Injuries and Deaths Caused by Mole Guns

Köstebek Silahlarıyla Meydana Gelen Yaralanma ve Ölümler

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ABSTRACT Objective: Mole guns are commonly used to kill detrimental animals. They sometimes cause injuries, even lethal ones, and are occasionally used in crimes. A mole gun propels pellets similar to a shotgun. **Material and Methods:** In this study, 24 cases of injuries in the province of Konya (Turkey) between 2004 and 2007 and 4 cases of death in the provinces of Konya, Burdur, Erzincan and Denizli (Turkey) that were caused by mole guns were analyzed. **Results:** In the cases involving non-lethal injuries, 23 victims were males and one was a female. Their ages ranged between 2 and 80 years with an average age of 50.8 ± 17.7 years. The most represented age group in the range was 60-69 years with 8 cases and 19 of the cases were farmers. In 3 of the cases that led to death, the manner of death was an accident and 1 case was a homicide. **Conclusion:** As the mole gun can cause various disabilities and lethal wounds to humans when fired from a short distance, its production and use should be prohibited.

Key Words: Firearm; death

ÖZET Amaç: Köstebek silahları zararlı hayvanları öldürmek amacıyla sık kullanılır. Bu silahlar bazen ölümcül de olabilen yaralanmalara neden olabilirler ve zaman zaman suç işlemek amacıyla kullanılabilirler. Köstebek silahında tüfektekine benzer saçmalar kullanılır. **Gereç ve Yöntemler:** Bu çalışmada, 2004-2007 yılları arasında Konya'da (Türkiye) köstebek silahı ile meydana gelen 24 yaralanma ve Konya, Burdur, Erzincan ve Denizli'de (Türkiye) meydana gelen 4 ölüm olgusu incelenmiştir. **Bulgular:** Ölümcül olmayan yaralanması bulunan olgulardan 23'ü erkek 1'i kadındır. Olguların yaşları 2-80 arasında değişmektedir; ortalama yaş 50.8 ± 17.7 yıldır. En geniş grubu, 8 olgu ile 60-69 yaşları arasındaki bireyler meydana getirmektedir; olguların 19'u çiftçidir. Ölümle sonuçlanan olguların 3'ünde orijin kaza, 1'inde ise cinayettir. **Sonuç:** Köstebek silahı, yakın mesafeden ateşlendiğinde insanlarda ölümcül olabilen yaralara ve maluliyetlere neden olabildiğinden, bu silahların üretimi ve kullanımı kısıtlanmalıdır.

Anahtar Kelimeler: Ateşli silah; ölüm

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Possession of firearms is limited because of the technological requirements in production and strict laws. However, anyone can manufacture a handmade firearm by following some simple instructions and these actions do not a carry any legal liability. A mole gun is an unusual weapon used to kill moles in agricultural areas.[1] In Turkey, mole guns are commonly used to kill detrimental animals. They sometimes cause injuries, even lethal ones, and are occasionally used in crimes.[1,2]

The mole gun, which looks like a front-loading shotgun, fires pellets propelled by the pressurized gas caused by the blast effect of the gunpowder, which is ignited by striking the cartridge with the hammer in the back part of the device. A mole triggers the firing mechanism by pushing a ring-shaped metal collar backward as it stretches its head through to get some food placed within the front of the device.[2,3]

In this paper, lethal and non-lethal injuries, all caused by mole guns, are evaluated.

MATERIAL AND METHODS

The data for the cases of non-lethal injuries caused by mole guns were obtained from the Konya Attorney Generalship's records for the period from 2004 to 2007. Also, 4 cases of death from the provinces of Konya, Burdur, Erzincan and Denizli in Turkey were included in the study. Cases of non-lethal injuries were evaluated in terms of socio-demographic properties, locale of residence, scene and manner of case, gauge of gun, regions of the injuries and damages to the body. The data were summarized as mean ± standart deviation, median ± quartile deviation and absolute values. Mann Whitney U-test was used to compare groups. Relevance for categorical distribution was evaluated by chi-square test.

RESULTS

LETHAL INJURIES

Case 1

A 42-year-old man was murdered by his uncle using a 12 gauge caliber mole gun in August of 2004 in Aksehir County of Konya City. During the external examination, three wounds were observed, including an ecchymosis over the right eyebrow, which was 2 x 1 cm in dimensions, and 2 buckshot wounds, which were each 0.5 x 0.5 cm in dimensions and localized to the right neck region separated by a 1 cm distance. In the internal examination, there was a right carotid injury that was localized near the bifurcation and wide hemorrhages in the soft tissues of the neck were recorded. Two buckshot pellets were removed from the soft tissues of the neck.

