«MINE-EXPLOSIVE INJURIES. DOMESTIC MEDICAL ASSISTANCE TO THE CIVILIAN POPULATION IN CONDITIONS OF WAR»

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Blast injuries are one of the most serious wartime injuries. In the article you will find advice from an expert that will help save lives. In particular, you will learn how to protect yourself from explosions and how to properly provide first aid to a victim.

Mine-explosive injuries are combined injuries resulting from the impulse impact of a complex of impressive factors of a mine-explosive munition. In peacetime, accidental or intentional explosions of mine gas can occur in mines, containers with gas or explosive substances, tanks with fuel or gaseous contents, gas tanks, gas pipelines, food pipelines.

In wartime, a person can be injured during explosions of military munitions: grenades, mines, fuses, shells accidentally found by children or those used maliciously by terrorists. Mines and most mass-produced explosive devices consist of an explosive substance and a metal casing. During the detonation of the explosive, the metal shell breaks and many small metal fragments are formed. Fragments and explosion can injure a person.

Types of mine-explosive injuries:

1. Primary. Such injuries (contusions) are the result of a shock or blast wave. The detonation of high-energy explosives creates a wave in air or water. The wave causes rapid and significant changes in the external atmospheric pressure: rarefaction occurs behind the shock wave of increased pressure. Immediately behind the pressure wave, the movement of the air mass is observed - an explosive wave.

As a result of the impact of the blast wave, a person may not have any visible external damage.The blast wave affects all human organs, especially those that normally contain air. Hollow organs are at greatest risk of injury because injuries tend to occur at tissue-liquid, tissue-gas, or tissue-tendon interfaces.

Most sensitive to this type of damage:

- middle and inner ear — rupture of the tympanic membrane;
- lungs - "explosive lung";
- gastrointestinal tract.

2. Secondary. Occur as a result of contact with fragments of an explosive device or fragments of auxiliary materials flying away as a result of an explosion. These injuries are mostly penetrating, blunt injuries of a certain degree are also possible.

3. Tertiary. Caused by the direct impact of the blast wave.

The blast wave can completely destroy the body of a person who is close to the place of the explosion. Traumatic amputation and loss of internal organs can occur at some distance from the explosion site.

The blast wave can destroy buildings, throw people, who are injured as a result of falling to the ground or hitting stationary structures. There may also be injuries due to the destruction of structures.

4. The fourth type. Concomitant lesions as a result of burns, poisoning by carbon monoxide and poisonous gases, as well as from inhalation of dust, smoke or pollutants, heat and in the case of a nuclear explosion, the effects of radiation.

At the beginning of the explosion, a shock wave acts on the body. The greater the amount of explosives and the closer a person is to the device, the more severe the injury will be. The result can be significant injuries to internal organs, bone fractures, traumatic amputations, crushing of soft tissues.

During the explosion, a fireball is formed, which can cause burns. Most often, these are open parts of the body - the face, hands. A person can get ENT contusions. Gaseous explosion products, which are formed during the explosion, also have a toxic effect on the body.

Characteristics of damage factors in blast injury:

- an air shock wave, which creates the greatest traumatic effect on the body, tears off segments or causes severe damage to limbs, as well as damages soft tissues, blood vessels and nerve trunks, leads to hemorrhages, contusions in all organs and tissues;
- primary (ammunition fragments) and secondary (stones, fragments of protective armor, machine parts) damage elements cause wounds of different localization;
- gas jets formed as a result of an explosion and spreading at high speed. They are able to cause a strong damaging effect, which is accompanied by the detachment or extensive destruction of segments of limbs and other parts of the body. Gas jets, which are formed during the explosion of cumulative projectiles and high-explosion ammunition, have a particularly strong damaging effect;
- the flame from the explosion causes primary and secondary (from clothing catching fire) burns;
- explosion and combustion products can cause carbon monoxide poisoning and other toxic chemicals.

Severe injuries are noted in victims who received explosive injuries as a result of detonation of an anti-tank mine of combat equipment or transport, as well as when they were hit by cumulative projectiles. At the moment of the mine explosion, the armored vehicle is thrown up sharply, the crew members who are in it receive a strong blow from below and together with the armored vehicle they are thrown up, during the fall of the vehicle there is an impact on the ground, while people often have closed injuries of the pelvic bones, limbs and spine.

As a result of the explosion of the munition with a cumulative effect, highly compressed, high-temperature gas jets appear, which penetrate the interior of the armored vehicle at a high speed, creating excess pressure, which leads to barotrauma, and a large number of fragments from the destroyed armor appear, causing severe injuries to the crew members and numerous injuries.

After the explosion, fragments are formed, which fly in different directions at high speed and cause injuries. Fragments are usually of an irregular shape, so the wounds have a ragged nature. The localization of wounds and their severity depends on the distance a person is from the epicenter of the explosion. Also, as a result of the explosion, building structures may collapse, stones and other secondary fragments may fly away, so the victim may have injuries caused by the action of their small parts. In most cases, such injuries have a multiple fragmentary nature.

A complex burn-traumatic shock can develop with mine-explosive injuries. Bleeding from damaged tissues and organs can lead to disruption of blood flow through vessels and oxygen transport. Then a longer and more severe burn shock appears.

Rapid assessment of the condition of the wounded:

- remember your own safety. Examine the victim and give him help only in that case when there is no obvious threat. Assess the situation, apply attention to suspicious objects around.
- conduct a visual inspection of the victim and the place around him Pay attention to the presence of bleeding, visible damage, position and behavior of the victim. Massive bleeding can be indicated by a stream of blood, which pulsating or a red spot near the victim that quickly Increases
- establish contact with the victim – ask question. If you receive an answer - the victim consciousness, airways are open, breathing is present. If does not have an answer - consciousness and breathing may be impaired.
- In case an external was found during the quick assessment massive bleeding, it should be stopped quickly using one of the methods described below. In the event that the bleeding is absent or has stopped, follow proceed to the initial examination of the victim.

There are two types of bleeding: internal and external.

Internal bleeding occurs when the internal organs are damagedтthoracic and/or abdominal organs. Visually her cannot be determined. About the presence of internal bleedingьmay indicate the presence of shock. Its signs are: general weakness, dizziness, loss of consciousness, pale, cold, moist skin, frequent breathing. In the presence of these symptoms, the victim needs to be treated as quickly as possible hospitalize.

External bleeding is bleeding from a wound. Allocate external bleeding of three types: capillary, venous, arterial.

A rapid loss of blood in quantity is dangerous for a person 35% or more of its total volume. Total blood volume is 7% of body weight (amount of blood (l) = 7% of body weight). Using this formula, anyone can quickly determine the volume of blood in the body.

For example, in a person weighing 70 kg, the blood volume will be: 70x7/100 = 4.9 l (≈ 5 l)

The critical loss will be: 5x35/100 = 1.8 liters of blood.

The main rules for applying CAT:

• apply a tourniquet only in case of massive bleeding;

• no need to remove or cut clothing when applying tourniquet – place the tourniquet on top of the clothing, but make sure that he will be above the wound. Don't waste time, remember speed bleeding;

• when applying the tourniquet, exert maximum pressure until full stopping bleeding from the wound;

• you cannot put the tourniquet on the knee and elbow - it will be there ineffective, the vessels are hidden between the bones;

• do not put the harness on the places of the pockets, if there are things therehey will reduce the harness pressure and not give completely constrict blood vessels;

• if you have a first-aid kit, the harness should be in it accessible place;

• do not cover the harness with clothes or other things;

• it may take several to stop bleeding completely harnesses;

• if possible, the tourniquet should be applied 5-6 cm higher wounds;

• if you do not see the source of bleeding (wound), you should apply harness as high as possible on the limb;

Mine-explosive trauma (MVT) is a combined gunshot trauma (polytrauma) that occurs in a person as a result of the impulse impact of a complex of striking factors of explosive ammunition. mvt is characterized by the interconnected impact of deep and significant tissue damage with the simultaneous development of a general contusion-concussion syndrome (contusion from the Latin contusio - a bruise that causes trauma - concussion (the same as a concussion). concussions are characterized by general brain symptoms, in particular, loss of consciousness, headache, dizziness , vomiting, convulsions, etc.

Modern medical triage of victims as a result of hostilities requires application of the cluster principle, which makes it possible to unify clinical picture of damage. The developed comprehensive standardized system enables an objective assessment of severity damage and condition of the victim and is a probable basis for adequate medical triage.

We have developed the principles of medical sorting by cluster characteristics depending on It is possible and appropriate to use the indicator of the standardized GKO system in patients with closed and open injuries as a result of modern warfare, especially with a mass influx of wounded. Defining and sorting the cluster of victims makes it possible to apply an effective and adequate approach scope and nature of medical assistance to victims, especially at the tactical and early hospital stage of providing medical assistance.

In the case of mine-explosive injuries, use first-line emergency measures.

1. Make sure there is no danger to you and the victim at the scene.

2. As soon as possible, call emergency medical help by calling "103" or "112".

3. Examine the victim. Pay attention to whether he is bleeding, visible injuries, how he lies and how he behaves. Massive bleeding can be indicated by a stream of blood that pulsates or a red spot near the injured person that grows rapidly. If there is bleeding, stop it immediately.

4. Assess and secure airway. For example, open the victim's mouth; listen to his breathing.

5. Check the victim for shock.

Signs of shock: weakness, dizziness; pale, clammy and cold skin, loss of consciousness.

6. If, even after stopping the bleeding and ensuring the patency of the respiratory tract, the injured person does not show signs of life, start cardiopulmonary resuscitation. To do this, put the victim on his back and press in the middle of the chest with two hands, covering the base of one palm with the other palm. The depth of pressing should be 5-6 cm. The frequency of pressing is 100-120 per minute.

7. Cover the victim with a blanket or a special thermal blanket to prevent hypothermia. It is important that the injured person does not lie on a cold, wet surface.

8. Constantly monitor the condition of the victim until emergency medical assistance arrives.

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