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Fatal suicidal perforating crossbow bolt injury of the chest

Peter Očko[1,2], Ľubomír Mikuláš[1,2], Ján Šikuta[1,2], Roman Kuruc[1,2], Jozef Šidlo[1,2]

[1] Institute of Forensic Medicine, Faculty of Medicine, Comenius University in Bratislava, Bratislava, Slovak republic
[2] Department of Forensic Medicine, Health Care Surrveilance Authority, Bratislava, Slovak republic

Peter Očko and Jozef Šidlo contributed equally to this work.

SUMMARY
Traumatic injury due to crossbows is a rare occurrence these days. The aim of this study is to present a case of perforating chest injury caused by a bolt shot from a crossbow in suicidal intent which occurred "live" during a telephone conversation. The autopsy revealed perforation of the heart and left lungs with massive bleeding to the left pleural cavity which caused haemorrhagic shock. The motive of the man's suicide was the breakup with his girlfriend.

Keywords: suicide – mechanical shooting weapon – crossbow – perforating chest injury – autopsy

Samovražda perforujúcim poranením hrudníka šípom kuše

SÚHRN
Poranenia spôsobené mechanickou strelnou zbraňou – šípom vystreleným z kuše – sú v dnešnej dobe zriedkavé. V súdnolekárskej praxi sa s nimi stretávame výnimočne, predovšetkým s ich smrteľnými následkami. Najčastejšie ide o úmyselné poranenia spôsobené napadnutím inou osobou, v menšom počte prípadov ide o poranenia spôsobené v samovražednom úmysle. Zbrane sú najčastejšie cielené na oblasť hlavy a hrudníka. V oblasti hrudníka v publikovaných prípadoch ide prakticky vždy o zástrely. Autori prezentujú prípad smrteľného poranenia hrudníka – priestrelu – u 38-ročného muža, ku ktorému došlo počas telefonického rozhovoru so svojou bývalou priateľkou v samovražednom úmysle. Perforáciu hrudníka je možné pripísať výraznej prieraznosti vystreleného šípu, ktorá v mnohých prípadoch prevyšuje prieraznosť projektilu vystreleného z palnej zbrane. Pri pitve bol zistený priestrel srdca a ľavých pľúc so zakrvácaním do perikardu a pohrudnicovej dutiny. Strelný kanál smeroval spredu dozadu, veľmi mierne sprava doľava a veľmi mierne zhora nadol. Bezprostrednou príčinou smrti bol hemoragický šok. Muž bol ovplyvnený etanolom v štádiu podnapitosti. V oblasti predlaktia boli zistené jazvy po predchádzajúcom pokuse o samovraždu. Vzhľadom na narastajúci počet smrteľných prípadov spôsobených mechanickou zbraňou napadnutím inou osobou, ale aj v samovražednom úmysle, bolo by potrebné zvážiť obmedzenie prístupu k týmto zbraniam, ktoré sú v mnohých krajinách voľne predajné aj osobám bez zbrojného preukazu.

Kľúčové slová: samovražda – mechanická strelná zbraň – kuša – priestrel hrudníka – pitva

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Today in forensic practice, we rarely meet with injuries caused by a mechanical firearm – a bolt shot from a crossbow. Fatal injuries occur even more rarely. A small part of them is caused accidentally, but crossbows are also used as a homicide agent, less frequently as a suicide tool (1,2). The target areas of the body involved are most often the head and chest (2, 3, 4) but cases of affecting the throat (5), abdomen (6), or combined chest and abdominal injuries (7) were also described. All published cases of chest injuries are virtually penetration injuries.

The aim of this study is to present a case of perforating chest injury caused by a bolt shot from a crossbow in suicidal intent.

✉ ***Correspondence address:***
Jozef Šidlo, MD, CSc, MPH, FIALM, Assoc Prof
Institute of Forensic Medicine, Faculty of Medicine,
Comenius University in Bratislava
Sasinkova 4, 811 08 Bratislava, Slovak republic
phone: +421904819241
fax: +421220856556
e-mail: sidlo45@gmail.com

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CASE HISTORY

It was a 38-year-old man who, over the night, repeatedly threatened by phone his former girlfriend to kill himself if she did not come to him. During the phone call at 1:32 a. m. the girlfriend suddenly heard a click and swish – a crossbow shot and then the man's rattle. Immediately she came to his house and found the man with no signs of life in the room lying in a supine position on the bed with lower limbs hanging down. There was a crossbow between his feet on the floor (Fig. 1), and a crossbow bolt stabbed in his chest. The man's body and the location of his finding were inspected by police officers and an examining physician who ordered an autopsy.

