Case report

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Multiple stab wounds: understanding the manner of death through the psychological autopsy

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Abstract

A 48-year-old physical therapist with no history of psychiatric disorders or suicidal tendencies was found dead by his relatives inside his apartment. Multiple stab wounds were present on the chest and the abdomen. Several more superficial cuts were also seen on the neck and the left wrist. At the death scene, there was a large pool of blood in the room, with secondary droplets and stains; a kitchen knife was found beside the body, and a suicide note on a table. Especially the number of wounds raised strong suspicion of a homicide in the first instance but some circumstances (the farewell letter, the absence of clothing injuries, no signs of third-party involvement) and autopsy findings (absence of defense or blunt injuries, the localization of the wounds, the presence of hesitation marks) pointed toward a suicide etiology. Because of the many stab injuries and the lack of a psychiatric history, further forensic investigations were required including a so-called *psychological autopsy*. This case report highlights that only a comprehensive interpretation of all the elements (circumstances, the scene of death, autopsy findings, and psychological autopsy) can lead to the correct solution of atypical cases of suicide. ***Clin Ter 2017; 168(4):e233-239. doi: 10.7417/CT.2017.2012***

Key words: *crime scene investigation, multiple stab wounds, psychological autopsy, suicide*

Introduction

One of the main issues in forensic pathology is differentiating between self-inflicted injuries and third-party involvement (e.g., manslaughter, homicide). The literature notes several factors that are vital for making this determination: the crime scene, anatomical findings include the site/number/characteristics of the wounds, the presence of hesitation or defense wounds, clothing defects, autopsy findings and the psychiatric history (1, 2).

However, the differential diagnosis can be very difficult, especially in the presence of ambiguous or contrasting findings in the same case, some more typical of murder and others more frequent in suicide (3-5).

When the forensic pathologist is faced with a case of violent death, especially with blood on the scene, several elements must be considered to solve the case. Among these are the findings derived from the death scene investigation, laboratory analyses, and autopsy findings (6).

Fatalities due to sharp force are more frequently homicidal, whereas they account for only 2-3% of suicide means (7). In the latter, the frequency of multiple stab wounds is not concordant in the literature: in an Australian study (8) only 15.7% of suicides using a sharp weapon showed multiple wounds, whereas in a Japanese series (9) the frequency was 70.8% and a German study (10) reported a similar proportion. More than fifteen stab wounds is uncommon (9), however there have been cases reporting more than ninety wounds (11, 12).

Case report

A 48-year-old man, a physical therapist, was found dead in the bedroom of his seaside house by his wife in the late afternoon hours. The body was lying in prone position on the floor in a pool of blood, fully clothed with the shirt opened on the chest. The police investigators and forensic pathologist were called to the death scene on the strong suspicion of a homicide. The external examination revealed multiple stab wounds on the chest and abdomen; other cut wounds on the right side of the neck and on the left wrist were found. A kitchen knife with blood traces was found close to the body. There was a large mirror on the wall in front of the location where the victim was found. The crime scene investigation revealed blood traces on one side of the bed cover, droplets of blood on the floor, the stairways and the sink, determined to be caused by the wife washing her hands after she touched the body. The presence of blood traces on the knife hilt and blade made it impossible to detect fingerprints. A farewell note was found on the table, in which the victim apologized for the troubles and suffering he had caused to his family and other loved ones. Based on the results of the police investigations and circumstantial

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data about the last time the decedent had been seen alive, the postmortem interval (between the time of death and crime scene investigation) was established to be approximately 10 (±2) hours, which correlated well with the presence and intensity of postmortem lividity, postmortem rigidity, and the rectal temperature.

The wife reported that her husband had been romantically involved with a nurse who worked with him. He had told her that he was very worried because the nurse had made death threats when he ended the relationship. Few hours before her husband was found, the wife had called the nurse to reproach her for the affair. After the call, the wife had had an argument with the man and he had retreated to their seaside home. Later, the nurse and her new boyfriend arrived there and threatened him, complaining about the wife's phone call. Witnesses reported hearing dull noises coming from the house during this time. After that, the couple went away quickly.

Autopsy findings

The external and internal examination confirmed 35 sharp wounds, cuts and hesitation marks (Fig. 1) localized as follows:

- Neck, 5 hesitation marks (Fig. 2): 4 cutting wounds on the right side, behind the angle of mandible; 1 small stab wound penetrating only the skin close to the chin;
- Left wrist, 4 hesitation marks: 4 trial cuts on the flexor surface, limited to the skin;
- Chest, on the left side, 12 stab wounds (Fig. 3a): 4 penetrating wounds (2 through the III intercostal space → mediastinum, depth of thrust 11 cm; 1 through the IV intercostal space → left lung → pericardium, depth of thrust 15cm; 1 through the VI intercostal space → pericardium → right heart ventricle, depth of thrust 10 cm); 4 wounds limited to muscles and osteo-cartilaginous tissues; 4 small stab wounds (hesitation marks);
- Abdomen, 14 stab wounds (Fig. 3 b): 10 communicating with the cavity (3 on the right hypochondrium; 1 on the right close to the umbilicus; 1 in the epigastric area; 4 on the median area close to the left hypochondrium; 1 on the left hypochondrium); 4 small stab wounds (hesitation marks), limited to the skin (2 on the left side; 2 on the right side).

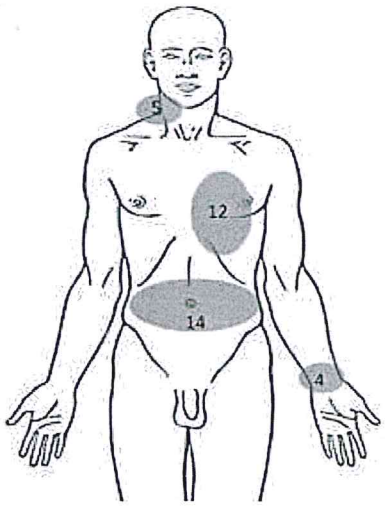

Fig. 1. Sketch depicting the number and sites of the stab injuries.

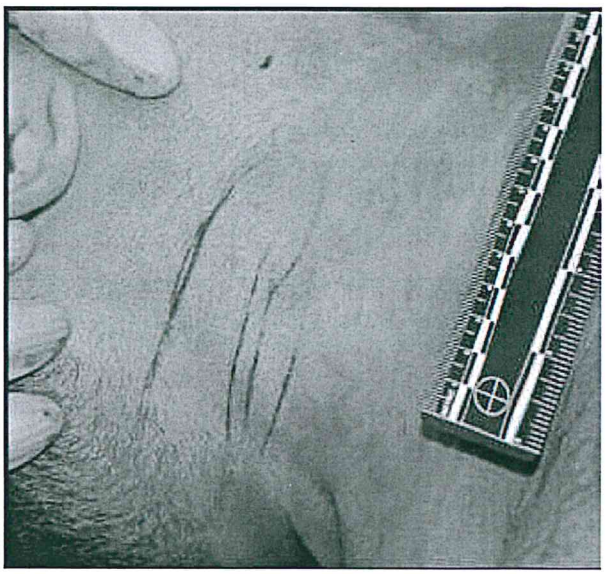

Fig. 2. The neck with the hesitation marks.

The stab wounds had a single pointed end and showed a unilateral "fish tail" split due to the blunt back edge on the knife blade. These characteristics were related to a knife with a single sharp edge; this was consistent with the knife found on the crime scene (a single sharp edge with a squared – off back; length 19 cm, thickness on the back 1 mm; maximum width 3.2 cm). All the stab wounds were made with a downward direction of the thrust; the abdominal wounds and some of the thoracic defects showed that the pointed end was turned toward the left side. The pointed end of the blade was turned toward the right side of the body in only 4 of the wounds (including the lethal cardiac wound). None of the abdominal wounds were lethal. The cuts on the neck were directed from posterior to anterior side; those on the wrist were directed from the radial to the ulnar margins. Toxicological examination was negative. The cause of death was massive blood loss due to multiple stab wounds.

Psychological profile

The victim's psychological profile and psychiatric history were investigated by forensic experts including a forensic nurse, a psychologist and a psychiatrist.

Information was collected from relatives (firstly victim's wife and daughter) and friends via semi-structured interviews based on the model proposed by Ebert in 1987 (13). The items of the interview included investigating categories on family environment, victim and family history, socioeconomic status, health condition, and psychiatric diagnosis. This standardized questionnaire provided an important source of information useful in understanding the manner of death.

Table 1. Checklist of items used in psychological autopsy.

A) History of alcohol consumption	Family and victim history of alcohol use and abuse; Regularity of its ingestion; Difficulties related to alcohol consumption (particular behavior, problems with family members and friends, or at work);
B) Handwritings strongly indicative of suicide intent	Content; Style; Graphology;
C) Notes or documents	Past writings from the deceased before death (personal diary, notes, papers, etc.).
D) Books	If the victim was reading books about the occult, death, life after death, religious items or, more specifically, books about the suicide.
E) Relationship	What people who have met the victim (including close friends, parents, relatives, doctors, and work colleagues) knew about him; The point of view of the deceased about the death; Relationship of the victim with children; If the victim hated anyone in particular; Extra-marital relationships.
F) Mood	Mood fluctuations especially in the last days of victim's life; Symptoms of depression.
G) Psychosocial stressors	Recent loss (deaths of people or pets); Divorce or other meaningful breakup; Loss of job; Legal and/or financial problems; Reaction to stressors; Relocation.
H) Educational history	Level of education; Conflicts with teachers or classmates.
I) Military history	Punishments and difficulties during the military service; Signs of post-traumatic stress disorder; Staying in a combat zone; Decorations or award.
J) Behavior in proximity of the death	Events during the days preceding the death; Detailed account of movements and activities of the victim; Payment of debts; Donation or giving important possessions; Stipulation or changes of will; Sudden and unexpected reorganization of things concerning the deceased; Special attention to victim's children or pets.
K) Language	References to death by the deceased.
L) History of medication or drugs consumption	If the victim was taking medication or drugs and which one and when; Any addiction.
M) Medical History	All medical records and details of any previous examinations; Records pointing toward terminal diseases or serious disabilities.
N) Mental state before death	Orientation; Memory; Warning; Concentration; Hallucinations; Delusions; Language; Judgment.
O) Psychological and psychopathological history	Suicide attempts (type, method); Major mood disorders (major depression and bipolar disorders), schizophrenia, borderline syndrome; Psycodiagnoses; Impulsive behaviors; Admissions to psychiatric facilities.
P) Family history	Relationships of the victim with family members; Socio-economic status; Family conflicts before death; Whether family members have ever committed or attempted suicide (method).
Q) Employment history	Number and kind of work performed by the victim (the choice of works with high risk of loss own life may indicate underlying self-harm); Relationship with colleagues and superiors; Failures; Disciplinary actions against the deceased; Promotions or reductions in responsibilities.

