



D2 An Army Forensic Puzzle Solved

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After attending this presentation, pathologists, forensic nurses, and investigators will learn how to recognize the characteristic markings on the chest made by implementation of the First Access for Shock and Trauma (FAST-1) intraosseous infusion system used by emergency medical personnel for rapid sternal intraosseous infusion.

This presentation will impact the forensic community and/or humanity by educating forensic nurses, pathologists, and investigators to be able to identify this type of wound pattern should they encounter it in the future.

During an attack on U.S. forces in Iraq, a soldier died of wounds that were first thought to have been caused by a shotgun blast. At autopsy, numerous round steel pellets and minute pieces of olive green plastic were removed from the victim's body. In addition, a circular pattern was noted on the victim's chest and a metal device was found under the skin in the center of the patterned impression. These items of evidence and images of the chest impression were submitted to the U.S. Army Criminal Investigation Laboratory for examination in an attempt to determine the source of origin for the pellets, plastic, metal device, and patterned impression.

The steel pellets and olive drab plastic were ultimately determined to be consistent with the types of materials used as the shrapnel and casing, respectively, for foreign anti-personnel hand grenades. This determination was supported by the presence of blast injuries suffered by the victim. But what was the cause of the circular pattern noted on the chest and what was the source of the metal object under the skin in the center of the pattern?

In an attempt to answer these questions, images of both the impression and the metallic device were posted on an Internet users group composed of individuals interested in forensic science applications of scanning electron microscopy. Though the web site is geared towards electron microscopy, perhaps some member of the group might recognize the pattern and metal object.

As a result of having cast a wide net, the answer to these questions quickly arrived. Susanna Rudy, a Registered Nurse, was serving as an intern in the Naval Criminal Investigation Regional Forensic Laboratory in San Diego as she worked on research for her MS in forensic science from National University in San Diego, California. Having read the scenario that accompanied the posted images, she e-mailed the images to her friends in the emergency medical field. Gary M. Vilke, MD and Associate Professor of Clinical Medicine, Medical Director, San Diego County Emergency Medical Services, responded: "The star pattern over the sternum with a central metal hollow tip makes it look like the tip of an intraosseous injection device. The FAST-1 intraosseous injector is utilized for sternal intraosseous infusion and has a threaded external end so that one can use a threaded removal device to extract the metal phalange after use (apparently not in this case)." Confirmation came from Michael W. Jacobs, Chairman/Founder, Pyng Medical Corporation, makers of the FAST-1 System.

FAST-1 Intraosseous System, Forensic Autopsy, Death Investigation