Case 2

A 45-year-old man was injured on the right thigh region while he was setting a mole gun to kill moles, which were damaging the vegetables in his field, and died shortly after at the incident scene in August of 2005 in the Karamanli County of Burdur City. During the scene investigation, it was observed that potato, melon, corn and sunflower, among other vegetables and fruits were sown in the field. The victim had dug 2 holes in the field and had reached the tunnels made by the moles. While he was setting the 12 gauge caliber mole gun in 1 of the tunnels (Figure 1), it fired accidentally seriously injuring the victim. There was a hole of 4 by 2.5 cm in dimensions in the left upper medial region of the victim's trousers.

During the external examination, a single-entrance wound of pellets 3 x 2.5 cm in diameter was observed that were localized to 12 cm below the left inguinal region (Figure 2). During the internal examination, it was observed that the left femoral artery and vein were seriously damaged. A large number of shotgun pellets of 3.25 mm in diameter were removed from the inside of the vessels, muscles and soft tissues of this region.

Case 3

A 65-year-old man had set up a 16 gauge caliber mole gun mechanism in his potato field in June of 2005 in Cayirli County of Erzincan City. A few days later, he removed the mole gun from its fitting, because the gun had not worked as planned. While he was checking it, it suddenly fired and in-

FIGURE 1: The mole gun in the field (2nd death case).

FIGURE 2: A single-entrance wound of pellets (2nd death case).

jured his right lower abdominal region. Although he was brought to the hospital quickly, he died during surgery in the general surgery clinic.

During the external examination, a 2 x 2 cm single-entrance wound of pellets with peripheral soot on the right lower abdominal region was observed. During the internal examination, multiple perforations of the cecum, intestines, right iliac artery and vein were determined. A large number of shotgun pellets, each measuring 2.5 mm in diameter were removed from the abdominal cavity.

Case 4

While a 69-year-old man had been trying to set up a mole gun in his chickpea field, the weapon fired accidentally, seriously injuring the victim in his left chest region in July of 2005 in the Cameli County of Denizli City. He died in the field shortly after he was injured. During the scene investigation, 2 tunnels that had been dug by moles were observed in the field. There was a hole with peripheral soot in the chest region of the victim's shirt and undershirt that was 3 x 3 cm in dimensions.

During the autopsy, a single-entrance wound of pellets 3 x 3 cm in diameter with peripheral soot on the left chest region was observed. A shotgun wad was removed from the right ventricle and a large number of shotgun pellets, each 3.25 mm in diameter, were found in the thoracic cavity. Serious injuries, caused by multiple shotgun pellets, were observed on the 7th left rib, inferior lobe of the left lung and left and right ventricles of the heart. There was one liter of blood in the left and 700 cc of blood in the right thoracic cavity.

NON-LETHAL INJURIES

In the cases involving injuries, 23 were males and 1 was a female. Their ages ranged between 2 and 80 years with an average age of 50.8 ± 17.7 years. Injuries mostly occurred in April, May, June, July and August (21 cases). When evaluated according to seasons, most of the injuries occurred in summer (15 of 24 injuries, χ^2=10.75, p< 0.01). The most represented age group was 60-69 years (8 cases) and 19 of the cases were farmers. In 21 cases, the injuries involved one of the hands. In 14 of the cases, there were amputations of various severities involving one or more fingers. Fifteen of the cases were injured in the counties, whilst nine cases were wounded in the city center. The ages of the injured people living in city center (42.0 ± 14.3, median ± quartile deviation) was lower than the injured people living in counties (61.0 ± 8.5, median ± quartile deviation) (p< 0.01). Fifteen of the injuries occurred when setting the gun. The data for the injury cases are shown in Table 1.

DISCUSSION

Mole guns are primitive weapons produced for the purpose of trapping and are capable of firing a standard shotgun cartridge. A typical mole gun consists of three parts:

1) A metal ring in the front, connected to a trigger mechanism,

2) A barrel and

3) A trigger mechanism (Figure 4).[1]

The barrel is either a 12 or 16 gauge caliber and its length is 10 cm. The barrel is opened in the

TABLE 1: Properties of the non-lethal injuries by mole guns.