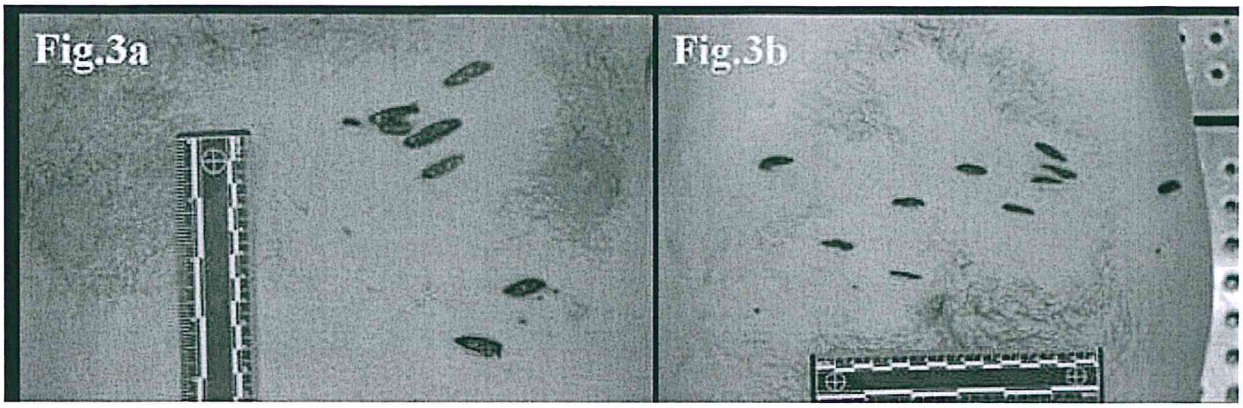

Fig. 3. a) Stab wounds of the chest: 4 penetrated the thorax, 4 were limited to subcutaneous tissue, and 4 were hesitation marks; b) stab wounds of the abdomen: 10 penetrated the cavity, 4 were small hesitation marks.

The checklist of items used in psychological autopsy included the assessment of the points listed in the Table 1.

According to the family members, the man did not suffer from any physical or mental disorder and was not taking any medication. He was well known as a friendly, very professional and active man. The relatives described him as a gentle person, a peacekeeper, and caring towards his wife and daughters. He loved his family and friends and had a healthy lifestyle. He became anxious and dispirited when he confessed his love affair and talked about the threats he was receiving. The month before he had gone on a cruise with his family, during which he was his usual funny self. But after his return, just few days before the death, he became anxious again and very troubled by what the lover had said about him and his private life.

The nurse and his boyfriend admitted they had been at the scene earlier and threatened him, but nothing more. The investigation of the two suspects excluded any defects or blood traces on their clothing or bodies.

Discussion

The discovery of a body with numerous stab wounds at a very bloody death scene can instinctively raise the assumption of a homicide in the first instance. In our case the statements of witnesses who reported that they saw two individuals quickly leave the house and speed away a few hours before, combined with the medical examiner's estimated time of death range of 10 hours, were consistent and strengthened this hypothesis.

However, it is important not to be misled by first impressions. According to several authors, although this finding contradicts the intuitive assumption that a higher number of injuries is associated with a higher probability of a homicide, the number of sharp force wounds does not constitute a significant predictive factor to distinguish a murder from a suicide (4, 8). A single wound was present in only 29% of suicides studied by Brunel et al (14), while numerous cases of suicide committed with multiple knife wounds have been described in the literature (11, 12).

After discovery of the body, the analysis of the death scene is always critical. In our case, there were no signs of a fight in the house. According to some elements the victim and the aggressor seemed to be the same person. There were no signs of a fight inside the apartment. Observing the distribution of blood, the body was found where the fatal injuries had been sustained and the knife was very close to the body, next to his right arm. It was a kitchen knife, like the majority of sharp objects used in suicides (15). The mirror on the wall in front of the location of the body permitted the victim to see his reflection and to facilitate guiding his stabs.

According to previous reports of suicides by self-stabbing, they are more prevalent in males than females (4, 8, 14). The victim unbuttoned his shirt, as suicides often do to see more clearly where they are stabbing, and to ensure accuracy for hitting the target. On the neck, the front of the chest, the abdomen and the left wrist there were several hesitation marks, superficial sharp weapon injuries confined to the epidermal or upper-dermal layer. These are believed to be the most useful indication in the distinction of suicide from homicide in rare cases where they have been found in homicides (7, 14). The presence of hesitation marks and the absence of clothing defects seem more reliable than the number of injuries for establishing a suicide, and the absence of defensive or other type of wounds (i.e. blunt trauma), as in our case, is predictive of a suicide (14).

Furthermore, the location of the sharp weapon injuries was concordant with the conclusions of previous studies, in which the body regions most commonly injured in suicides are the neck, wrists, precordial region and epigastrium while injuries on the front of the neck, chest and abdomen are frequently found in homicide (7, 14). In cases of severe mental disease, the eyes, lips, nipples and genitalia tend to be spared (16).

While it is true that injuries on the front of the neck, chest and abdomen are frequently found in cases of murder, suicide victims are careful to target the intercostal spaces so as not to encounter resistance from the ribs and avoid other solid anatomical structures (14). This is consistent with our case in which there was only one wound with superficial scratches of the osteo-cartilaginous tissues.

