First aid for chest injuries

Chest injuries are always associated with respiratory insufficiency. Symptoms are pain, often related to breathing,shortness of breath, coughing, possibly coughing up blood, shallow breathing, abnormal chest shape, abnormal chest movements, change in skin color(cyanosis), shock, external signs of injury.

It can be rib fractures (simple, serial, unstable chest), pneumothorax, contusion of the chest, chest wall or internal organs – lungs and heart, bleeding into the chest (hemothorax), bleeding into the pericardium (hemopericard - causes cardiac tamponade and subsequent circulatory arrest), injury to large vessels (resulting in hemothorax), injury to airways and esophagus. When administering first aid, we stabilize the injured in a semi-sitting position with support for the upper half of the body, fix the arm on the injured side in a sling, stabilize the chest wall with an elastic bandage – only in the case of an unstable chest, in case of impaired consciousness we choose a stabilized position on the injured side. If necessary, we will perform heart massage and artificial respiration (cardiopulmonary resuscitation – CPR), call the emergency medical service.

Rib fractures

They are accompanied by significant pain and often shortness of breath (movement limited by pain). Serial fractures are when more than three ribs are fractured one above the other (breathing problems), serial fractures in 2 lines cause a heaving chest with the development of paradoxical breathing. First aid is performed in a semi-sitting position with the chest supported or lying on the side on the injured side, we reduce the mobility of the injured side with a bandage or attached upper limb and fix it with a scarf bandage.

Hemothorax

It is bleeding into the pleural cavity, most often from the intercostal arteries, less often from the lungs, heart and large vessels. Bleeding over 1000ml will cause signs of hemorrhagic shock. We will perform anti-shock measures, possibly breathing support. We can observe a very fast pulse, tachypnea to dyspnea, unconsciousness to arrest.

Pneumothorax

In pneumothorax, air enters the pleural cavity from an injured lung or bronchi, from the esophagus or when the chest cavity communicates with the outside. There is a complete collapse of the lung on the affected side with respiratory insufficiency. It is manifested by shortness of breath, cyanosis, the development of shock, subcutaneous emphysema may occur (abnormal permanent expansion of the airways peripherally from the terminal bronchioles associated with the destruction of their walls without the presence of fibrosis).

- **Open pneumothorax** – there is permanent communication of the pleural cavity with the atmosphere and air flow, sometimes there is a flutter of the mediastinum. If the affected person is conscious, we place him in a comfortable semi-sitting position with back and head support. On the injured side, we fix the limb in a sling. We close the opening in the chest by applying a semi-breathable bandage - e.g. a plastic mask, to which we stick strips of plaster on three sides, leaving the bottom side unglued (this prevents further air intake, on the contrary, air can escape). If the affected person is unconscious, after treating the wound, we place him in a stabilized position on the injured side. We will check the physiological functions and call the emergency medical service.
- **Closed pneumothorax** – occurs when the lung bursts or breaks the chest wall, when the hole closes itself, so that the cavity does not communicate with the atmosphere. However, there is air in the cavity. The condition is not getting worse. If the affected person is conscious, we place him in a comfortable semi-sitting position with back and head support. On the injured side, we fix the limb in a sling. If the victim is unconscious, we place him in a stabilized position on the injured side. We need to ensure timely transportation.
- **Valvular pneumothorax** – air flows in only during inhalation, the hole closes during exhalation. Air accumulates in the cavity and the lung collapses. We observe a major deterioration over time. The pressure on the heart (which is pressed against the healthy lung by the enlarging air pocket, thereby restricting it in diastole and causing a decrease in cardiac output) increases and shock occurs. The chest on the affected side does not move and arches. An immediate puncture of the chest with a needle or cannula is necessary in the 2nd-3rd. intercostals in the anterior axillary line. Only if we are sure that it is not a hemothorax! We will verify by listening and knocking. By puncturing the hemothorax, we cause blood to flow out, which is replaced by additional blood from internal bleeding. This intervention will cause serious complications to the patient, for example hypovolemic shock.

When performing first aid, we always check basic vital functions and try to ensure professional help and quick transport to a medical facility by calling an emergency medical service.

Links

Related articles

- Rib fractures

References

- KELNAROVÁ, Jarmila, et al. *První pomoc. II : Pro studenty zdravotnických oborů.* 1. edition. Praha : Grada Publishing, 2007. 184 pp. ISBN 9788024721835.
- ŠEVČÍK, P. – ČERNÝ, V. – VÍTOVEC, J.. *Intenzívní medicína : Souhrn přednášek ke kurzu Lékařská první pomoc.* 2. edition. Praha : Galén, 2005. 169 pp.