



Case Report

An unusual case of “dyadic-death” with a single gunshot



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ARTICLE INFO

Article history:

Received 13 June 2014

Received in revised form 1 August 2014

Accepted 6 August 2014

Available online 15 August 2014

Keywords:

Forensic pathology

Suicide

Homicide

Gunshot

Computed tomography

Micro-CT

ABSTRACT

The terms “dyadic death” or “murder–suicide” refer to an incident where an individual commits homicide and then takes his or her own life. These events are generally committed by men within the family network, using firearms or sharp force instruments, and make up a relatively small proportion of homicides overall. Herein, we present the application of post-mortem multislice computed tomography (CT) and micro-CT analysis to an unusual case of dyadic death, where a 38-year-old man fired a single gunshot to his own right temple, killing himself and his 50-year-old wife, lying on the bed beside him.

The integration of radiological, autopsic and histological data allowed us to reconstruct the trajectory of the gunshot, the most probable dynamics of the event, and to classify the incident as a “suicide–homicide”, because the female victim died a few minutes later than her husband and murderer.

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1. Introduction

The term “homicide–suicide”, also called “murder–suicide”, “extended-suicide” or “dyadic death”, refers to an incident where an individual commits homicide and then takes his or her own life [1,2].

The rate of murder–suicides occurring around the world ranges from 0.02 to 0.46 per 100,000 population per year, with significant national and regional variations [1–6].

The rate is higher in the US (0.22–0.46 per 100,000 population per year) [6] than in Europe (0.05–0.16 per 100,000 population per year) [2], with the lowest prevalence registered in the Netherlands, Greece, England, Italy (0.03–0.07 per 100,000 population per year) [2,4,5] and Japan (0.02–0.06 per 100,000 population per year) [7,8].

Homicide–suicides are predominantly committed by men (80–90%) [2,5], and generally occur between intimate partners and family members [1]. The majority of these incidents involve firearms (i.e. handguns, shotguns and rifles), followed by sharp

force instruments, strangulation/suffocation, and carbon monoxide poisoning [1–8].

Herein, we present a singular case of “dyadic death”, where a 38-year-old man fired a single gunshot to his own right temple killing himself and his 50-year-old wife, who was lying on the bed with him. Death scene investigation, criminalistics analysis, and medico-legal findings (post-mortem imaging, autopsy, and histology) allowed us to reconstruct the trajectory of the gunshot, the most probable dynamics of the event, and to classify the incident as a “homicide–suicide”.

2. Case report

2.1. Death scene investigation

When a 38-year-old policeman did not arrive at work and could not be reached by telephone, two colleagues suspected an accident and entered his house opening the door with a spare key. In the bedroom, they found the man lying lifeless on the right part of the bed in a supine position, and the corpse of his 50-year-old wife resting in a lateral position on the left part of the bed (Fig. 1). Due to the presence of hypostasis and rigour mortis on both bodies, no

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Fig. 1. Death scene at the arrival of the police; the man lying lifeless on the right part of the bed in a supine position, and his 50-year-old wife resting in a lateral position on the left part of the bed. In the box: self-loading Glock pistol, mod. 17 Austria 5180, cal. 9 mm, found between the two corpses near the left forearm of the man, with the upper part of the barrel placed upon the bed.

resuscitation attempts were made and the death scene remained unchanged until the arrival of the scientific police and of the medico-legal expert. A self-loading Glock pistol, mod. 17 Austria

5180, cal. 9 mm, was found between the two corpses near the left forearm of the man, with the upper part of the barrel placed upon the bed (Fig. 1, box). On the floor, at the right side of the bed, a single brass-coloured cartridge case ("9 mm × 21 CBC") of a full metal jacket ammunition was identified and collected. Police investigations highlighted that, since a couple of months, the woman had started an extramarital relationship with a colleague. The husband discovered this relationship two weeks before the incident and the same day of the murder he wrote a telephone message to his wife's lover saying "I'll never let you take her away from me".

2.2. Postmortem computed tomography and forensic autopsy

An unenhanced whole body post-mortem computed tomography (CT) was performed on both corpses 12 h after death, using a 64 multi-slice scanner (SOMATOM Sensation 64, Siemens Medical Solutions, Forchheim, Germany) with the following parameters: 120 kV, 200 mAs, 0.6 mm collimated slice, 1.0 s rotation time. Forensic autopsies were performed 30 h after death.

In the man's right anterior temporal region, a 1.7 cm wide irregularly round-shaped skin defect with blackened margins was observed (entrance wound; Fig. 2a). Beneath the skin and subcutaneous lesions, in the temporal fossa, a 2.2 cm wide round bone defect with internal bevelling and numerous bone fragments were identified. In the skullcap surrounding the entrance wound radial and circular fractures were found (Fig. 2b), some of which running through the bony skull base; the sagittal suture showed a significant diastasis. Along the bullet track, with right-left, down-up and antero-posterior direction, metal fragments were both radiologically and macroscopically visible. In the left parietal bone, a 2.5 cm round bone defect with cone-shape external bevelling and extra-cranial bone fragments was detected (Fig. 2e). At the skin

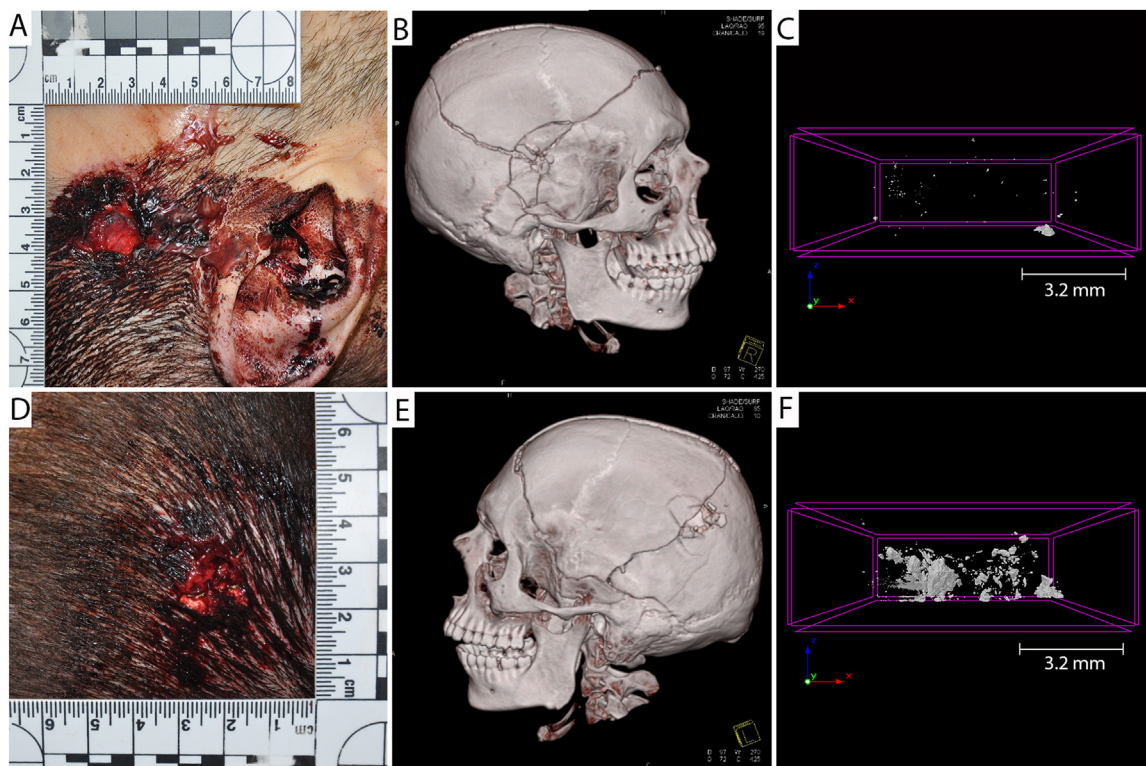


Fig. 2. Male victim: autopsy, imaging and microCT results. (A) Entrance wound at inspection; (B) 3D-CT reconstruction of the entrance wound; (C) microCT analysis of the entrance wound (volume of interest focused in the centre of the specimen, side 10 mm, height 3.2 mm); (D) exit wound at inspection; (E) 3D-CT reconstruction of the exit wound; (F) microCT analysis of the exit wound (volume of interest focused in the centre of the specimen, side 10 mm, height 3.2 mm).

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