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FORENSIC MEDICAL ASSESSMENT OF MORPHOFUNCTIONAL CHANGES IN THE LIVER IN CLOSED WOUNDS OF THE ABDOMINAL CAVITY

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Annotation. Promising in solving the forensic medical determination of the circumstances of blunt trauma (type of impact, direction, force and area of the traumatic surface) based on the morphology of liver injuries is an in-depth study of the issues of the formation mechanism and the establishment of the morphological characteristics of local and distant liver injuries. The location and severity of liver injuries provide valuable information about the conditions of blunt abdominal trauma. The search for morphological equivalents of the processes of compression, stretching and shear in liver injuries seems important for solving forensic issues.

Key words: forensic medicine, trauma, abdominal cavity, liver, morphology.

Relevance. In population mortality statistics, death from various types of injury occupies one of the leading places. Injuries from blunt objects come first in household, street, and sports injuries, and are most often encountered in the practice of a forensic doctor. A quarter of all cases of violent death are caused by fatal injuries caused by hard, blunt objects, which makes this type of death the first place among all cases of violent death. At the same time, closed blunt trauma to the abdomen, as the main cause of death, is in third place after closed blunt trauma to the head and combined blunt trauma to the body [1].

Considering the huge variety of blunt hard objects, it is clear that the damage caused by them is no less varied. So, for example, damage caused by the striking surface of a hammer, or the butt of an ax, differs significantly from damage that can be caused by unarmed parts of the human body (knee, foot shod in soft shoes, hand, etc.). Depending on the density of the traumatic object, the strength of the traumatic impact, the presence or absence of clothing on the victim's body, external damage may sometimes be absent. This circumstance, as a rule, leads to the fact that at the scene of the incident, a specialist in the field of forensic medical examination cannot resolve the issue of the violent nature of death. This, in turn, does not allow the investigative authorities to carry out appropriate operational investigative measures and solve the crime at the early stages of the preliminary investigation [2].

The frequency of damage to internal organs is determined by their location. The liver is located close to the surface of the body and is large, so it is often damaged [3]. One of the questions put to the expert's permission is the question of the conditions for causing blunt trauma: as a result of compression, impact, during a fall, etc. [4]. According to some authors, in most cases, liver damage is of little information, since the morphological features of the damage are determined by the extent of damage to its tissue and depend on the safety of the capsule. According to others, the morphology of liver damage can be used for forensic diagnosis of the mechanism of injury [3].

Traumatic liver injuries include detachment of the capsule from the parenchyma by a subcapsular hematoma, ruptures of the parenchyma with damage to the capsule, penetrating the tissue to varying depths, and central ruptures of the liver [4, 5]. Lacerations are essentially closed contused wounds of internal organs. Tears are divided into direct and indirect (distant), complete and incomplete [6,7]. Direct ruptures are formed at the site of impact or compression of an organ through the abdominal wall, or due to damage to the organ by fragments of ribs. The shape and number of breaks can be very diverse. Isolated ruptures are observed more often with punches or kicks. Extensive multiple injuries to several organs are typical for injuries from falling from a great height, landslides, or being crushed by parts of a tram or train. In such cases, crushing, separation and displacement of internal organs may occur [8].

Indirect ruptures form in areas remote from the point of application of force, most often on the opposite side. The cause of such ruptures is the displacement of the organ and its impact on the spinal column, stretching of the tissue due to deformation or shaking of the organ [10]. Such a characteristic of liver damage shows the dependence of the volume of destruction of internal organs on the conditions of injury, but cannot be used to solve specific expert problems [11], since the specific morphological equivalents of some standard conditions for the occurrence of injury remain unknown: impact, compression, concussion. In cases of impact with a blunt object in the liver area from front to back, liver damage is localized mainly at the site of application of external force with the direction of ruptures from the point of impact from front to back. Characteristic features are hemorrhages under the capsule of the diaphragmatic surface of the liver at the border of its lobes and ruptures of the anterior edge of the right lobe of the liver [6-8].

Damage resulting from a blow from back to front is similar to damage from a blow to the front surface of the body, but with a different direction of rupture. Tears of the right lobe (also, mainly, of its diaphragmatic surface) are of great extent and pass from the diaphragmatic surface of the lobe through the posterior edge to its visceral surface [6-8]. Impacts with a blunt object to the liver area in the anteroposterior or posteroanterior direction cause deformation of the liver with the formation of distant ruptures of the capsule and parenchyma, as well as hemorrhages and central ruptures (deep in the organ) [9-11]. When struck from right to left, tears are formed on the right lobe of the liver and are directed from right to left along the length of the liver. From a blow of great force, several deep ruptures are formed with their direction in the direction of the action of the traumatic object.

A strong blow with compression from the front leads to the formation of more extensive subcapsular hematomas and ruptures of the liver, damage to the ligaments with their ruptures and separation [7,8]. In cases of exposure of the human body to massive blunt solid objects (transport trauma), there is a variety of morphological manifestations and localization of liver damage, which are formed under the influence of various types of deformation. Ruptures and crushing of liver tissue are formed at the site of application of external force; they have a varied shape with directionality, often determined by the direction of movement of the object. The length of the ruptures varies - from several centimeters to complete separation of the organ [8].

The morphology of liver injuries resulting from a fall from a height is similar to injuries resulting from impact with massive blunt objects, but with greater severity of damage from body concussion and impact injuries, as well as pronounced central ruptures [9].

Gross destruction of the liver occurs at the site of its direct injury - ruptures of varying length and depth are formed, with superficial cracks extending from them, with interstitial bridges in depth and areas of tissue crushing at the edges, damage to liver tissue in the area of the gallbladder bed, crushing, destruction of parenchyma in central (deep) parts of the liver.