In our case, all the stab wounds showed a downward direction of the thrust and the penetrating wounds were

grouped in clusters (left side of the front of the chest, abdomen above the navel). Grouping of the wounds in similar shape and orientation indicate that the deceased was not moving during the stabbing as opposed to fighting and trying to escape an attacker (17). In a self-inflicted stabbing, each stab wound is reasonably directed along the same trajectory, whereas in homicide the body position varies according to the movements of both the aggressor and the victim and the wounds are inflicted along different entry axes (10, 17).

The presence of a farewell letter accomplished in his own handwriting was an additional factor to be considered, although the literature indicates that the elements described above are more closely correlated with the suicide hypothesis (7).

The victim's psychological profile was investigated according to the so-called psychological autopsy (17), first mentioned in literature by Shneidman and Farberow in 1961 (19). These authors defined the psychological autopsy as follows: *"a retrospective reconstruction of the life of a person, able to identify aspects that reveal the intentions with respect to its death, provide clues about the type of death, on the level (if there was) to participate in the dynamics of death and explain why the death occurred at that time"*.

The initial aim of the psychological autopsy was to complete the forensic pathologists' investigation in determining the cause of death. Nevertheless, findings from pathologist did not always collect specific information about the manner of death and risk factors. Thus, psychological autopsy has been used to better understand suicide and homicide–suicide cases, by providing qualitative and quantitative knowledge of perpetrators, perpetrator–victim relationships, and underlying motives of these events (20-22).

Several studies based on psychological autopsies have been conducted especially in suicide. Especially the potential factors that may increase suicide risk have been investigated in case–control studies among specific populations and different ages. These reports involved suicide cases with or without a diagnosable psychiatric illness, different gender, and individuals receiving psychiatric treatment (23-28).

In our case, there were no significant elements in the decedent's personality or in his recent behavior that would indicate a suicide as the final escalation of a psychic disorder.

Conversely, he never appeared to suffer depression according to the criteria for a Major Depressive Disorder listed in Diagnostic and Statistical Manual of Mental Disorders (DSM V) published in 2013, listed in Table 2. None of the criteria were present in this case.

Nevertheless, suicide is not confined to depressed individuals.

The psychopathological perspectives on the present case arise from previous but essential Italian and International reports about suicide. Hendin defined suicide as self-punishment (29). It is typical of adult male subjects with a high and rigid self-esteem, who are particularly worried about the self-image developed over time; individuals who are exposed to failure, can resort to suicide as "self-punishment". In this case, the suicidal act was not induced by the depressive disorder but by the inability to tolerate frustrations arising in a situation which emphasized the distance between the idea the subject had of himself and what emerged from the facts, as proposed by Tatarelli in 1992 (30).

This dynamic is integrated by original Musatti's views (31) on the suicide of non-depressed subjects: the famous psycho-analyst explains the phenomenon of the conversion of external aggression to self-aggression as a form of self-punishment. When a person feels overwhelmed by reality, the first impulse is to rebel against what he or she perceives as a threat; the awareness of his or her weakness in dealing with the threat forces the subject to interpose, between himself and the reality, the unbridgeable distance of death. Suicide appears as an escape, providing the perception of an illusory victory over reality. In addition, the suicide imagines that by

Table 2. Diagnostic and Statistical Manual of Mental Disorders (DSM) -V Criteria for a Major Depressive Disorder (MDD).

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning: at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure: Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful). Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation). Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. Insomnia or hypersomnia nearly every day. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down). Fatigue or loss of energy nearly every day. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick). Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others). Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.
B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
C. The episode is not attributable to the physiological effects of a substance or to another medical condition.
Note: Criteria A-C represent a major depressive episode.

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that action s/he will regain the favor of the world through the social pity that the gesture stirs (32).

