

Characteristics of the Age of Traumatic Brain Injury

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Abstract: The article is devoted to the limitation of traumatic brain injury. Morphologically, they often manifested as epi-, subdural, and subarachnoid hemorrhages. By the nature of morphological changes, in particular, the state of hemorrhage, the presence of a convolution, color, organization or resorption, density and a number of other signs, it is possible to definitely establish the prescription of injury.

Keywords: traumatic brain injury, morphological changes, prescription of injury.

Relevance. In the modern world, due to the increase in exogenous factors affecting human health, increased traumatization of the population has been noted, with traumatic brain injury being singled out in the structure of mechanical injuries [2]. Which is most often observed as a result of a road traffic accident and mainly in people of working age [5,9,16].

In this case, the greatest difficulties for both clinicians and forensic experts, along with assessing the severity of traumatic brain injury, are establishing the time of traumatic brain injury [10,14]. Difficulties are also caused by the presence of concomitant diseases (atherosclerosis, hypertension, ischemic heart disease, etc.) [7,8]. In particular, diagnostic errors in the provision of medical care are the cause of incorrect forensic classification of harm caused to human health [3,11,12]. Therefore, these circumstances explain the need to improve the diagnosis of traumatic brain injury [13,15]. Установление давности нанесения черепно-мозговой травмы имеет важное значение при расследования преступлений против здоровья и жизни человека, и поэтому правоохранительными органами на разрешении судебно-медицинской экспертизы постоянно ставят этот вопрос [1,4,6].

The aim of the study was to establish the duration of traumatic brain injury based on morphological changes in hemorrhages.

Material and methods of the study. We conducted a retrospective analysis of 40 forensic medical examination reports on corpses that died from craniocerebral trauma, conducted at the Samarkand regional branch of the Republican scientific and practical center of forensic medical examination.

Research results and their discussion. The obtained data indicate that traumatic brain injury in the gender aspect was more often detected in men 34 (85%) than in women 6 (15%). In the age aspect by groups, it was more often noted in people of working age (75%). Traumatic brain injury was of a combined nature (67%) than combined (24%) and isolated (9%).

Morphological changes in the brain during traumatic brain injury were very diverse due to the differences in the physical conditions of its occurrence and the complexity of the topography of intracranial structures.

Morphological manifestations of traumatic brain injury were as follows:

1) Focal contusions and crushing injuries. Destruction of brain tissue with formation of detritus, hemorrhages (large or small focal, rectical or dipedetic), hemoliquorocirculatory disorders, edema and swelling of the brain, as well as developing processes of cleansing from decay products of brain tissue and spilled blood.

2) Concussion. Diffuse ultrastructural changes in synapses, neurons, glia.

3) Diffuse axonal injury. Primary ruptures of axons.

4) Compression of the brain. Microcirculation disorders, edematous and ischemic changes in neurons.

Anti-impact contusions were also distinguished, which arose in the zone directly opposite the point of impact. They were most often found at the poles of the frontal and temporal lobes. Their morphology is areas of merging small- and large-point hemorrhages, capturing several convolutions, as well as erosive damage to the soft meninges.

Brain contusions resulting from fractures were located directly in the fracture area. They might not coincide with the point of application of force, but were always located in the area of the fracture line. Their morphology is a "chain" of merging small- and large-point hemorrhages, sometimes small areas of crushing of the brain substance with damage to the soft meninges.

The morphological characteristics of the identified changes in traumatic brain injury were manifested mainly in the form of epi-, subdural and subarachnoid hemorrhages.

Epidural hematomas during the day in the form of liquid blood with clots; on the 2nd-3rd day - a wet, shiny blood clot; on the 4th-5th day dark red with a brownish tint, compacted to the touch; by the end of the 1st week of a pronounced brown color, compacted to the touch; on the 2nd week dark brown, crumbles when pressed; by the end of the 2nd-3rd week, a more pronounced formation of a connective tissue capsule is formed around; later, cicatricial thickening of the dura mater with growths into the bones of the skull.

Subdural hemorrhages within 24 hours in the form of liquid blood with unformed small clots; by the end of 2-3 days, the hematoma is in the form of a formed dark red clot; by the end of the 1st week, the blood clot is brown; by the end of the 2nd week, it grows relatively firmly together with the dura mater; after 2-3 weeks, a capsule begins to form around the hematoma with its gradual thickening; by the end of the month, the thickness of the outer leaflet of the capsule can be equal to the thickness of the dura mater; after several months, it acquires a brownish-gray color, over time they organize and slowly dissolve, even several years after the injury in the form of layers on the dura mater.

Subarachnoid hemorrhages usually in the form of liquid blood gradually fill the grooves, partially mixing with the cerebrospinal fluid and reaching the cisterns of the base of the brain; blood is resorbed within a week. If blood enters the subarachnoid space, aseptic meningitis may develop. Diffuse subarachnoid hemorrhages spread over the entire surface of both hemispheres. In areas of the cortex subject to subarachnoid hemorrhage, small focal hemorrhages and blood stasis in microvessels can be detected. With massive or repeated subarachnoid hemorrhages, absorption of cerebrospinal fluid is impaired and hydrocephalus may develop.

Conclusion. Consequently, the results of the conducted study indicate that morphologically craniocerebral trauma manifested itself in the form of epi-, subdural and subarachnoid hemorrhages. By the nature of their changes, in particular the state of hemorrhage, the presence of a clot, color, organization or resorption, density and a number of other signs, it is possible to definitely establish the time of injury.

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