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Research Article

FORENSIC MEDICAL ASSESSMENT OF THE PRESCRIPTION OF SOFT TISSUE INJURIES IN THE PRACTICE OF EXAMINATION

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ABSTRACT

Blunt mechanical trauma is one of the main medical and social problems of our time. The beginning of the third millennium is characterized by the intensification of people's lives, the need for rapid movement, the development of transport and technology. This inevitably has its downside in the form of an increase in the risk of injuries in transport and in everyday life, which is greatly facilitated by widespread urbanization. Therefore, the death rate from blunt mechanical trauma remains one of the leading places in the overall structure of the mortality of the world's population [1].

KEYWORDS

Blunt mechanical trauma, discussion.

INTRODUCTION

For forensic medicine, this means the increasing importance of studying the lifetime and age of injuries, including soft tissues, which are the first to encounter traumatic agents.

It is their injuries that carry information about the time of injury. Thus, blunt mechanical trauma is a significant socio-economic problem, the development of which requires forensic experts to apply efforts in this matter. [3,].

The early period after the injury, when the survival of cells and tissues is preserved, is still the most difficult and most subjective in the expert interpretation of the prescription of injuries.

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It is quite well studied by the biochemical method [4], but in the daily expert work, the biochemical method has not found wide application, remaining purely scientific.

The purpose of the study. Development of an algorithm for modern morphometric assessment of the prescription of soft tissue injuries in the practice of forensic medical examination.

Material and methods of research. To study the prevalence of soft tissue injuries in blunt mechanical trauma, we used archival data, clinical and sectional materials collected on the basis of the thanatology departments of the Tashkent City branch of the Republican Scientific and Practical Center for Forensic Medical Examination. For morphometric and histological studies, pieces of soft tissues of the limbs and trunk (skin, subcutaneous tissue, subcutaneous muscles) of people who died from traumatic and non-traumatic causes of death were collected.

The study was based on data from the analysis of 53 cases of soft tissue injury with a blunt object at the age of 18 to 37 years. The greatest number of soft tissue injuries was registered among men (57,8%).

The largest number of injuries are domestic-27 (50,9%) cases, the second most common in street injuries - 11 (20,7 %), of which 3,7% are transport injuries, as well as school and sports injuries (13,8% and 10,9%, respectively).

Overall, it was found that men were 2,2 times more likely to be injured than women.

The structure of injuries of men and women in general did not differ, the leading injury was hard blunt objects (household), and in men it was 1,5 times more common than in women. The second place in the structure of injuries was occupied by street injuries, and their frequency in men was 1,9 times higher than in women.

The data analysis was carried out taking into account the criteria of the severity of injuries in accordance with the articles of the Criminal Code of the Republic of Uzbekistan (Articles 104, 105 and 109) and the Order of the Ministry of Health of the Republic of Uzbekistan No. 153 of June 01, 2012.

The results of the study and their discussion.

As a result of histological examination of injured soft tissues in dynamics, we found that it makes sense to adhere to the division of tissues into two zones - the zone of destruction and the zone of reactive changes.

At death at the accident sites, we saw areas of tissue destruction in the destruction zone, while the destruction zones were heterogeneous - destroyed tissues in the form of tissue detritus and fragments, fragments of muscle and connective tissue fibers, adipose tissue cells, fragments of the epidermis were located among islands of unchanged soft tissues. Often, the destruction zones were clearly localized - abrasions, bruises - in these cases, violations of the integrity of the epidermis, its marginal flattening and compaction (abrasions), hemorrhages in the tissues that erased the pattern of the structure of the tissues were clearly visible.

Hemorrhages in the areas of destruction were not always present — in 23,2% of cases they were absent. In the existing hemorrhages, red blood cells were not always changed (leaching, hemolysis), there were often foreign impurities - soil particles, clothing fibers, unidentified particles. Sometimes there was a weak - from individual cells-admixture of white blood cells. The destruction zones occupied almost the entire area in the sections, up to 77,8%, but islands of preserved

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soft tissues were clearly visible around the destruction zones and their thickness.

We did not find any pronounced changes in the color of the dermis, the fibers of the striated muscles-metachromasia-although there were still weakly pronounced changes in the color of the dermis. Already in this time period, we can talk about the pronounced fragmentation of striated muscle fibers and their dystrophic (degenerative) changes.

Degenerative changes, which are manifested in the disappearance of nuclei, swelling and metachromasia of fibers, are barely traced. The vessels of the tissues in this time interval are empty, sharply and unevenly expanded. In some sections, single full-blooded capillaries of the stroma of soft tissues are visible.

Sometimes in the destruction zone, the stroma of the tissues is not visible due to the destruction of the soft tissues. The cells of the fat injured tissue had different shapes, sometimes irregular, ugly.

In the zone of reactive changes, we noted the preservation of the structure of tissues - skin, subcutaneous tissue, and muscles-at the scene of death. In the skin there were overlays on the preserved epidermis - blood, soil particles, clothing fibers, structureless masses. Often, the stratum corneum of the epidermis was absent, while the remaining layers were preserved. There was no metochromasia in the dermis, but there was a slight loosening of the stroma. The skin derivatives remained unchanged.

The vessels of the stroma of the dermis, subcutaneous tissue, and muscles were empty, sharply and unevenly dilated, with the predominance of dormant, dystonic vessels and the fullness of single capillaries. When studying isolated preparations of adipose tissue and striated muscle fibers, single full-blooded capillaries of the stroma are visible in anemia and dystonia of other vessels, while it was sometimes difficult to reliably speak about the belonging of the microcirculation vessel to any channel. The cells of subcutaneous adipose tissue and adipose tissue around the destruction zone remained inactive throughout all the studies — no changes in their shape or size were noted. The stroma of adipose tissue and muscle fibers was swollen. The fragmentation of striated muscle fibers was weak, capturing individual fibers or bundles of fibers, or absent. At the same time, the phenomena of fiber swelling, cytoplasmic basophilia, weak nuclear distinctness, and transverse striation are seen in many myocytes.

After 2 hours, the destruction zone already occupied the entire section, but small islands of soft tissue were also discernible, retaining their structure. Hemorrhages in the zone of destruction became denser, the pattern of the structure of tissues was completely erased in their thickness, the degree of hemolysis of red blood cells and the number of white blood cells increased. In the areas of epidermis sedimentation, the pycnosis of the nuclei of compacted and flattened cells increased. The metachromasia of the dermis was clearly visible.

The adipose cells retained their altered forms. At this stage, the stroma of the sebaceous, sweat glands, hair follicles, and nerve nodes becomes discernible. In our material, there were only a few nerve nodes (up to 15), but the changes that occurred after two hours in them persisted over time. We believe that for a more accurate determination of changes in the nervous tissue of soft tissues, a separate study with a wide application of additional colors is necessary.

Striated muscle fibers completely lost their transverse striation, the nuclei were not visible. The vessels -

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venules, arterioles-were mostly dilated, empty. The fullness of single dilated capillaries was preserved.

In the zone of reactive changes, after 2 hours, full-blooded dilated vessels were noted, the structure of the tissues was not disturbed. At the same time, the loosening of the layers of the epidermis, edema of the dermis stroma, muscle stroma and fiber were clearly visible. Numerous dilated empty vessels of the venous and arterial channels are visible. There were no other significant changes in the reactive change zone.

After 4 hours, the destruction zone becomes more clearly visible. The number of white blood cells in hemorrhages increases, but remains moderate. Also, the degree of hemolysis of red blood cells increases, red blood cells with erased contours are visible. Fibrin filaments appear. The destroyed tissues — muscle fibers, connective tissue and adipose tissue-retain only the contours, the cellular structure is completely erased. Metachromasia of the dermis is even more pronounced in the areas of sedimentation. As before, the sebaceous, sweat glands, and hair follicles remain inert - having acquired pycnosis of the nuclei and weak basophilia of the cytoplasm in the first 2 hours, they remain so during further investigation. Preserved vessels are dilated; full-blooded venules, capillaries, arterioles, and larger venous, arterial vessels.

Conclusion. Assessment of the age of soft tissue damage by morphometric method in the first day after the injury shows a reliable dynamics of the increase in capillary anemia, increase in capillary lumen, increase in the size of adipose tissue cells, which can serve as new criteria for histological determination of the age of damage.

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