ОПРЕДЕЛЕНИЕ ДАВНОСТИ ПЕРЕЛОМОВ РЕБЕР НА ОСНОВЕ МОРФОЛОГИЧЕСКИХ ПРИЗНАКИ В ПРАКТИКЕ СУДЕБНОЙ МЕДИЦИНЫ

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ОПРЕДЕЛЕНИЕ ДАВНОСТИ ПЕРЕЛОМОВ РЕБЕР НА ОСНОВЕ МОРФОЛОГИЧЕСКИХ ПРИЗНАКИ В ПРАКТИКЕ СУДЕБНОЙ МЕДИЦИНЫ. ЖКМП.-2024.-Т.3.-№3.-С

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Аннотация: Одним из актуальных вопросов судебно-медицинской экспертизы является определение механических повреждений и длительности их передачи, определение продолжительности этих повреждений. Большинство исследований в этом направлении посвящено изучению реактивных изменений мягких тканей и внутренних органов. Лишь несколько исследований были посвящены оценке продолжительности переломов костей с использованием рентгенологических, гистологических и биофизических методов. Также было установлено, что фрактографический метод для изучения динамических следов скольжения на поверхности, излома фрагментов ребер, морфологических изменений на поверхности перелома при активном дыхании будет эффективен при определении сроков доставки переломов ребер.
Ключевые слова: *ребра, перелом, морфология, судебно-медицинская экспертиза.*

SUD TIBBIYOTI AMALIYOTIDA QOVURG‘ALAR SINISHLARINI MORFOLOGIK XUSUSIYATLARI ASOSIDA YETKAZILISH MUDDATLARINI ANIQLASHI

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Annotatsiya: Sud tibbiyoti ekspertizasining dolzarb masalalaridan biri bu mexanik shikastlanishlar va ularning yetkazilish muddatlarini aniqlash, ushbu jarohatlarni davomiyligini belgilashdir. Ushbu yo‘nalishdagi aksariyat tadqiqotlar yumshoq to‘qimalar va ichki organlardagi reaktiv o‘zgarishlarni o‘rganishga bag‘ishlangan. Radiologik, gistologik va biofizik usullardan foydalangan holda suyak sinishining muddati va ularning davomiyligini baholashga faqat bir nechta tadqiqotlar bag‘ishlangandir. Qovurg‘alar sinishlarini yetkazilish muddatlarini aniqlashda sirtdagi dinamik siljish izlarini, qovurg‘a bo‘laklarining sinishlarini, faol nafas olish paytida sinish yuzasidagi morfologik o‘zgarishlarni o‘rganish uchun fraktografik usul yaxshi samara berishi ham baholangan.
Kalit so‘zlar: *qovurg‘alar, sinish, morfologiya, sud tibbiy ekspertiza.*

DETERMINATION OF THE PRESCRIPTION OF RIB FRACTURES BASED ON MORPHOLOGICAL SIGNS IN THE PRACTICE OF FORENSIC MEDICINE

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Annotation: One of the pressing issues of Forensic Medicine examination is the determination of mechanical injuries and their duration of transmission, the determination of the duration of these injuries. Most research in this direction is devoted to studying reactive changes in soft tissues and internal organs. Only a few studies have been devoted to assessing the duration and duration of bone fractures using radiological, histological, and biophysical methods. It has also been assessed that the fractographic method to study Dynamic slip marks on the surface, fracture of the rib fragments, and morphological changes in the fracture surface during active breathing will work well in determining the delivery times of rib fractures.

Keywords: *ribs, fracture, morphology, forensic examination.*

Introduction: One of the urgent problems of forensic medicine is determining the duration of mechanical injuries and the duration of these injuries. Most of the research in this direction is devoted to studying reactive changes in soft tissues and internal organs [1-5]. Several studies have been devoted to the assessment of the duration and duration of bone fracture transmission using radiological, histological, electron microscopic, and biophysical methods [6-9]. Most of the listed works are descriptions of the results of preliminary studies and are not suitable for practical use. The fractographic method was used to study the traces of dynamic displacement of the ribs from the outside in the assessment of their duration of injuries, the fracture of the rib fragments, and morphological changes on the fracture surface during active breathing were also evaluated [10-11]. Thus, the issue of determining the duration of fractures has not been sufficiently studied in forensic practice, and its solution has always been evaluated by forensic medical experts by analyzing the pathomorphological changes that occur based on the individual characteristics of the organism [12,13].

