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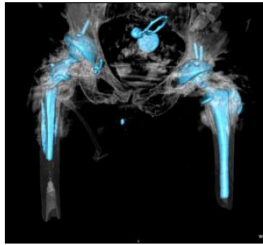
## Overview

The purpose of this project is to investigate the use of micro-computed tomography (micro-CT) to detect bomb fragments in human remains that have been exposed to a bomb blast. Using micro-CT, a three-dimensional (3D) internal image can be produced, allowing for projectiles, shrapnel, and bomb components to be visualized within the soft tissue.<sup>1</sup> During an investigation, identifying components of the explosive aids in crime scene reconstruction<sup>2</sup>, and in the case of terrorism, can also provide insight into the terrorist group responsible for the attack<sup>3</sup>. Finally, knowledge of the types and locations of bomb fragments, shrapnel, and debris within the soft tissue is useful for the forensic pathologist prior to autopsy.<sup>1</sup>

## What is Micro-CT?

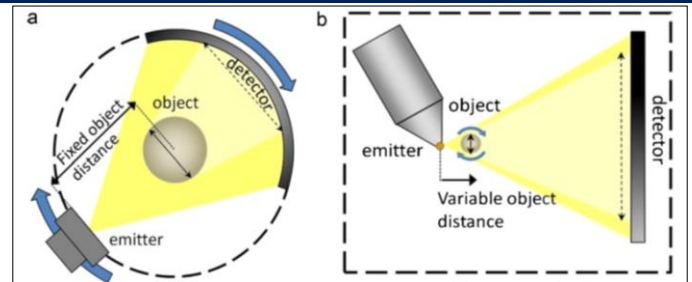
- ❖ Non-invasive procedure for internal imaging.
- ❖ X-rays are taken from multiple views, allowing for a 3D internal image to be created<sup>4</sup>.

**Radiodensity:** The attenuation of x-rays through a material<sup>1,4</sup>; dictates how opaque or translucent an object appears in the scan.



**Figure 1** – A CT scan of an individual with prostheses that can be identified within the bone due to differences in radiodensity.<sup>5</sup>

Source: O'Donnell et al., 2011

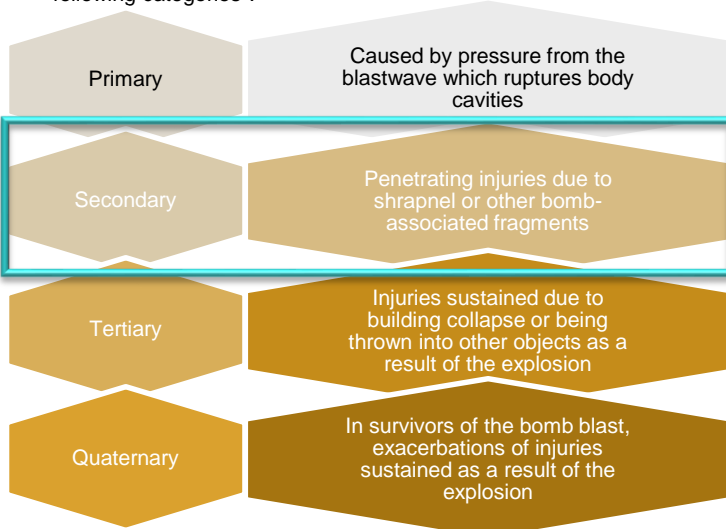


**Figure 2** – (a) In a conventional CT scanner, the beam emitter & detector rotate around an object; (b) In a micro-CT scanner, they are fixed and the object instead rotates, allowing a higher resolution to be achieved.<sup>4</sup>

Source: Ruttly et al., 2013

## What Happens in an Explosion?

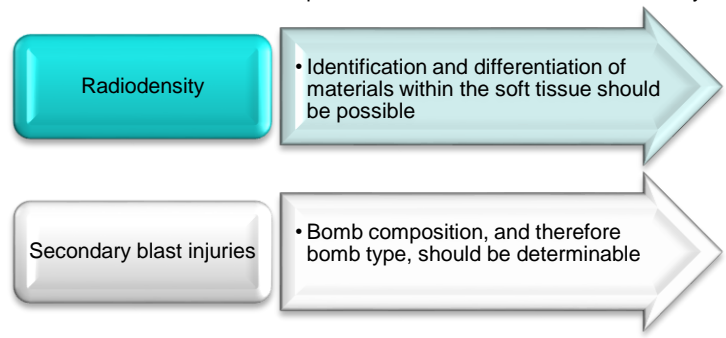
- ❖ Blast injuries sustained from any explosion can be classified into the following categories<sup>6</sup>:



**Bomb fragments left in soft tissue can therefore be used to characterize the bomb type.**

## Predicted Results

- ❖ Given that bomb components, shrapnel, and debris are expected to be variable in material composition and therefore also in radiodensity:



## Potential for Future Research

If the spatial distribution of bomb fragments seen within the soft tissue is combined with the spatial distribution of body parts at the scene, it may be possible to calculate the position and orientation of objects and people prior to the bomb blast. This would aid in reconstructing the crime scene and assisting investigators in determining the location of the blast origin.

## References

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## Additional Information

To learn more about this project and the INTREPID Forensics programme, visit: <http://www.intrepid-forensics.eu/project-9>