In the present case, the psychological profile demonstrated a fragile person suffering the consequences associated with the loss of his positive self-image, who was unable to deal with the psychological pressures of both his lover and his wife. The self-inflicted injuries likely represented an "escape" from the situation, a "self-punishment" and atonement for guilty feelings. He was frustrated by his incapacity to control the stressful events. This is reflected in the sequence of wounds. First, he injured his left wrist and neck (right side of the lateral cervical region) with no important blood loss, given the extreme superficiality of the injury, and proceeded to inflict other hesitation injuries using the knife tip and blade. He then launched into the series of abdominal stab wounds, which were not fatal because of the protection of the abdominal wall (thickness of about 7 cm) and the angle of the penetrations. He produced only minor injury of the omentum, some bowel loops and the root of the mesentery with modest blood loss without reaching particularly vascularized organs such as the liver, spleen or, more deeply, the aorta or kidneys. Finally, he hit himself in the chest and the sternum, reaching the region of the heart and left lung after several attempts obtaining the desired lethal effect.

So many self-inflicted knife strokes are rare but not a unique finding in the literature. In criminology the combination of frustration/violent aggression, often homicidal, is well known and a quantity of suicides is characterized by numerous stab wounds. The aggressiveness can be self-directed, especially if the guilt trip and inability to handle the situation prevail.

From a medico-legal point of view, atypical suicide is characterized by unusual/not typical dynamics and method of suicide, type of injuries, findings from crime scene investigation, and absence of psychological alteration and/or psychiatric diseases (33). The forensic pathologist must be open-minded about all reasonable causes of death. Also, among manners of death, differential diagnoses between accidental, suicidal, and homicidal death may be tricky (34). The psychological autopsy is useful to support the diagnosis of cause and manner of death disclosing sudden lifestyle changes, mood fluctuations (positive or negative), and unexpected mutation in any relationship with family members, friends or co-workers. These information are acquired through a detailed narrative account of events around the death, compared with other forensic findings.

In the present case, the a posteriori assessment of the elements supports the hypothesis of a suicide with a strong self-punishment overtone, fed by frustration and feelings of guilt and fear of destruction of his self-image.

Interaction and cooperation among professionals from various disciplines that are involved in death investigation is fundamental in correctly defining manner of death.

Only a comprehensive interpretation of all the elements (circumstances, the scene of death, autopsy findings, and psychological autopsy) led to the correct solution of this atypical case of suicide.

References

1. De Giorgio F, Lodise M, Quaranta G, et al. Suicidal or homicidal sharp force injuries? A review and critical analysis of the heterogeneity in the forensic literature. J Forensic Sci 2015; 60:S97-S107
2. De Luca d'Alessandro E, Di Folco L, Messano GA, et al. An insight into the occurrence of suicides in jails of an Italian region. Clin Ter 2015; 166:e209-15
3. Tattoli L, Krocker K, Sautter J, et al. Multidrug-related leukocytoclastic vasculitis raising suspicion of sexual homicide-things are not always what they seem. Int J Legal Med 2016; 130:179-83
4. Ohshima T, Kondo T. Eight cases of suicide by self-cutting or –stabbing: consideration from medico-legal viewpoints of differentiation between suicide and homicide. J Clin Forensic Med 1997; 4:127-32
5. Solarino B, Leonardi S, Grattagliano I, et al. An unusual death of a masochist: Accident or suicide? Forensic Sci Int 2011; 204:e16-9
6. Menezes RG, Murlimanju BV, Kharoshah MA, et al. Lobed spleen: an autopsy case report with emphasis on surgical anatomy. Clin Ter 2014; 165:143-5
7. Karakasi MV, Nastoulis E, Kapetanakis S, et al. Hesitation Wounds and Sharp Force Injuries in Forensic Pathology and Psychiatry: Multidisciplinary Review of the Literature and Study of Two Cases. J Forensic Sci 2016; 61:1515-23
8. Byard RW, Klitte A, Gilbert JD, et al. Clinicopathologic features of fatal self-inflicted incised and stab wounds: a 20-year study. Am J Forensic Med Pathol 2002; 23:15–8.
9. Fukube S, Hayashi T, Ishida Y, et al. Retrospective study on suicidal cases by sharp force injuries. J Forensic Leg Med 2008; 15:163–7
10. Karger B, Niemeyer J, Brinkmann B. Suicides by sharp force: typical and atypical features. Int J Leg Med 2000; 113:259-62
11. Karger B, Vennemann B. Suicide by more than 90 stab wounds including perforation of the skull. Int J Leg Med 2001; 115:167-9
12. Lieske K, Püschel K, Bussmann E. [Suicide by 120 stab wounds of the chest?]. Arch Kriminol 1987; 180:143-9
13. Ebert BW. Guide to conducting a psychological autopsy. Professional Psychology: Research & Practice 1987; 18:52-6
14. Brunel C, Fermanian C, Durigon M, et al. Homicidal and suicidal sharp force fatalities: Autopsy parameters in relation to the manner of death. Forensic Sci Int 2010; 198:150-4
15. Hainsworth SV, Delaney RJ, Rutty GN. How sharp is sharp? Towards quantification of the sharpness and penetration ability of kitchen knives used in stabbings. Int J Legal Med 2008; 122:281-91
16. Mazzolo GM, Desinan L. Sharp force fatalities: suicide, Homicide or accident? A series of 21 cases. Forensic Sci Int 2005; 147:S33-5
17. Kaliszan M, Kernbach-Wighton G, BouHaidar R. Multiple self-inflicted stab wounds to neck and abdomen as a unique manner of suicide. J Forensic Sci 2010; 55:822-5
18. Cavanagh JT, Carson AJ, Sharpe M, et al. Psychological autopsy studies of suicide: a systematic review. Psychol Med 2003; 33:395-405
19. Shneidman ES, Faberow NL. Cry for help. New York,McGraw Hill,1961
20. Knoll JL, Hatters-Friedman S. The Homicide–Suicide Phenomenon: Findings of Psychological Autopsies. J Forensic Sci 2015; 60:1253-7