AUTOPSY FINDINGS

An autopsy was performed 33 hours after death. The man was wearing pyjamas through which a bolt from the crossbow in the area of the left chest wall and the left back penetrated from front to back (Fig. 2). The clothing around the bolt was soaked in blood, more in the back. The entry wound was superior 3 cm to the level of the left nipple, and 5.5 cm to the left of the midline. The direction of the wound was posterior, slightly right to the left, and slightly downward. The exit wound was inferior to

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the left scapula, and 6.5 cm to the left to the posterior midline (Fig. 3). After the removal of the bolt, the edges of both wounds were approximated. The both wounds were in the form of triple radial, smooth-sided cut, with lengths between 3.7 and 2.2 cm of the entry wound (Fig. 4) and between 1.5 and 1.5 cm of the exit wound (Fig. 5) after reconstruction of the wound edges. These wounds patterns correlated with a three-bladed bolt tip with one broken blade. The bolt passed through the third intercostal space, pericardial sac, left ventricle of the heart, lower lobe of the left lung (Fig. 6), 7th intercostal space slightly to the right of the scapula line with breaking off the upper edge of the 8th rib and the tip was located out of the chest behind the exit wound. The wound track was approximately 25 cm in total length. There were 950 g of blood clots and 400 ml of liquid blood in the left pleural cavity; the pericardium contained 80 g of blood clots and 10 ml of liquid blood. There occurred petechial bleeding of the conjunctiva and under the pleura. As a side finding, six approximately parallel transversely, concerning the long limb axis, oriented skin scars were found at a typical location in the lower third of the palm of the left forearm. Histopathological examination of samples of internal organs taken at autopsy revealed no noticeable pathological changes. Toxicological analysis of blood and urine samples taken at autopsy showed ethanol concentration of 0.86 g/kg in blood and 0.84 g/kg in urine, which suggests influence in the stage of tipsiness. Other foreign substances, including illicit and prescription drugs, were not identified. The immediate cause of death was a haemorrhagic shock.

The weapon used was a recurve crossbow (Fig. 7). A hunting bolt measured 47.5 cm in length and had a three-bladed tip arranged in a radial pattern with one broken blade.



Fig. 1. View of a crossbow between man's feet on the floor.

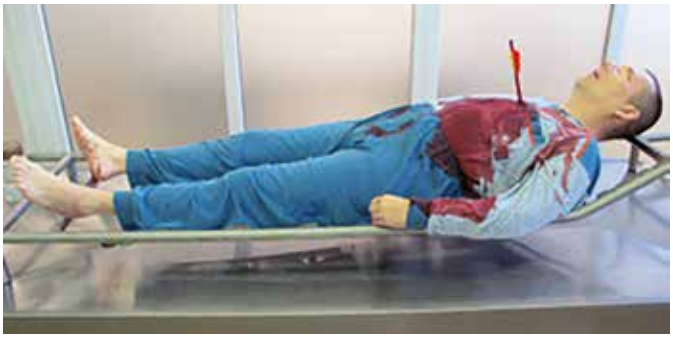


Fig. 2. General view of a man's body before autopsy.



Fig. 3. View of the back and the bolt tip in the exit wound.

DISCUSSION AND CONCLUSION

The presented case study is interesting from several points of view. The use of a mechanical firearm – a crossbow – as a wound-



Fig. 4. Detail view of the entry wound.

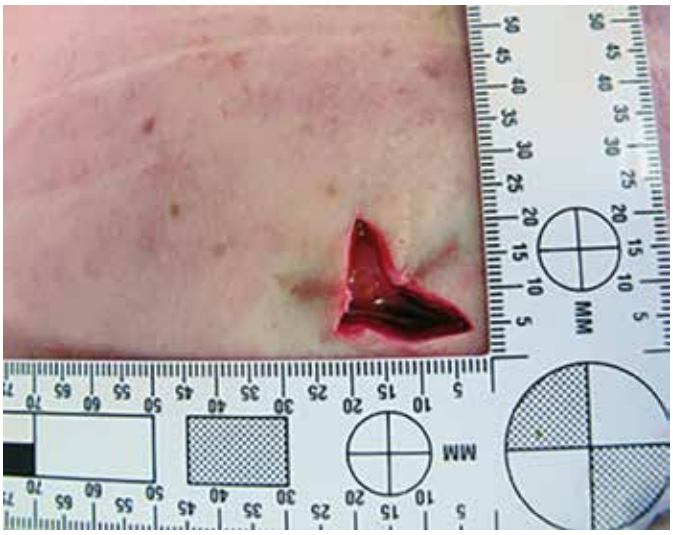


Fig. 5. Detail view of the exit wound.

