

Features of Damage to the Head and Spine

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Abstract: A forensic medical examination of 82 corpses, persons who died as a result of falls from a height. The victims are aged from 16 to 66 years. It was found that the set of injuries in persons affected by falls from a height differ in severity and is characterized by the formation of most often (80.5%) CT more than two parts of the body. TBI (68.5%) and PSMI (30.5%), as well as damage to the bones of the extremities and their structure (30.1%), predominate in the composition of CT when falling from a height.

When falling from a height, TBI is accompanied by multiple fractures of the bones of the vault and the base of the skull, which indicate that they occur when falling with a landing on the head. PSMI covered all parts of the spine and they often had a compression character, resulting from falls on the legs. Of the forearm and femur bones were relatively more frequent, and fractures of the humerus (right) and lower leg bones (left) were relatively less frequent. The nature of fractures of the femur and lower leg bones indicated their formation when falling on the legs.

These data can be taken into account to establish the mechanogenesis of multiple injuries in conditions where they are not obvious.

Key points: falls from height, combined injury, head, spine, limbs.

Injuries resulting from falls from a height have now become the most common types of blunt mechanical trauma in all regions of the world [9]. In this regard, the medical and social aspects of this injury attract the attention of medical researchers. A lot of scientific work by forensic scientists is devoted to the issues of biomechanics of injury and assessment of the mechanism of damage that occurs during a fall [1,7]. It is emphasized that the nature of the formation of damage to organs and tissues during falls is determined by many conditions and factors that influence the mechanogenesis of injury [4]. The head, spine and limbs are most vulnerable to injury from various types of blunt trauma [2,3,5,10]. Despite this, the nature and features of the formation of damage to these structures for the tasks of forensic medical examination in the differential diagnosis of various types of blunt mechanical trauma have not been sufficiently studied [6].

Purpose of the study. To determine the nature and features of the formation of injuries to the head, spine and limbs in persons injured as a result of falls from height.

Materials and methods of research. A forensic medical examination was carried out on 82 corpses and persons who died as a result of falls from a height. The age of the victims was mainly from 16 to 66 years (80), in two cases the age of the victims was 80 and 84 years. Among the dead were 64 men and 18 women. The height of the falls varied from several to tens of meters. Circumstances of the falls: falls from windows and roofs of 4-5 and 6-8 storey buildings - 78, falls from a pole - 1, from a carousel - 1, from a walnut tree - 1. According to the preliminary investigation, in all cases there was a free fall without preliminary acceleration (passive fall). In 48 cases, the death of the victims occurred at the scene of injury, in the remaining 34 cases - in hospitals on 1-3 days.

Results and discussions. The totality of injuries in persons injured in falls from a height is characterized by severity and is characterized by the formation, most often (66 cases out of 82), of a

combined injury (CT) of more than two parts of the body. In this case, combinations of traumatic brain injury (TBI) with injuries to other parts of the body prevailed. Isolated TBI was detected in 5 cases and CT of two parts of the body was noted in 11 cases.

The table shows that in 68.5% of cases (56 out of 82 observations), victims of falls from a height have a severe head injury, which is often accompanied by multiple fractures of the bones of the vault and base of the skull (36 out of 56 cases). Moreover, in 4 cases, in addition to fractures of the bones of the vault and base of the skull, fractures of the bones of the facial part of the skull were also noted. TBI was most often combined with injury to the following body parts: chest and abdomen (20), chest, abdomen and extremities (6), spine, chest and abdomen (6), chest, abdomen, pelvis and extremities (6), and spine, chest, abdomen, pelvis and limbs (4). TBI victims were characterized by massive intrathecal hemorrhages and contusion lesions in various parts of the brain. TBI in victims in most cases occurred as local primary injuries caused by the victims falling on their heads.

As part of ST in falls, spinal cord injury (SCI) was noted in 30.5% of cases (25 out of 82). SCI was often combined with trauma to the head, chest, abdomen and extremities (6), chest and abdomen (7), head, chest, abdomen, pelvis and extremities (6). SCI often involved 2 or more parts of the spine, and according to location were characterized by: cervical-occipital injury (C1-C2) - 4, lower cervical (C3-C7) - 7, upper thoracic (T1-T4) - 4, lower thoracic - 9, lumbar - L1-L2(3), L3-L5 (5). In 15 cases (out of 25), compression fractures of the vertebrae were noted, rotational - 7, distraction fractures - 3. In 3 cases, there was a complete separation of the spinal cord in the cervical (2) and thoracic (1) regions. SCI, as isolated injuries, can be observed in any type of landing of a fall, however, compression fractures of the spine were the result of victims falling on their feet.