21. Zalsman G, Siman Tov Y, Tzuriel D, et al. Psychological autopsy of seventy high school suicides: Combined qualitative/quantitative approach. Eur Psychiatry 2016; 38:8-14
22. Werlang BG, Botega NJ. A semi-structured interview for psychological autopsy in suicide cases. Rev Bras Psiquiatr 2003; 25:212-9
23. González-Castro TB, Hernández-Díaz Y, Tovilla-Zárate CA, et al. Differences by gender in completed suicides in a Mexican population: a psychological autopsy study. J Forensic Leg Med 2016; 38:70-4
24. Ross V, Kõlves K, De Leo D. Beyond psychopathology: A case–control psychological autopsy study of young adult males. Int J Soc Psychiatry 2017; 63:151-60
25. Giupponi G, Conca A, Innamorati M, et al. Differences among South Tyrolean suicides: a psychological autopsy study. Wien Klin Wochenschr 2016; 128:125-30
26. Hirokawa S, Matsumoto T, Katsumata Y, et al. Psychosocial and psychiatric characteristics of suicide completers with psychiatric treatment before death: A psychological autopsy study of 76 cases. Psychiatry Clin Neurosci 2012; 66:292-302
27. Hirokawa S, Kawakami N, Matsumoto T, et al. Mental disorders and suicide in Japan: A nation-wide psychological autopsy case–control study. J Affect Disord 2012; 140:168-75
28. Paraschakis A, Michopoulos I, Christodoulou C, et al. A 2-Year Psychological Autopsy Study of Completed Suicides in the Athens Greater Area, Greece. Psychiatry Investig 2015; 12:212-7
29. Hendin H. The psychodynamics of suicide. J Nerv Ment Dis 1963; 236-44
30. Tatarelli R. Suicidio. Psicopatologia e prevenzione. Roma, il Pensiero Scientifico Editore, 1992
31. Musatti C. Trattato di psicoanalisi. Torino, Einaudi, 1957
32. Corfiati L, D'Introno N, Maggiolino O, et al. Il desiderio di non esserci. Bari, Levante, 1994
33. Massaro L. Unusual suicide in Italy: criminological and medico-legal observations-a proposed definition of "atypical suicide" suitable for international application. J Forensic Sci 2015; 60:790-800
34. Massoni F, Di Sabatino D, Ricci L, et al. A rare case of myocardial infarction by myocardial bridging of circumflex artery. Clin Ter 2014; 165:e416-8