Characterized by local subcapsular hemorrhages without violating the integrity of the capsule, multiple superficial ruptures of both lobes of the liver of various directions, resulting from general deformation of the organ. There are cases of local liver damage in the form of central ruptures with tissue crushing in this area without any collateral damage to other parts of the organ [5-8].

Liver damage from body compression is very common. Usually this is severe tissue injury with the formation of extensive peripheral and central ruptures, up to complete division of the liver into two halves. Ruptures (often multiple) occur along both the diaphragmatic and visceral surfaces of the liver. Along the edges of the ruptures, extensive detachment of the capsule is noted, with the formation of cavities filled with blood. Some of these cavities may be located isolated outside the main damage. Typically, crushing of the central parts of the right lobe of the liver with the formation of a large cavity filled with detritus soaked in blood, with rupture of large intrahepatic bile ducts and vessels. Multiple linear breaks go from the central breaks to the periphery [7,8].

The given morphological characteristics of liver injuries may turn out to be uninformative and unsuitable for solving expert problems if the incident is not obvious, since while there are quantitative characteristics, there are no qualitative characteristics that would allow differentiating liver ruptures from different types of traumatic effects. Thus, the standard conditions for blunt trauma causing liver injury are impact, compression, and general shock to the body. These effects cause the formation of local and distant liver damage, damage to the liver ligaments and other organs and tissues [13].

The study of the complex of injuries accompanying closed blunt abdominal trauma is a topical problem not only in the practice of clinical healthcare (surgery, traumatology, resuscitation), but also among morphologists during autopsy examination of material discovered during the forensic medical examination of corpses.

Promising in solving the forensic medical determination of the circumstances of blunt trauma (type of impact, direction, force and area of the traumatic surface) based on the morphology of liver injuries is an in-depth study of the issues of the formation mechanism and the establishment of the morphological characteristics of local and distant liver injuries.

Literature

1. Бабкина Е. П., Долотин С. А. О возможностях давности причинения травм и времени смерти по динамике изменения температурных показателей печени //Судебная медицина. – 2017. – Т. 3. – №. 4. – С. 8-11.
2. Бабкина О.П., Долотин С.О. Установление зависимости от давности травмы и времени смерти динамики изменения температурных характеристик печени //Российский журнал судебной медицины. – 2017. – Т. 3. – №. 4. – С. 8-11.
3. Дубровина И. А. О механизме непрямого разрыва печени при тупой травме //Медицинская экспертиза и право. – 2017. – №. 4. – С. 34-38.
4. Караваев В. М. и др. Сравнительная характеристика морфологических проявлений травмы живота у детей разных возрастных групп и взрослых при смертельной сочетанной травме //Скорая медицинская помощь. – 2015. – Т. 16. – №. 2. – С. 23-29.
5. Норов М. Ч. ОПЫТ КОНСЕРВАТИВНОГО И ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ ПОВРЕЖДЕНИЯ ПАРЕНХИМАТОЗНЫХ ОРГАНОВ БРЮШНОЙ ПОЛОСТИ //SUSTAINABILITY OF EDUCATION, SOCIO-ECONOMIC SCIENCE THEORY. – 2024. – Т. 2. – №. 14. – С. 189-191.
6. Пиголкин Юрий Иванович, Дубровина И.А., Николенко В.Н., Дубровин И.А. Судебно-медицинская оценка условий тупой травмы живота по повреждениям печени // Вестник Авиценны. 2014. №1 (58). URL:

https://cyberleninka.ru/article/n/sudebno-meditsinkova-otsenka-usloviy-tupoy-travmy-zhivota-po-povrezhdeniyam-pecheni (дата обращения: 25.04.2024).
7. Пиголкин Ю. И., Дубровина И. А., Дубровин И. А. СУДЕБНО-МЕДИЦИНСКАЯ ОЦЕНКА РАЗРЫВОВ ПЕЧЕНИ ПРИ ТУПОЙ ТРАВМЕ. – 2017.
8. Подолужный В. И. и др. Травматические повреждения печени //Политравма. – 2023. – №. 1. – С. 34-38.
9. Романова А. В. Сравнительный анализ эффективности алгоритмов лучевой диагностики при травме живота //Радиология–практика. – 2024. – №. 3. – С. 15-23.
10. Саковчук О. А. Экспертная оценка повреждений паренхиматозных органов живота при травме тупыми предметами //Вестник судебной медицины. – 2015. – Т. 20015. – №. 4. – С. 2.
11. Сигуа Б. В., Земляной В. П., Дюков А. К. Сочетанная и изолированная травма живота с повреждением печени //Вестник хирургии имени ИИ Грекова. – 2015. – Т. 174. – №. 1. – С. 9-15.
12. Хван О. И. Повреждения печени, селезенки и почек при тупой травме и их судебно-медицинская оценка //Проблемы экспертизы в медицине. – 2016. – Т. 16. – №. 1-2 (61-62). – С. 20-24.
13. Хван О. И. тупая травма живота при несмертельной автомобильной травме //Проблемы экспертизы в медицине. – 2015. – Т. 15. – №. 1-2 (57-58). – С. 20-22.
14. Dubrovina I. A. et al. Morphogenesis of central and peripheral liver ruptures in blunt-force trauma //Sudebno-meditsinskaia Ekspertiza. – 2019. – Т. 62. – №. 3. – С. 28-32.
15. Khvan O. I., Don A. N. About closed liver injury in automobile traumas with lethal outcome //Новости образования: исследование в XXI веке. – 2023. – Т. 1. – №. 6. – С. 236-241.
16. PIGOLKIN Y. U. I. et al. Судебно-медицинская характеристика разрывов печени при внутрисалонной травме у водителя //ЭКСПЕРТИЗА. – 2015. – С. 12.