Damage to the bones of the extremities was detected in 25 cases (30.1%). The table shows that relatively more often there were fractures of the bones of the forearms, femurs, right humerus and bones of the left leg. These fractures were most often diaphyseal and more often comminuted with displacement; epiphyseal and intra-articular fractures were observed in the ankle and wrist joints (typical fractures) relatively less frequently. Fractures of the bones of the right and left limbs of the victims occurred to the same extent.

The nature of the volume and localization of local primary and remote damage during a free fall from a height depend on landing options. Damage to various parts of the head mainly occurs as local primary damage when falling from a height and landing on the head. At the same time, at the same time as the head, the arms are also more often damaged, since at the moment of landing, the victims put them out for self-defense. Injuries to the femurs and shin bones occur mainly when landing on the feet, as distant injuries, and injuries to the feet and ankle joints - as primary local injuries. At the same time, spinal injuries, as well as distant injuries, can be observed in various landing options [7]. In our observation, fractures of the bones of the lower extremities also occurred mainly when the victims fell on their feet, and fractures of the bones of the upper extremities - during various landings of the victims.

The variety of combinations of injuries and disorders that occur in the body during TS as a result of falls from a height require the search for modern methods for early diagnosis and rational methods of treatment aimed at reducing mortality and disability [8]. The results of our research also showed the variety of variants of TS in victims, which is due to the high frequency of falls and variants of landing deaths.

Conclusions. The totality of injuries in persons injured in falls from a height is characterized by severity and is most often characterized by the formation (80.5%) of ST in more than two parts of the body. In the composition of CT in falls from a height, TBI (68.5%) and SCI (30.5%), as well as damage to the bones of the extremities and their structure (30.1%) predominate. In falls from a height, TBI is accompanied by multiple fractures of the bones of the vault and base of the skull, which indicates that they occur during falls, mainly landing on the head. SCIs involved all parts of the spine, and they were often of a compressive nature resulting from falls on the legs. Fractures of the forearm and femur bones were observed relatively more often, and fractures of the humerus (on

the right) and shin bones (on the left) were relatively less common. The nature of the fractures of the femur and shin bones indicated their formation during falls on their feet, and fractures of the bones of the upper extremities can be observed in various types of landings of victims with TS.

The data presented can be taken into account in the process of forensic medical examination of fatal falls from height, as well as in the organization and provision of emergency and specialized medical care to victims.

Literature

1. Zarubina S.V. Forensic medical assessment of injuries arising from a fall on a plane and its biomechanical aspects // Abstract of thesis. dis. Candidate of Medical Sciences Sci. Barnaul, 2006.
2. Kaikov A.K. Grin A.A. Purulent-septic complications in operated patients with spinal trauma.//Proc. report All-Russian scientific-practical conf. "Polenov Readings". S.-Pb. 2009. pp. 89-90.
3. Kryukov V.N., Sarkisyan B.A., Yankovsky V.E., Novoselov V.P., Zorkin A.I., Shadymov A.B., Bastuev N.V. Diagnosis of causes of death due to mechanical damage. T7: Causes of death due to mechanical damage. – Novosibirsk. Science, 2003.T.7. 131 p.
4. Kulinkovich K.Yu. Kutsenko K.I. Morphological features and mechanism of damage formation when falling from a high-rise building // Forensic medical examination. - M., 2017. No. 1.S. 36-38.
5. Mlyavykh S.G. Surgical tactics for unstable isolated and combined injuries of the thoracic and lumbar spine: Abstract of thesis. Ph.D. med. sc. M., 2009. 27 p.
6. Pavlova G.V. Morphological characteristics and forensic medical assessment of neck injuries caused by a fall from a height//Author's abstract. dis. Candidate of Medical Sciences Sciences St. Petersburg, 2005. 20 p.
7. Solokhin A.A., Solokhin Yu.A. Forensic medical aspects of injury from a fall from a height. M: Folium.1993, 64 p.
8. Shapkin Yu.T., Seliverstov P.A., Skripal E.A., Kochetov Yu.V., Gavrilov A.V. Risk factors for death in severe combined trauma with skeletal injuries. News of higher educational institutions. Volga region. Medical Sciences, No. 2 (42), 2017.
9. Beale JP, Wyatt JP, Beard D, BusuttillA, Graham CA. A five year study of high falls in Edinburgh. Injury. 2000, №31.P.503-8.
10. Finnern H.W., D.P. Sykes, The hospital cost of vertebral fractures in the EU: estimates using national datasets, Osteoporos. Int.2003.№14.P. 429–436.