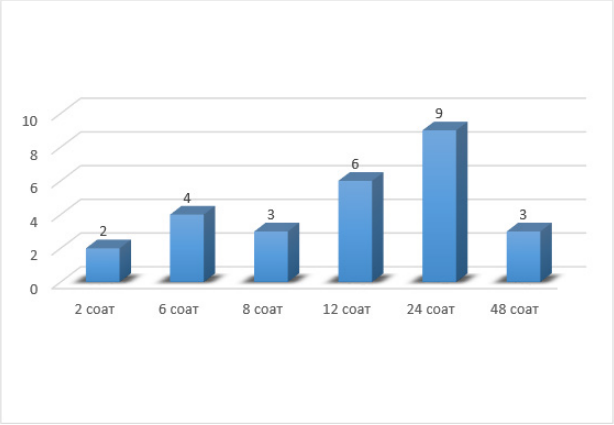
The aim: In the practice of forensic medicine, it is based on the assessment of the duration of delivery of rib fractures caused by impassable objects based on their morphological characteristics. Research object: To achieve the goal set before us, 27 (16 male and 11 female cadavers) corpses that died as a result of rib fractures due to various degrees of penetrating body and their expert conclusions were studied. Their average age is 37.2±3.8 years.

Research: The results of morphological, forensic-histological, and forensic examination of 27 (16 male and 11 female corpses) corpses that died as a result of rib fractures caused by various degrees of the penetrating body are considered.

Methods: morphological, histological forensic criminological, and statistical methods were used.

Results: The structure of bone tissue and its mechanical properties, in most cases, both the material itself and the structure are the most important factors that determine the behavior and destruction process under load. Synonyms of the concept of «structure» are: «internal structure», «internal construction», «internal structure», «structural features», and «a set of macrostructure and microstructure». These factors are of particular importance if the injury occurs as a result of shock (local, local, contact damage). It should be noted that, as a result of the first scientific studies, bone tissue was a hard material with a sufficiently high modulus that it broke down in a brittle manner. This process can be for various reasons. Therefore, it is often possible to find information that bone tissue is a fragile material. Mechanical properties are affected by some biological factors since bone is a living biological object that is part of the body. In this regard, a group of biological factors affecting deformation and decay was identified: the level of functional activity of bone tissue, the ability to «adapt» to long-term stress, its connection with other areas and systems, different conditions of the body (diseases, age, activity level) and others. In all studied cases, the results of pathomorphological examinations were also analyzed to ensure the correctness and validity of forensic diagnoses of rib fractures caused by impassable objects. The basis of this work was a prospective analysis of 27 corpses that died as a result of rib fractures under the influence of impassable bodies and their expert conclusions, selected from the archival materials of the thanatology department of the Fergana Regional Branch of the Republican Forensic Medical Expertise Scientific and Practical Center in 2024 [14].

Diagram 1. Cases that do not exceed 48 hours from the time of the incident.



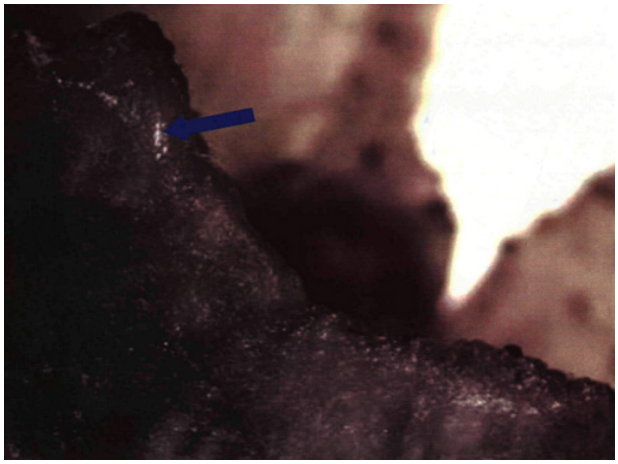
Our investigation was based on the information from the reports, the information recorded in the medical records, and the manifestation of these symptoms from the time of the injury, which includes cases that did not exceed 48 hours from the time of the incident (Diag.1).The generalized idea of bone structure is that it is a complex substance consisting of osteons and intermediate and closed plates. In the end, it consists of dense, compact lamellae, and thin cylindrical shells formed by the interconnection

of collagen fibers and hydroxylapatite crystals.

The internal structures of the bone have a directed direction. There are also many small cavities and canals in the bone tissue. All this determines the homogeneous structure of the biomaterial. In addition, its condition depends on the biological processes that constantly occur in a living organism. This important situation consists of the constant renewal of bone tissue, the effect of mineral metabolism, the hormonal background, etc. During our investigations, it was proven that any injury-causing factors cause two types of reactions in the body that are not specific to it, that is, the general stress reaction for the body and the local inflammation and subsequent regeneration processes specific to the injury. It has been proven that stress causes pathomorphological changes in the neuroendocrine system, that is, first of all, in the hypothalamus, pituitary gland, and cortical parts of the adrenal glands. Of course, here the neurovegetative reactions of the body after the injury are mainly carried out immediately after the impact of stress, it takes some time for the effect of the steroid hormones present in the body to manifest [14,15,16]. Like neuroendocrine responses, the autonomic nervous system's response to overstimulation involves three phases. In the organism, these three stages are activation, adaptation, and exhaustion, which determine its role in teratogenesis. The decrease in noradrenaline reserves in the sympathetic nerves is compensated by the release of adrenaline by the cortex of the adrenal gland until the possibilities are exhausted. Reactions of sympathoadrenal and hypothalamic-pituitary-adrenal systems are interrelated. For example, at the initial stage of the formation of emergency adaptation, corticosteroids cause an increase in the binding sites of catecholamines-vasoconstrictors [17,18,19,20,21].

