



### G63 A Rare Injuring Tool in a Dyadic Death

*Sabina Di Donato, MD\*, Giovanni Paolo Di Peri, MD, and Carmina Dambra, MD, Institute of Forensic Pathology, University of Foggia - Italy, Ospedali Riuniti, Viale L. Pinto n. 1 - 71100 Foggia - Italy, Foggia, 71100, Italy*

After attending this presentation, attendees will have a better understanding of cases involving a homicide and suicide (HS). Only few cases of homicide-suicide by carpenter axe are reported in forensic literature. Sometimes it may be difficult for the forensic pathologist to distinguish between a real HS and a double murder. The importance of a thorough forensic investigation, including crime scene evaluation, analysis of circumstantial data, autopsy findings, toxicological analysis, histological and immunohistochemical studies is emphasized.

This presentation will impact the forensic community and/or humanity by presenting the case of a homicide-suicide, where the murderer chopped his wife with a carpenter axe, and then he hanged himself. The unusual injuring tool and the relevant injuries were studied and analyzed to approach the case of dyadic death. The confocal microscope was utilized to verify the three dimensional appearance of the cutaneous lesions

Homicide-suicide (HS) is defined as that lethal event in which an individual kills another and subsequently commits suicide within one week. International studies report a highly variable proportion of HS in all homicides (from 1.5% of all recorded homicides in USA, to 42% of Denmark). Some authors proposed that the higher is the homicide rate in a population; the lower is the rate of HS. Per capita rates of HS, instead, appears quite constant across different countries and through time, in fact the annual incidence varies from the 0.2-0.6/100,000 in US, 0.07/100,000 in England and Wales, 0.18/100,000 in Finland, and 0.22/100,000 in Hong Kong. In Italy, in an observational period of 15 years, 1985 – 1999 it has been observed that the higher rates concern the Northern Italy (0.85/100,000), followed by the Central Italy (0.68) and the Southern region (0.38). Previous studies have outlined that the HS perpetrators show more similarities with those who commit suicide rather than with those who commit homicide. The vast majority of offenders are male (75- 97%), aged 35-51 years, while the victims are generally female (60-85%), aged 30-35 years. Offenders are often apparently free of mental disorders, but some are regarded by relatives and friends as “hot tempered”; a low percentage have a diagnosis of major depression or psychotic disorder. The great majority of HS occurs between intimates (spouses and cohabitant) and family members. The largest group comprises the spousal or lover killing, followed by the homicide of children, and than of other family members. Male offenders usually kill spouses, while female perpetrators generally commit child homicide. The most frequent trigger is represented by the imminent separation or ending of an intimate relationship. Many modes of killing are described like shooting, strangling, stabbing, chopping, gassing, or poisoning, beating, etc. There exists a significant difference between male and female offenders in the method chosen to kill: in fact, while men are more prone to adopt active methods, women tend to use passive methods.

Here is a case of HS, where the husband chopped his wife at the back of the neck, resulting in a complete transection of the cervical spinal cord, and than hanged himself. A boy with a friend came back home and found the lifeless body of his mother lying face down in a large pool of blood. At a distance of two m, they saw the body of the father hanged by a strong nylon rope to the banisters of the mezzanine. Immediately they tried to help him, releasing his head from the slip knot, and called the ambulance, but they were both pronounced dead. In the adjacent room, policemen found a carpenter axe on a table, stained with blood and locks of hair. On the floor beneath the axe a large pool of blood was evident, with extensive blood spatter on the surface of the door and the adjacent wall. This pool of blood started a trail of blood terminating at the woman's body. The postmortem examination of the female deceased showed a deep linear cutaneous wound on the back of the neck, 6.5 cm in length, slightly oblique, with clear-cut divergent margins, exposing the underlying structures, with soft tissue bleeding underneath. A red colored area, 7.5 x 2.5 cm in diameter, surrounded this wound. The body of the second cervical vertebra showed a transverse fracture, passing underneath the dens and the right superior articular facet. The spinal cord was completely transected at the level of C<sub>2</sub>. Also a complete section of the left vertebral artery was visible. No relevant injuries were detected on the remained of the body. Autopsy of the male revealed a ligature mark on the neck. In both cases, the histological investigation revealed massive hemorrhages in the cutaneous and subcutaneous tissues. Infiltration of erythrocytes in the dural layers and in the spinal cord was evident, at the level of transaction of the spinal cord in the female victim. Immunohistochemical studies were performed on the cutaneous specimens collected from the neck lesions for the determination of the vitality. The evaluation of skin samples with confocal microscope allowed researchers to observe the three-dimensional model of the strangulation mark and the chopping wound. Toxicological analyses were negative.



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