H9 No Country for Young Pigs: Identifying the Use of Captive Bolt Pistols in Non-Natural Death Occurrences

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After attending this presentation, attendees will understand the similarities and differences in trauma to the skull resulting from gunshot wounds and wounds inflicted by a tool used in the slaughtering of livestock, the captive bolt pistol (CBP).

This presentation will impact the forensic science community by presenting the criteria for differentiating defects produced by handguns and the captive bolt pistol.

Case studies from Germany, Italy, and Serbia have shown that different varieties of the CBP have been used in suicides and homicides. While gunshot wounds (GSW) are much more common forensically in the United States, the wide availability of captive bolt pistols, found in commercial livestock slaughterhouses and many family farms, means these tools could be used as a weapon in a homicide.

In this study, skeletal evidence of gunshot wounds in the skulls of humans was compared to captive bolt pistol wounds in the skulls of domestic pigs (*Sus scrofa*) (n=6). A seventh pig (n=1) was observed for a month separately from the first group in an effort to determine if the wound sizes changes over time in an uncontrolled environment, exposed to the elements. The captive bolt pistol (CBP) produces a characteristic round, sharp-edged entrance wound with internal beveling that resembles a GSW entrance defect. The CBP entrance wounds were measured in an effort to identify the caliber of the weapon used (Ross 1996). While they were classified within the range of a large-caliber weapon, the CBP mean value of the minimum diameter (13.05 mm) was found to be greater than the large caliber GSW mean (11.004 mm). The values obtained when plugging into the Ross (1996) equation was 9.51, classifying it as large caliber. The individual measurements of the CBP entrance sites are all larger in diameter than the mean diameters for the selected small and large caliber weapons (.22, .25, .32, .38) found in Ross (1996). The size of the CBP bolt used (11.9 mm), is slightly larger than bullets from common-caliber handguns: 9 mm, .357 Magnum (9.07 mm), .38 Special & ACP (9.65 mm), .40 S&W (10.2 mm), .44 Magnum

mm), and .45 ACP & GAP (11.5 mm). While a large caliber value may indicate a captive bolt pistol, other characteristics that aid in differentiating the CBP wound from a gunshot wound include: (1) the absence of radiating fractures from the area of trauma impact; and, (2) the lack of an exit wound, as the CBP bolt does not travel through and exit the skull. Interestingly, previous research discovered that the wound size was equal to or slightly less than the diameter of the bolt (Simic *et al*. 2002). However, in this study, it was found that the wound defect sizes of bolted pigs were observed to be slightly larger than the 11.9 mm diameter of the bolt itself (mean diameter=13.05 mm). At this point, the resulting difference in size is still unaccounted for as the observed taphonomic processes do not appear to be actively modifying the cranial defects. More research will need to be conducted before a cause can be more conclusively determined.

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