

Explode Metacarpal Bone by Gunshot: A Case Report

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ARTICLE INFO

Article Type:
Case Report

Article History:
Received: 28 Dec 2013
Revised: 3 Jan 2014
Accepted: 10 Feb 2014

Keywords:
Gunshot
Hand Injury
Medicine

ABSTRACT

Background: The incidence of firearm related non-fatal and fatal accidents has been increased worldwide. Most of the unintentional or intentional nonfatal gunshot injuries involve an extremity.

Case Report: A 33-year-old man was admitted to emergency department with a complaint of injury related to 5th metacarpal area of right hand. The patient reported that he is a police officer who suffered gunshot injury during crashes with smugglers in himself right hand. At arriving time into hospital, hand was neurologically intact and no vascular injury was noted. There was a distractive entrance wound in the 5th metacarpal hypothenar palmar area and a distractive exit wound on the dorsal side. The wound was irrigated and debrided. All loose bone fragments were removed. The loose area covered by distant flap of skin from the abdomen. All of the wounds were healed on postoperative 15th day.

Conclusion: This report is an attempt to present the problem of firearm injury and appeal to a wide range of disciplines working to expand their knowledge and redirect new energy to address the urgent problem of firearm injury.

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► *Implication for health policy/practice/research/medical education:* Explode Metacarpal Bone by Gunshot

► *Please cite this paper as:* Mostafazadeh B, Emamhadi MA, Shakeri M, Asadinejad N, Esmaeelzade A. Explode Metacarpal Bone by Gunshot: A Case Report. International Journal of Medical Toxicology and Forensic Medicine. 2014;4(4):154-7.

1. Introduction:

The incidence of firearm related non-fatal and fatal accidents has been increased worldwide. Most of the unintentional or intentional nonfatal gunshot injuries involve an extremity.

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2. Case Report:

A 33-years-old man was admitted to emergency department with a complaint of injury related to 5th metacarpal area of right hand. On detailed questioning, he reported that he is a police officer who suffered from gunshot injury during crashed with smugglers in his right hand by him-self gunshot. In the physical

examination, on his right hand, there was 4*2.5 cm full thickness skin defect on hypothenar area accompanying by bone distraction with superficial laceration on volar surface of 4th and 5th fingers (figure 1, 2 and 3). Neurological functions of all digits were normal. There was contributed fracture in 5th metacarpal bone and middle phalanx of 5th finger (fig. 1 and 2). All of the wound were washed and the patient transferred to operating room for debridement all Contusion and lacerated tissue, the fragmented bone was separated and the hypothenar region. Other small lacerations of the hand were sutured and defect of the soft tissue in injured region was covered with full thickness skin graft that transferred from the abdominal fascia (fig. 4-7). Cast immobilization was applied and intravenous antibiotic was adjusting post operatively.

2. Discussion:

The incidence of firearm related non-fatal and fatal accidents has been increased worldwide. Most of the unintentional or intentional nonfatal gunshot injuries involve an extremity (1). Most gunshot injuries to hands are results of low-velocity handguns. While low-energy firearm injuries are caused by small caliber handguns, BB (ball bearing) guns and zip guns, high energy firearm injuries are caused by high caliber handguns or assault rifles (2). The device is a German general-purpose machine gun and is short recoil operated, belt-fed, heavy-barreled, air-cooled machine that is suitable for bursts and sustained fire (2). The weapon and its derivatives have also been acquired by the armed forces of over 30 countries (1). All firearms, undergoing mechanical abrasion in the course of time, must be maintained periodically. Improperly maintained or unmaintained firearms become increasingly less reliable (3). Guns for other uses such as target shooting or defense should be cleaned routinely to ensure they are ready when needed. When a weapon is fired, the firing pin strikes the center of the primer cup, compressing the

primer composition between the cup and anvil and causing the composition to



Fig. 1. It shows bone destruction.



Fig. 2. It shows 5th metacarpal injury.



Fig. 3. It shows gunshot entrance and exit wound.

explode. The vents in the anvil allow the flame to pass through the flash hole(s) into



Fig. 4. It shows graftorigine.



Fig. 5. It shows hand graft.



Fig. 6. It shows posterior view of graft site.



Fig. 7. It shows graft procedure internal view.

the cartridge case and thereby igniting the propellant (3). It did not shoot when trigger was pulled but there mining bullet in the chamber was ignited when it was pushed by the rod through the barrel. After being ignited, bullet pushed the cleaning rod too fast and the rod caused his hand to be injured. There is no direct contact with bullet. Gunshot injuries to the hand can be classified according to the energy of the missile, the location of the injury, and the tissue types injured. These classification patterns are helpful for determining proper treatment modalities of gunshot injuries to the hand. However, each injury must be evaluated on an individual basis (4). As the weapon is a machine gun, it is normally more likely to cause a high energy injury even resulting in death. The case presented here is an exception as he is injured himself by his gun during fighting but not the bullet. But all persons who are taking care

of firearms should be aware of this problem as the different barrel. Low-velocity gunshot wounds usually involve only the skin, subcutaneous and/or muscle tissue, and minor cortical bone fragments (3). Although most low-velocity gunshot wounds to the hand can be closed primarily under some conditions, this is not recommended in high-velocity injuries because of involving multiple tissue types such as skin, muscle, bone and joint, and nerve (4). High velocity gunshot wounds require immediate irrigation, removal of foreign bodies, skeletal stabilization, intravenous antibiotics, serial debridement, and secondary wound closure within 5 to 7 days after injury followed by timely postoperative rehabilitation. Low-velocity gunshot wounds are usually treated with local wound care consisting of superficial irrigation and careful cleansing, cast immobilization, a short course of oral or

intravenous antibiotics, and close follow-up. In our case, there was 5th finger fracture on X-ray. Soft tissue defects on the hand were repaired with local flap, skin graft.

3. Conclusions:

This report is an attempt to present the problem of firearm injury and appeal to a wide range of disciplines working in the areas of medicine, law, social services, and public health to expand their knowledge and redirect new energy to address the urgent problem of firearm injury. As well as to minimize the impact of firearm-related threats and injury on vulnerable youth, families and communities.

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