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Prior exposure of the entrance wound region from clothing is uncommon in firearm suicides

Received: 18 November 1996

Abstract According to an old rule still in use, gunshot suicides will rarely shoot through the clothing but will pull it aside to bare the skin. Thus, a bullet defect in the clothing would be an indicator for homicide or an accident. A total of 138 clearly defined gunshot suicides were analysed with regard to this topic. The thorax, which is commonly covered by textile, was the target for 27 suicides (19.5%). Of these 27 persons, 25 had fired through the clothing and 2 had placed the muzzle directly on the exposed skin, which represents a relative frequency of only 7%. Special features such as thick clothing or an affected state of mind did not appear to influence this behaviour. Consequently, the perforation of textile does not suggest homicide or an accident - it is not applicable as a criterion for distinguishing different modes of death. Only in the rare cases when a gunshot victim is found with intact clothing covering the entrance wound can this finding be interpreted as an indication for suicide.

Key words Gunshot fatalities · Clothing · Suicide · Homicide

Introduction

The differentiation between suicide, homicide and an accident is one of the fundamental objectives in the investigation of gunshot fatalities. Certain criteria have been established for this purpose, such as the location of the entrance wound, the shooting distance, the direction of the trajectory in relation to the anatomical situation, the search for a shooting hand or a hand used to steady the muzzle (Sellier 1982; DiMaio 1985; Karger 1996) and the potential for physical activity in cases of multiple hits (Karger 1995a,b). For one century, another criterion is re-

peatedly stressed in the literature: "The suicide will usually remove his clothing and fire the weapon against exposed skin" (Puppe 1908). This statement or very similar variations thereof can be found in most German text books from the beginning of this century (e.g. Gross 1908; Strassmann 1911; Kratter 1919; Reuter 1933; Mueller 1953) up to the present. Mueller (1933) considered it a "generally accepted school of thought". Some English language text books contain the same statement, e.g. Knight (1977): "A useful observation is that suicides rarely shoot themselves through their clothing, but usually pull it aside to bare the skin". Therefore, suicide would be an unlikely explanation if the clothing of a gunshot wound victim show a bullet defect corresponding with the entrance wound. It is interesting that the authors of this article were unable to find a single literature source verifying this rule by a systematic investigation of gunshot suicides. Instead, the rule detailed above is usually expressed as empirical knowledge derived from large case work experience. Various points which have been emphasized are that a suicide will never shoot through thick clothing (e.g. Reuter 1933; Mueller 1953) or that exceptions from the rule will mainly involve persons in an affected state of mind (Mueller 1933, Weimann 1933).

Mueller (1933) cautioned not to generalize the rule and Weimann (1933) reported a number of examples showing the contrary, which he considered frequent exceptions to the rule. A doctoral thesis (Lerch 1982) reported perforation of clothing in 63% of all suicides with gunshot wounds to the thorax and Ropohl and Koberne (1990) found the same situation in 18 out of 22 cases (82%). But since both publications were statistical surveys of gunshot fatalities, this aspect was treated only marginally and the results are therefore rarely cited in the literature. Consequently, the rule that suicides do not shoot through their clothing is still frequently applied. It is the intention of this paper to clarify the matter by a detailed analysis of suicidal gunshots involving an entrance wound in a body region that is commonly covered by clothing, i.e. the thorax.

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Material and methods

The autopsy records of the Institute of Legal Medicine, University of Münster, from 1967 to 1995 were checked for gunshot suicides. The location of the entrance wound(s) was recorded. Thus, all suicidal gunshots to the thorax were identified. But in a considerable number of cases, especially in old ones, the corpses were already undressed when brought to autopsy. So for the purpose of a complete and reliable analysis, all accessible material was collected and evaluated. The autopsy record, the alcohol report and the prosecution department record, including the police report and photographs of the scene, were available in every case.

Results and discussion

Out of 138 clearly defined gunshot suicides, 27 suicides (19.5%) had fired 33 gunshots to the thorax. In 25 cases the clothing was perforated (Fig. 1) and in 2 cases the skin of the entrance wound region had been exposed prior to the gunshot, which represents a relative frequency of only 7%. In the first case, a young man fired a .22 rifle between the opened buttons of his shirt on a hot summer evening. In the second case, a young man shot himself in the left chest with a 9 mm Parabellum (= Luger) pistol while lying on the bed with the upper part of the body naked and his pullover on the blanket. While the second case of exposure of the entrance wound region appears to be with intent, this is not clear for the first case, where the high ambient temperature favoured the casual wearing of the shirt.

The small number of cases involving exposure of the skin ($n = 2$) of course renders a statistical analysis impossible. But no ballistic, personal or environmental peculiarities could be detected in these two cases or in the group with perforation of the clothing. The 27 suicides included two women and in both cases the gunshot had perforated the clothing. The firearms used did not show any peculiarities (Table 1). According to the old school of thought, a suicide in public or in the presence of other persons is an



Fig. 1 Multiple gunshot suicide with a .38 special revolver: entrance defects in the pullover and shirt from three closely grouped contact shots

Table 1 The firearms used in the 27 suicides analysed. A signal pen gun, a stud gun (nail gun) and a humane killer for livestock slaughter are summarized as unusual weapons

	Hand-guns	.22 rifles	Centre-fire rifles	Shot-guns	Unusual weapons
Perforation of textile	12	5	2	3	3
Exposure	1 (9 mm Luger)	1			

Table 2 The presence or absence of other persons during the course of the suicide

	Alone	Not alone
Perforation of textile	19	6
Exposure	1	1

Table 3 The three categories of clothing worn by the suicides. Light = e.g. T-shirt, shirt. Medium = e.g. pullover, sweat-shirt. Heavy = e.g. coat, jacket

	Light	Medium	Heavy
Perforation of textile	12	12	1
Exposure	1	1	

indication of an affected state of mind (Mueller 1933; Weimann 1933). But an analysis of the circumstances revealed that in the vast majority of cases in both groups (alone vs not alone) the gunshots perforated the clothing (Table 2). Blood alcohol was positive in 16 individuals (60%) and exceeded 1.5‰ in 9 of them. The two persons with prior exposure of the skin showed blood alcohol levels of 1.87‰ and 0.30‰. The clothing worn by the suicides was categorized into 3 groups (Table 3). Different clothing was worn in the two cases where prior exposure had occurred and the only case involving heavy clothing, i.e. a winter coat, was not pulled aside but perforated (Table 3). An incomplete perforation of the clothing, possibly a partial exposure, could be verified in a single case, where the man fired a signal pen between the opened buttons of a jacket through the underlying shirt.

Altogether, the results of this study present unequivocal evidence that present day and recent suicides commonly do not pull the clothing aside to bare the skin but shoot themselves through the clothing regardless of special features such as thick clothing or highly emotional situations. Consequently, the perforation of textile does not suggest homicide or an accident - it is not applicable as a criterion for distinguishing different modes of death. Only in the rare cases when a gunshot victim has bared the region of the entrance wound from textile can this finding be interpreted as an indication for suicide. It is difficult to explain why baring of the skin was apparently observed more frequently in the beginning of this century. Possibly, the importance of clothing for the heirs of the victim was more highly valued, or the fear of reducing the

penetration power of the projectile in cases of heavy clothing was realistic considering the wide dissemination of small pocket handguns, which frequently contained fulminating mercury as propellant. But these considerations are no longer relevant, which is reflected by the low frequency of prior exposure of the entrance wound region. Contrary to firearm suicides, however, suicides by sharp pointed weapons show exposure of the respective body region in a majority of cases (Bajanowski et al. 1991, Start et al. 1992).

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