Discussion and Conclusions

The results demonstrate that there are relationships between the impact angle and several characteristics of the resultant trauma which could indicate the direction of force in violent cases (creating secondary trauma). In this study, increasing the impact angle of the force directed towards the skull enabled the observer to infer the position of an assailant during an attack.

All the instances in this study were direct from above or to the left side of the skull as the impact angle increased, resulting in an increased occurrence of damage to the right side of the skull. The force generated against the base plate would be greater in this area. No mandibular fractures were recorded on the corpus once the impact angle past 18°, indicating that the force was directed through the naso as it became the primary area in contact with the baseplate. This is also represented through the change from complete and partial fractures to shaving fractures for the impact angles of 27° and 30°.

There are increasing numbers of reports in the media of violent crimes involving blunt force trauma, taking place that utilize everyday household objects. It has also been highlighted in studies that blunt force trauma to the head is one of the most effective methods of murder, but that the weapons most commonly involved are hands and feet, also referred to as human strength.

This study is limited by the small sample size, but has provided information that could direct further research into violent assaults using blunt force trauma. It would be beneficial to repeat the study using a larger sample size, bone substitutes to more directly simulate the cortical biomechanics of a human skull, and by modifying the drop hammer to investigate how increasing the surface area impact will affect the results.

Reference: