



An unusual unplanned complex suicide by arm cutting, poisoning, and self-immolation

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ABSTRACT

Different methods of suicide, when combined with contamination of the scene, increase the difficulty of interpreting the dynamics of an event. In the presented case, the discovery of a corpse with widespread burns, singed hair, an “X”-shaped cut on the arm with a weapon distant from the body, and the death scene significantly altered by subjects with psychiatric disorders raised the hypothesis of murder in the initial phase. However, the integration of the death scene investigation with medicolegal, toxicological, and radiological analyses allowed for the identification of an unusual unplanned complex suicide by arm cutting, poisoning, and self-immolation.

Introduction

Contamination of a death scene, whether voluntary or more frequently involuntary, increases the difficulty of interpreting the dynamics of the event [1]. Interpretation is even more difficult in cases of complex suicide when a combination of methods used is rare [2].

The authors present a case of complex suicide by arm cutting, poisoning, and self-immolation. The interest of the case lies in the rare methods used and the difficulty of evaluating a complex and contaminated death scene. Therefore, this case is a paradigmatic example of the need for a multidisciplinary approach. Death scene investigations must be integrated with medicolegal, toxicological, and radiological analyses.

Case report

Examination of the scene

In a small village at the foot of a mountainous area, the corpse of a 67-year-old woman was found at the entrance of her home with numerous burn injuries and an “X”-shaped cut on her left arm.

There were numerous blood traces in the form of drip stains, blood spatters, and swipe patterns, along with signs of numerous people having walked on the floor at the entrance and in the rooms adjacent to the entrance (kitchen and woodshed). There were also burned materials

and liquids on those floors. A watering can and an overturned chair without a seat were found close to the corpse. Additionally, there were signs of blackening (with the morphology shown in [Photo 1](#)) on the wall in front of the entrance.

A kitchen knife stained with blood was found in the woodshed along with other significant objects: a partially empty container with liquid that smelled like fuel and an overturned chair with a partially burned seat and blood drip stains. An almost empty ethyl alcohol container was found in a small living room next to the hallway. Unfortunately, the police did not investigate the type of liquid found in fragments of burned fabric or in other places in the house to determine the accelerant used.

The corpse lay naked in the supine position with a religious booklet on her chest and a rosary on her abdomen ([Photo 2](#)). Some cushions and fragments of burned fabric were found close to the corpse near her upper and lower limbs.

Circumstantial and testimonial data

The woman’s family was socially disadvantaged. Their background included the previous suicide of one son and two other sons with schizophrenia. The police were already aware of previously iterated threats from one of the sons to the rest of the family. On the day of the event, the two remaining sons were reported to be upstairs, with one resting in his room and the other listening to loud music. According to

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Photo 1. Signs of blackening on the wall, body covered with a sheet.

declarations, the woman was found by her husband to be engulfed in flames while sitting on a chair in front of an image of Jesus. Subsequently, the husband began screaming for help and alerting the son who was listening to music. The rescue service was alerted. Before the police arrived, a priest was called by one of the family members. The priest reportedly put the religious booklet and the rosary on the corpse before the rescue intervention. Upon the police's arrival, one of the sons reported that he had previously moved a partially burned chair to the woodshed because it "bothered him."

Radiological, necropsy, and toxicological data

The total body CT was negative for traumatic injuries. An external examination revealed second- and third-degree burn lesions affecting about 90 % of the body's surface and singed hair. An "X"-shaped cut was detected at the left elbow fold, and the edges of this lesion were infiltrated with blood. The external examination showed no findings that could be related to self-defense or an action performed by another person, such as immobilization or grabbing. The cadaveric section of the upper and lower airways showed blackened mucosa. Cardiomegaly, coronary atherosclerosis, and left ventricular hypertrophy were present. Histological analysis revealed emphysema, pulmonary congestion, and myocardiosclerosis.

Chemical-toxicological analyses showed the presence of ethyl alcohol (blood 0.67 g/L, urinary 0.93 g/L), levomepromazine (125 ng/ml and 280 ng/ml), and sertraline (181 ng/ml and 560 ng/ml). There was no carboxyhemoglobin.



Photo 2. Body at the death scene.

Cause of death

The cause of death was acute cardiovascular insufficiency from toxic-hypovolemic shock from second- and third-degree burns on more than 80 % of the body's surface, ischemic heart disease, and chronic pulmonary emphysema. The exclusion of a causal role of xenobiotics (i.e., ethyl alcohol, levomepromazine, and sertraline) in the woman's death was determined by blood concentrations of those substances being insufficient to cause death.

Manner of death and dynamics

The manner of death was established as suicide based on the integrated evaluation of available data.

Circumstantial data highlighted a difficult life situation. The testimonial data were consistent with a clumsy attempt to put out the flames. The circumstantial data indicated that the woman was in a sitting position with her head resting on the wall, which was consistent with the testimonial reports.

The radiological data excluded injuries capable of causing or contributing to death or suggesting a fight with third parties. The necroscopic data showed localization of a cut in a region frequently attacked for self-injurious purposes and easily reachable by the woman herself. Signs of immobilization were excluded.

Chemical-toxicological analyses supported the thesis of a suicidal intention that was pursued through the simultaneous intake of drugs and alcoholic substances. Drugs prescribed for the treatment of mood, anxiety, and schizophrenic/paranoid/manic disorders were detected in the subject, who was not on psychopharmacological treatment. The drugs were taken with a significant amount of alcohol. The interruption of the absorption of drugs due to death would justify the failure to find higher drug concentrations, as hypothesized in the event of suicide.

The chronological sequence of events is hypothesized below.

The cut was self-produced *intra vitam* before the flames developed. The vitality of the lesion was evident. Regularity excludes self-production in a subject engulfed in flames.