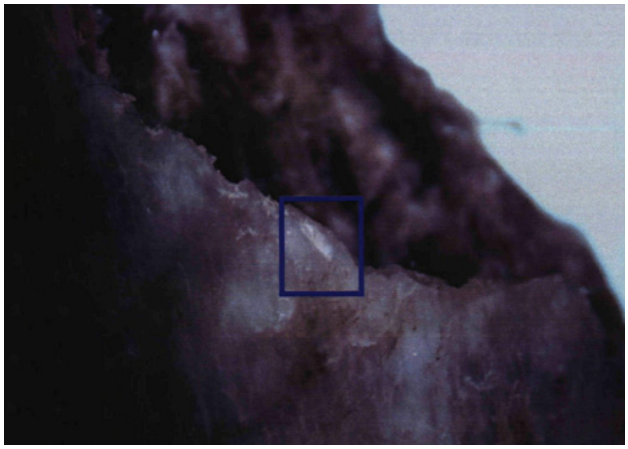
Deep grooves, known in forensic medicine practice, are the first sign of dynamic displacement of bone fragments, and these signs were observed in almost all cases from 30 minutes to 24 hours after the injury. This situation was observed in 9 of our investigations. That is, in cases where the duration of the injury is up to 1-8 hours. In most of these cases, the observation against the background of small crushed bone fragments together with friction has proven to be important for forensic practice. The observation of functional smoothing of the fracture edges formed after the injury in the period from 6 to 16 days after the injury was also justified in our investigations. In this case, on the 16th day after the injury, it has been proved once again from a practical point of view that the scars of the injury gradually disappear in the bones.

Figure 1. Cases that do not exceed 48 hours from the time of the incident.



Also, in our tests, it was confirmed that the first weakly expressed frictions (shiny coatings) appeared within 30 minutes after the formation of the wound. The duration of these pathomorphological signs can be observed up to 6-9 days (Fig.2).

Figure 2. Duration of weakly expressed frictions.



Also, in our investigations, we assessed the interdependence of gender and age and their influence on the dynamics of these injuries. According to him, in 7 out of 9 cases of fractures of the same ribs, the morphology of the fracture, that is, traces of fragmentation and friction, in 7 cases, it was found that men who were much younger in terms of age healed faster in internal examinations. When examining sections for histological examination taken from the site of rib fractures in cadavers, the following was found: the maximum fullness of arteries in 2-6 hours after the injury was found to be 65-80% in 9 observations.

It is known that such tests are mainly studied in the practice of forensic medicine to determine the duration of long-term reactions to injury. These include a large amount of blood in the cavities, vascular thrombosis, aspiration of blood, detritus, foreign bodies into the deep parts of the respiratory tract and sinus cavities, their absorption and movement through the gastrointestinal tract, damage to the regional autonomic nerve plexuses, and the presence of red blood cells. Erythrophagy and changes in the composition of some inorganic elements in regional lymph nodes are also significant. If we choose our criteria that determine the type of load and the strength of the stress state for each object. For example: tensile stress or strain is the most reliable and accurate criterion for predicting tensile fracture of brittle bodies, while shear stress at break is used to assess the failure of plastic bodies [22,23,24] The main goal of our researchers is that forensic experts always pay attention to local changes in injuries and make an accurate forensic assessment of the duration of transmission through such pathomorphological changes. Many different methods have been developed to determine the duration of injury based on local variations, so it is impossible to consider the possibilities of these methods and choose them to solve practical problems without systematizing them. In our opinion, it is appropriate to divide the methods of studying local reactions to injury into macroscopic, clinical-instrumental, biophysical, biochemical, radiological, histological, (including histochemical, immunohistochemical, and histomorphometric), and fractographic evaluations according to the basic principles and parameters [25,26,27].

Conclusion: A complex differentiated approach to the forensic diagnosis of the timing of delivery of ribs due to the impact of impassable bodies allows for the most complete systematic analysis of this type of violent death, which is the basis for wide application in improving the quality and efficiency of this type of expertise and research.

Forensic examination of fatal rib fractures should be based on a combined assessment of clinical, pathological, and morphometric data, taking into account the results of a forensic assessment of the duration of their transmission, taking into account all relevant circumstances. Only with this approach, we can answer the question of forensic assessment of the duration of injuries positively.

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