tulip" glasses. Slapping attacks, where a glass is held in the hand and slapped onto the victim, are dynamic attacks and in order to determine the level of force that can be generated, a novel force-plate dynanometer was used to record the peak forces generated by a number of assailants. A typical example of the force-time data is shown in Figure 1. The peak force generated in this instance was 1,208N. The further peaks arise from the dynamic oscillations (vibrations) induced in the dynanometer by the initial impact. The force generated is considerable and easily sufficient to penetrate skin with a glass fragment from the fracture of the glass on impact.

Additionally, high-speed video was used to record the way in which the glasses fractured and any shards from the glasses penetrated a synthetic skin simulant. Tests were made onto both a flat plate and a mannequin head. A silicone rubber skin simulant was used to allow the damage created by shards to be assessed. Annealed and tempered glassware was tested and the glass fracture patterns and types of shards that are generated were compared in terms of the damage that was obtained. The average force generated during a slapping attack was found to be ~1,000N. This is a significant force and therefore it would be expected that the injuries would be a combination of blunt force injuries and sharp force injuries from the glass fragments that result on impact. The results of the engineering experiments are presented in terms of observed forces and damage patterns and compared to those found in a pathology context in order to gain an improved insight into the way in which injuries arise in assaults using glass as an impulsive weapon.

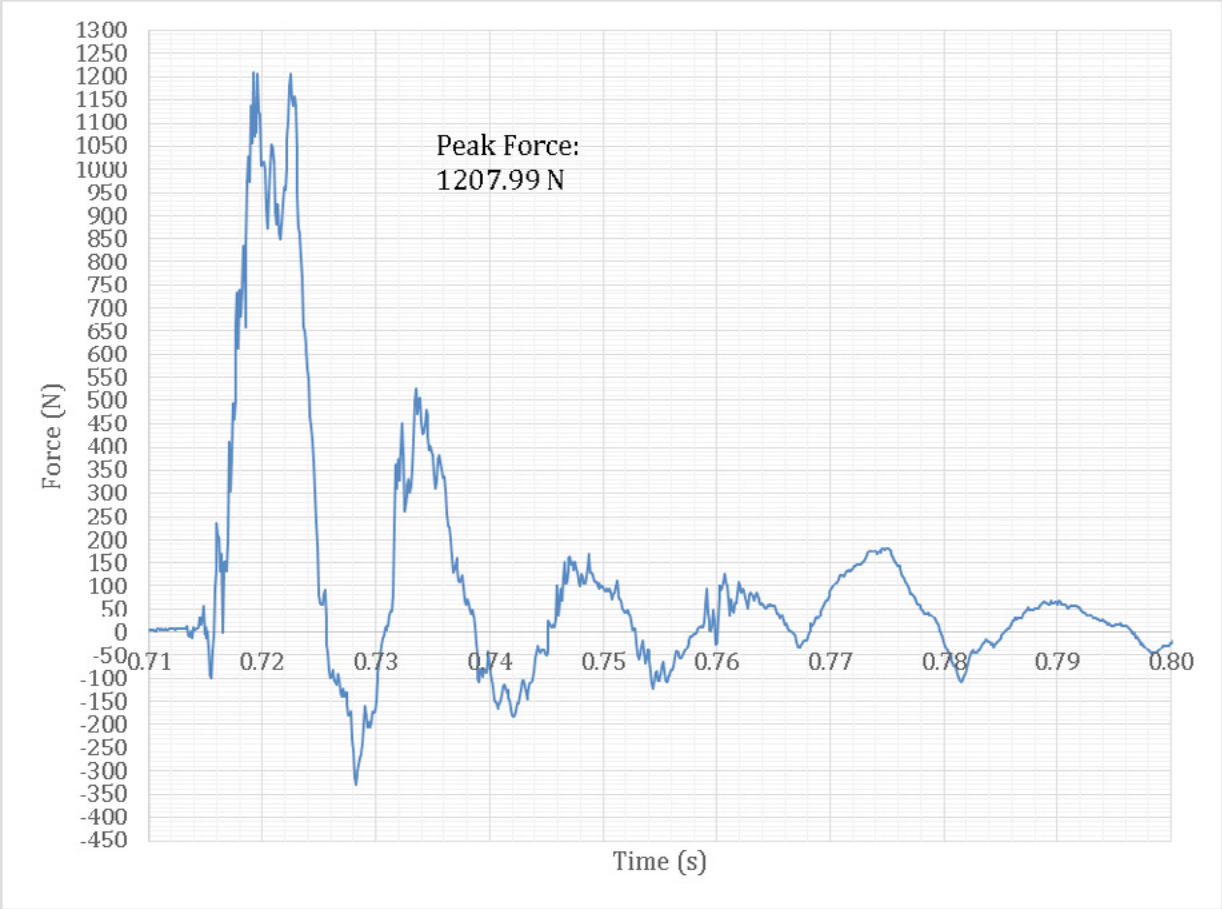

Figure 1: A force-versus-time graph for a slap with a "Tulip" geometry glass

Glass, Glassing, Fracture