



## Pathology Biology Section - 2012

### **G29 What Can a Cartridge Case Tell us When There is no Gun? Interpreting Extractor and Ejector Marks on Ammunition That has Been Inserted in a Gun but not Fired**

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After attending this presentation, attendees will understand that comparing spent cartridges with unfired cartridges found at the crime scene in cases of suspected murder is a nightmare even for an expert firearms consultant. To obtain a good, positive match in such cases, it is important not to confine the identification to a simple comparison but extending the analysis to other parts of the bullet.

This presentation will impact the forensic science community by showing that in many cases after shooting, a criminal may throw away or destroy the gun but often forgets unfired bullets at home that have at one time been inserted in the gun but not fired perhaps, on a whim or to check the correct function of mechanical devices, especially the loading and ejection mechanisms. This generally leaves marks on the cartridge (often very evident) caused by the extractor and ejector, but not by the firing pin, of course, that at most may leave slight signs that are useless in such a comparison.

This case reports a 34-year-old man involved with the “camorra” (a variety of mafia), was killed in a narrow but very crowded street in Naples. Several shots were fired by different guns. None of the people present were willing to testify but the presence of a well known “boss” at the crime scene at the time of the murder was confirmed. No gun was found at this criminal’s home but 23 unfired cartridges were found in a drawer, of the same caliber and brand as the spent cartridges found at the crime scene.

The man was convicted, and for this study, by surveying the evidence, obtained surprising results that demonstrated that the cartridges found at the suspect’s home were undoubtedly inserted in the weapon, never recovered, that had been used for the mafia killing two months before.

Beginning by examining the characteristics of the class of spent cartridges found near the victim; this examination was done with a comparison microscope. Even at first sight, the marks of the extractor appeared very distinct, and to vary very little from one cartridge case to another, whereas the ejector marks seemed less useful for comparison. Naturally, firing pin marks were not useful. The class and individual characteristics of all the cartridges, spent or not, were perfectly superimposable, as were the breech marks.

The results of this analysis are illustrated and discussed, specifying the potential and limitations of this type of investigation that has never previously been described in literature. It is believed this case may shed light on new possibilities in forensic investigations, which should be kept in mind as further elements to be used by trained experts, especially in cases with a shortage of evidence that otherwise often remain unsolved. In particular, strategies are proposed for resolving disagreements between experts and thus avoiding contention during the trial that may lead to an unsatisfactory conclusion. It should be kept in mind that considerable experience is required to recognize the true concordance of marks on spent and unfired cartridges, and differentiate them from accidental and not individual marks visible on extraneous cartridges.

**Firearms Investigation, Unfired Cartridges, Mafia**