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Fig. 6. Perforation of the heart and the lower lobe of the left lung.

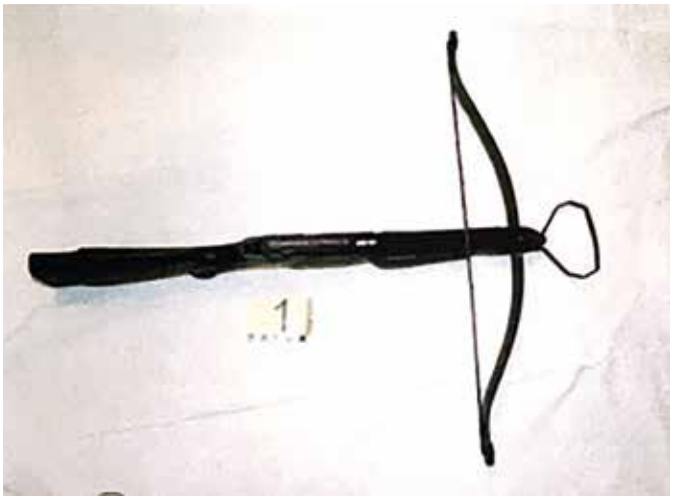


Fig. 7. Detail view of the used recurve crossbow.

ing tool against man is nowadays very rare, although, in many countries, mechanical guns are relatively readily available compared to firearms, since the only restriction on their sale is only the age of a person under 18 years. A bolt shot from a crossbow, perhaps surprisingly, has a significant penetration, often exceeding that of firearms. This is due to the kinetic energy and a relatively high speed of the flying bolt, which is only a quarter to one sixth of the speed of the projectile fired from firearms; nevertheless, the weight of the bolt and the construction of a high-quality hunting tip make it possible to puncture often up to 80 – 90 cm of living matter. A hunting tip cuts through the tissues, and when it hits the heart, it immediately causes massive bleeding (8). The scientific literature describes cases of successfully rescued persons following a crossbow bolt injury, as well as fatalities of various intent, including homicide (9,10). Giorgetti et al. found that on a set of published fatalities, the number of homicides was almost twice as high as the number of suicides. In a set of 36 cases, 22 were homicides, 12 were suicides, and 2 were accidents. The target areas were the head in 16 cases, the chest in 15 cases, in 4 cases the abdomen, and in one case the upper limb (11). In our case, it was the use of a crossbow in suicidal intent. A rarity of the case is that the use of crossbow and death occurred "live" during a telephone conversation between the man and his ex-girlfriend who heard a click and swish, i.e., directly a shot from a crossbow. The motive of the man's suicide was the breakup with his girlfriend for mutual disagreement about four months before his death. During that period, repeatedly under the influence of alcohol, he telephoned her, especially on weekends, and threatened to kill himself or kill himself on a motorcycle. At the time of question before his death, he called her at 11:40 p. m. to come to him, which she refused. Then at 1:11 a. m. he sent her an MMS with a crossbow photo and the text "you are to blame". She texted him back to stop doing this. In turn, at 1:32 a. m., he called her again to come to him and when she refused, she heard a shot. Since the man was under the influence of ethanol in the stage of tipsiness at the time of death, it can be assumed that the consumption of alcohol was likely to deliver courage. The scars found at autopsy on the left forearm most likely suggest a previous suicide attempt in the past. Another exceptional aspect of the present case is that the cases of chest injuries described in the scientific literature are penetration injuries only. In our case, it was a perforation injury, i.e., the bolt pierced the full thickness of the chest.

Due to the growing number of fatal cases caused by a mechanical firearm – crossbow – by attacking by another person, but also by self-harm, it would be necessary to consider restricting access to these weapons, which in many countries are freely for sale even to persons without a gun licence.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

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