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### **E22 The “Spaghetti Bullet”: Difficulties Inherent in the Medicolegal Investigation of Deaths Caused by Non-Standard Ammunition**

*Lindsey A. Bayer, MS\*, 809 Pine Street, Leesburg, FL 34748; Brett E. Harding, MBA, District 5 MEO, 809 Pine Street, Leesburg, FL 34748; Wendy A. Lavezzi, MD, Office of the ME, District 5, 809 Pine Street, Leesburg, FL 34748; and Barbara C. Wolf, MD, District 5 MEO, 809 Pine Street, Leesburg, FL 34748*

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After attending this presentation, attendees will understand the importance of forensic investigators and medical examiners being familiar with non-standard ammunition and firearms that they may encounter in medicolegal death investigations.

This presentation will impact the forensic science community by familiarizing forensic scientists and investigators with the importance of the multidisciplinary investigation in the medicolegal evaluation of deaths associated with firearms, particularly those involving atypical ammunition and/or weapons.

A wide variety of firearms ammunition is commercially available; however, many types of the ammunition are no longer being manufactured but can still be found in private collections and stockpiles. Knowledge of the composition and morphology of non-standard ammunition is essential for forensic investigators and pathologists, since these rounds are sometimes encountered in medicolegal death investigations. Similar to home-made ammunition, the interpretation of the morphology of the wounds caused by such rounds as well as the radiologic findings can be difficult for unfamiliar examiners. The following case illustrates these potential difficulties.

A 62-year-old man who was staying at the home of a friend’s parents telephoned his ex-wife, with whom he had a contentious relationship, and informed her that he planned to kill himself. She then heard what she thought were two gunshots and the phone line went dead. She called the local sheriff’s office and a deputy responded to the residence where the ex-spouse was staying. The residence was locked, but the deputy obtained a key from a neighbor and found the man deceased on the garage floor with a pistol in his hand and a pool of blood around his head. Three suicide notes were found in envelopes on the kitchen counter. The decedent was a former police chief in another jurisdiction and had been a police academy instructor.

Examination at the medical examiner’s office revealed an intra-oral gunshot wound involving the posterior hard palate. No exit wound was found. Radiographs of the head showed the presence of two unusual radio-opaque densities over the cranial vault, in addition to multiple skull fractures. The recovered projectile, which had produced an incomplete exit perforation in the posterior midline of the skull, consisted of a gray metal structure that resembled a tangled ball of spaghetti. The deformed, copper-colored jacket of a medium caliber bullet was also recovered. The postmortem examination was otherwise remarkable only for severe coronary arteriosclerosis and postmortem toxicological studies were negative. The cause of death was certified as “gunshot wound of head” and the manner of death was suicide. Because of the unusual nature of the projectile, consultation was sought from several firearms experts. It was eventually identified as a round introduced in the 1990s as non-toxic, lead-free ammunition for use by law enforcement. This round, which consisted of a woven, multi-stranded, jacketed, frangible zinc bullet, was subsequently found not to meet Federal Law Enforcement Training Centers (FLETC) standards and its production was discontinued.

This case demonstrates the difficulties that may ensue in the medicolegal evaluation of firearm deaths when atypical ammunition, including outdated and home-made rounds, as well as unusual firearms such as zip guns and nail guns, are used and highlights the importance of the multidisciplinary investigation.

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#### **Firearms Deaths, Atypical Ammunition, Medicolegal Investigation**