According to the blood stain pattern, it is likely that after self-inflicting the stab wound, the woman wandered the ground floor of the house until she reached the woodshed, where she may have gotten the container with flammable liquid. She doused herself with flammable liquid in either the kitchen or the woodshed and then moved into the hallway, sitting under the picture of Jesus. Blood drips and swipe patterns were found in the kitchen and in the hallway, heading in the direction of the woodshed; more blood stains were detected from the woodshed to the corridor.

The woman probably sat on the chair under the sacred effigies in the entrance corridor. The reconstruction of this last phase is supported by traces of combustion left on the wall in front of the entrance door. The aforementioned traces matched the woman in width and height from the ground sitting on a chair placed near the wall.

Discussion

Complex suicides are committed using more than one method and represent less than 5 % of all suicides in forensic literature [3–5]. The complexity of death scenes in such cases creates investigative challenges for forensic pathologists. To achieve complex suicide, the victim may plan to use multiple methods, either simultaneously or consecutively, to increase the possibility of dying. If the victim has not planned the action, the employment of multiple methods can be the consequence of different consecutive choices made to accelerate death and/or reduce pain/relieve the anguish of committing the act [6]. Victims tend to apply less lethal methods before switching to a more lethal approach [7].

Combinations of common methods in complex suicides classify them as typical. Conversely, combining three or more methods and/or the employment of infrequent methods classifies complex suicides as atypical [3,8,9]. Atypical suicide combinations include fire and sharp force injuries.

In planned complex suicides, victims simultaneously employ two or more methods to accelerate death and/or reduce survival chances. Additionally, there are common patterns, such as drug ingestion along with hanging or the use of firearms in association with drowning and falling from heights.

Unplanned complex suicides are usually improvised after a first attempt did not cause death rapidly enough or proved to be extremely painful. Methods are primarily chosen based on their availability in a specific situation and setting. In unplanned complex suicides [4], wrist cutting is often the first attempt to inflict mortal self-injuries before switching to more effective methods. Due to the consecutive employment of improvised methods, unplanned suicides are characterized by the application of three or more methods [10]. Self-immolation is rarely combined with other suicide methods [11], but it is a relatively common method in simple suicides [12,13]. Among cases of complex suicide with self-immolation, victims' histories show an increased percentage of psychiatric disorders [4,7,14], and that percentage is even higher in cases involving sharp force injuries [15].

In this case report, the complex suicide combination included xenobiotic intoxication, a cut injury to the left elbow fold, and self-immolation. The presence of at least three methods indicates that suicide was probably unplanned and atypical. The cause of death was the acute consequences of burns on most of the body. Therefore, self-immolation can probably be classified as the last attempted and most effective method of suicide.

In many fire-involved suicide scenes, it is initially suspected that the deceased was a victim of a violent crime, [16] as in this case. Fire is often employed by murderers as an attempt to cover their crimes [17–19], and it is even more suspicious when victims have additional wounds, such as gunshots or cuts [20]. Therefore, a fire death scene must be carefully

analyzed with the aim of differentiating between self-inflicted and hetero-inflicted injuries.

Investigation of the type of fire accelerant used, which was unfortunately not carried out in this case, is an important aspect of analyzing a fire death scene because it could provide elements that are useful for understanding the dynamics of the event. When combined with toxicological analysis, this information can help determine the cause of death [21,22]. The type of fire accelerant used could suggest combustion processes, flame structure, and flame temperature. These elements, when combined with the analysis of the environment, the clothing, and the body, could suggest where and when the accelerant was poured (or self-poured) [23]. Regarding the cause of death, knowing the type of accelerant is useful when the other available elements (necroscopic and toxicological) are uncertain (e.g., low levels of carbon monoxide in the blood and no significant antemortem fire damage are detected in the victim [22]).

Even though the liquids found on the scene were not analyzed for type, it is probable that a fire accelerant was used. The almost complete burning of the clothing, the singed hair, and the blackened wall support the hypothesis of a fire accelerant being used.

Overall, the available data provided sufficient information to discuss the dynamics of the event, rule out the hypothesis of a homicide, and define the cause of death.

The finding of blackened mucosa in the upper and lower airways due to smoke inhalation is a clear and classic sign that the woman was alive when the fire was set [21]. In this case, the credible employment of liquid fire accelerants could have even generated a flashfire, resulting in rapid death due to lesions and eventually to laryngospasm/bronchospasm in response to the inhalation of scalding air. This is quite typical when liquid fire accelerants are involved [22]. Another factor to consider is that the total body surface area involved in self-immolation victims has been shown to be higher than that seen with assaults [24].

Therefore, a death scene examination should be performed with extreme attention when complex suicides occur, and external handling or contamination should be avoided.

The same must be asserted concerning blood patterns. Death scene contamination could lead to the destruction and/or alteration of important evidence that could hinder the investigator's tasks. In the abovementioned case, the police force attested to multiple death scene contaminations. The blood on the floor was partially adulterated due to the passage of people (and probably the victim) on the scene. A partially burned chair was moved away from the death scene and carried to the woodshed. A bloodstained knife and an empty container allegedly containing fuel for a chainsaw were found in the woodshed. Finally, a priest entered the death scene before the police arrived, leaving a religious book on the woman's body and a rosary in her hands. These contaminations led to major difficulty in examining the scene and made the investigation more difficult for the police and the forensic doctor.

A carefully integrated evaluation of the available data ruled out any criminological hypothesis of the events with high probability and without the need for further analysis.

In conclusion, this paper presented a complex suicide with a combination of arm cutting, poisoning, and self-immolation. Difficulties in the interpretation of the case were due to the complex death scene. This case shows that death scene investigations must be integrated with medicolegal, toxicological, and radiological analyses.

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Declaration of Competing Interest

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