Number	Age	Sex	Month	Occupation	Locale of residence	Scene	Manner of case	Gauge of gun (caliber)	Regions of the injuries	Damages to the body
1	2	M	7	Child	C. center	Bean field	Playing with set up gun	12	Right hand, left shoulder	Fracture of the 1st DP
2	18	M	3	Farmer	C. center	Potato field	Setting up the gun	12	Left hand	Amputation at the 2nd PIP level
3	32	M	8	Civil servant	C. center	Potato field	Controlling the gun	12	Left upper eyelid, lower lip, left hand	Amputation at the 1st DIP level, pellet wounds on the left upper eyelid and lower lip regions
4	33	M	5	Farmer	C. center	House	Taking the gun from cupboard	12	Right hand	Amputations at the 2nd-3rd PIP level
5	41	M	7	Farmer	County	Potato field	Controlling the gun	12	Right hand	Fractures of the 2nd-3rd PP
6[a]	42	M	11	Farmer	C. center	Shamrock field	Controlling the gun	12	Right hand	Soft tissue injury (Figure 3)
7	44	M	5	Farmer	C. center	Potato field	Setting up the gun	16	Left hand	Fractures of the 3rd-4th PP 3rd extensor tendon defect
8	44	M	5	Farmer	C. center	Potato field	Controlling the gun	12	Left eye	Left eye perforation
9	45	M	6	Farmer	County	Garden	Controlling the gun	12	Right hand	Amputation at the 2nd DIP level
10	45	M	6	Farmer	County	Potato field	Setting up the gun	12	Left hand	Amputation at the 2nd DIP level
11	49	M	9	Farmer	County	Garden	Controlling the gun	16	Right hand	Multiple fractures of the 1st-2nd-3rd P
12	52	M	6	Farmer	County	Onion field	Setting up the gun	12	Left hand	Amputations at the 2nd-3rd DIP level
13	52	M	6	Farmer	County	Beet field	Setting up the gun	12	Right hand	Amputations at the 2nd-3rd-4th DIP level
14	55	M	6	Farmer	County	Garden	Setting up the gun	12	Right hand	Amputations at the 2nd-3rd DIP level
15	61	M	5	Farmer	County	Chickpea field	Setting up the gun	12	Left hand	Amputation at the 4th DIP level
16	62	M	4	Farmer	County	Potato field	Setting up the gun	12	Right hand	Amputations at the 2nd-3rd PIP level
17	63	M	7	Retired	C. center	Potato field	Watching to the 21st case	12	Abdomen	Injuries of the intestines, large bowels, spleen and kidney
18	64	M	7	Farmer	County	Potato field	Setting up the gun	12	Right hand	Amputations at the 2nd-3rd-4th-5th DIP level
19	65	F	4	House wife	County	Onion field	Setting up the gun	12	Left hand, right leg	Amputations at the 2nd-3rd DIP level
20	65	M	7	Retired	C. center	Garden	Setting up the gun	12	Face	Right zygomatic fracture
21	66	M	8	Farmer	County	Potato field	Setting up the gun	16	Right hand	Fractures of the 2nd-3rd MC
22	68	M	7	Farmer	County	Field	Setting up the gun	16	Right hand	Amputations at the 2nd-3rd PIP level
23	71	M	6	Farmer	County	Garden	Setting up the gun	12	Left hand	Fractures of the 2nd-3rd MC
24	80	M	7	Farmer	County	Corn field	Setting up the gun	12	Right hand	Amputations at the 2nd-3rd DIP level

M: male, F: female, C. center: city center, P: phalanx, MC: metacarpus, MCP: metacarpophalangeal joint, DP: distal phalanx, PP: proximal phalanx, DIP: distal interphalangeal joint, PIP: proximal interphalangeal joint, MT: metatarsus.

[a] He was wearing a gauntlet while he was working in his shamrock field and the gauntlet was extremely damaged during the accident.

