G64 Independence Day Explosion on Lovers Key

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After attending this presentation, attendees will have an understanding of the unique aspects and hazards involved in the investigation of the scene of a pyrotechnics explosion and in the postmortem examinations of the victims.

This presentation will impact the forensic community and/or humanity by providing an understanding of the unique considerations and hazards that should be taken into account by medicolegal death investigators and forensic pathologists involved in the investigation of deaths due to fireworks-related incidents.

Fireworks, generally recognized as having originated in China, have been popular in the United States since the mid-19th century. They are traditionally used in the celebration of Independence Day on Fourth of July, as well as other holidays. Because injuries due to recreational fireworks- related incidents among consumers are relatively common, the sale of fireworks is regulated by federal law and is also limited by state and local laws. Most injuries occur in children and in individuals actively handling the fireworks and most commonly involve the hands, face and eyes. In contrast, because fireworks display companies are under tight safety regulations, explosions in the professional pyrotechnics industry are rare.

This study investigated the scene and postmortem examinations of the victims of an explosion and resulting fire that occurred on Lovers Key in southwest Florida while a pyrotechnics crew was transferring fireworks from a semitrailer to a smaller truck in preparation for a Fourth of July display. The company had planned to use 853 fireworks shells ranging 3- to 12-inch in diameter and up to 4 feet long. The scene investigation involved eight teams of 80 people from multiple agencies, including the local fire department, the State Fire Marshall's Office, the Sheriff's Office, the Regional Bomb Squad, the Bureau of Alcohol, Tobacco, Firearms and Explosives, OSHA and the Medical Examiner's Office. The 40 hour investigation of the scene presented unique hazards because of flare-ups of the fire, a secondary explosion and because the debris included live firework shells. The potential detonation of live ordnance necessitated leaving the bodies at the scene until a thorough search was performed. The live rounds were marked and left in place until they were later secured in wet sand for removal and destruction. The investigation subsequently determined that the explosion was due to the accidental ignition of the fireworks, although the exact cause was never identified.

Four of the six members of the fireworks crew died at the scene, and later another later succumbed to thermal injuries. Two of the bodies at the scene were relatively intact, while the other two were fragmented. The sixth worker, a woman who was the farthest away from the trucks, jumped into a nearby body of water and survived although she suffered burn injuries and smoke inhalation. The identification of the decedents was made either by dental comparison and/or the comparison of pre- and postmortem radiographs of the axial skeletons. The autopsies also involved unique considerations due to the possible presence of unexploded ordnance in the bodies, necessitating total body radiographs prior to the examinations, because of the possibility of friction causing the detonation of these rounds. Injuries included thermal injuries resulting from the fire as well as blunt force injuries caused by the exploding fireworks and by structural materials from the destroyed vehicles. The two relatively intact bodies showed penetrating wounds, predominately superficial, containing fireworks pellets and dark burning soot. There were no characteristic injuries to air-containing hollow viscera due to shock wave effects.

Fireworks, Explosion, Fatality

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