FIGURE 3: Pellets are seen in the radiograph of the right hand (Table 1, case 6)

FIGURE 4: Design of a typical mole gun. (a) A metal ring in front of the gun, connected to the trigger mechanism; (b) Barrel, and (c) Trigger mechanism.

front and locked after the cartridge is placed within. There is a metal ring 8 cm in front of the barrel's edge, where food, such as a potato or an onion is placed. The mole gun's mechanism is simple; to reach food, the mole places its head through the metal ring, which is pushed backwards, thus triggering the mechanism and propelling the pellets from the barrel. The ignition mechanism is composed of a thick nail stretched by a spring.[1]

When the mole gun is fired with cartridges containing 32-g pellets each of 3.25 mm in diameter, the average muzzle velocity of the pellets was reported to be 165 m/s, which is lower than that of standard shotguns. The low velocity causes loss of energy according to the equation, $E=1/2\ mV^2$. Although the energy of the pellets discharged by the mole gun is lower than that of a shotgun, these pellets are still capable of causing lethal wounds.[1]

There are not any data concerning the distributions of the mole guns according to the regions and the prevalence of injuries and deaths caused by mole guns for the various regions of Turkey. In a study about mole guns which have been sent for examination to The Council of Forensic Medicine, Turkey, by General Attorneyships and have been used in different crimes, the majority (7 of the 11 mole guns, 64%) originated from the Inner Anatolian region, 2 (18%) from the Aegean region, 1 (9%) from the East Anatolian region and one (9%) from the Black Sea region.[4] These findings show that mole guns are used mostly in the Inner Anatolia region of Turkey. Agriculture is an important mainstay in this region, which may explain the high ratio of mole gun use. The province of Konya (Turkey) is situated above a wide plain that is also in the Inner Anatolian region. Thus, as agriculture is an important mainstay of Konya province, it is not surprising that injuries caused by mole guns are seen frequently in this region.

Injuries and deaths caused by mole guns are generally a result of an accident while the victim is setting or controlling the gun. In this study, injuries most often occurred during the warmer months of April, May, June, July and August (21 cases of a total of 24 injuries). Because these months are agriculture's active terms, struggles with mole infestations are likely to increase naturally. Farmers compose a high risk group for mole gun-related injuries and death, because they are the most frequent users of these devices.

Guven et al. reported an isolated penile trauma case caused by pellets in a 67-year-old man who was injured while he was trying to set up a mole gun.[5] In our study, hand or finger injuries were observed in 21 of the cases. These types of mole gun injuries can lead to or cause hand or finger amputation, which can lead to disability. In this study, one case of eye injury that led to blindness and one

case of splenic injury that led to splenectomy indicate that mole guns can cause serious injuries and even disabilities.

Uner et al. reported an injury case in which a mole gun had been used as a trap by a homeowner for burglars in a flat.[2] He installed a mole gun device on the edge of the window. After two weeks, while a burglar had been attempting to break into the house, the burglar's right arm was injured by the mole gun and resulted in the loss of dorsoflexion at the wrist.

Demirci et al. reported 3 death cases caused by mole guns, 2 were accidental and the last 1 was suicidal.[1] Yilmaz et al. reported a case where a 4-year-old child was dead after being injured by a mole gun that had fired accidentally while the child was playing with it.[4] Our three death cases (cases 2, 3, and 4) were accidental whereas the fourth death case (case 1) was homicidal. A mole gun has no special handle for grasping it, but it is possible to grasp it by using any part of the gun or by attaching some simple parts to it. Thus, it is possible to use the gun for homicide as in our first case. Four cases presented in this study and the other cases presented in the literature verify that mole guns can cause accidental, suicidal and homicidal injuries, and even deaths.

In Turkey, rifles and smoothbores that have barrel lengths excluding the part of the cartridge, that are 30 cm or shorter and/or, including the part of the cartridge, that are 50 cm or shorter are included to Act 6136. Because these firearms are legally accepted as offensive and defensively aimed, keeping and carrying of these arms require a weapon license. Smoothbores with barrel lengths, excluding the part of the cartridge, that are longer than 30 cm and/or, including the part of the cartridge, that are longer than 50 cm, are included in Act 2521. These firearms' producing and using are legally accepted for sporting purposes.[6] Mole guns are not including in either of these Acts and there are no any legal arrangements concerning mole guns in Turkey. It is currently not illegal to produce, sell and/or keep a mole gun. Anyone who wants to own a mole gun can purchase one for $5 from an ironmonger.[1] Although mole guns are manufactured to be used as traps against detrimental animals and they are, strictly speaking, not designed to be used as firearms, the qualified opinions of experts have categorized these devices as prohibited firearms.[4]

CONCLUSION

More effective and safe devices have been developed to combat mole infestations. This device, named the "mole chaser", can deter moles by emitting ultrasonic waves and can be powered by battery or sun energy.[7] Mole gun production and use should be prohibited. Furthermore, farmers must be made aware that the "mole chaser" is a safer and more effective method for dealing with mole infestations than mole guns.

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