FORENSIC MEDICAL ANALYSIS OF RADIOGRAPHIC MATERIALS IN RARE CASES OF DIAPHYSEAL FRACTURES OF THE LEG BONE IN CHILDREN WHEN JUMPING IN THE BATHTUB

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ANNOTATION

Considering the significant contribution of childhood injuries to the structure of general problems related to child health, it is important to determine the exact mechanism of fractures, in particular, diaphyseal fractures of the lower leg bones, during examinations, as the specification of the mechanism of formation of bodily injuries leads, in essence, to the origins of injuries and allows for the further development of a set of preventive measures to prevent the occurrence of these situations, moreover, sometimes allows for the accurate distribution of the burden of responsibility for the incident between the defendants in the case.

Keywords: diaphyseal fractures; lower leg bones; children; mechanism of fracture occurrence.

Childhood injuries remain one of the main problems in medicine and occupy a significant share in the structure of general health-related problems in children. The main risk group is children aged 10 to 14, who account for approximately 1/3 of all childhood injuries. Childhood injuries remain a serious social problem, especially considering the consequences of significant injuries in the form of fractures. Against this backdrop, the injuries received by children in children's entertainment centers, mostly related to gross violations of the rules for operating sports and entertainment devices and equipment, when the direct "culprits" of young children become victims of their own negligence, attract particular attention. Trauma on the truss is not uncommon, which is not always limited to superficial injuries in the form of hemorrhages, scars, etc. Fractures obtained during batut operation are mainly localized in the metaepiphyseal zones of the long tubular bones of the upper and lower extremities, in the ankle region of the lower leg bones. However, fractures of unusual localization and morphology are encountered, which are a source of expert errors in determining the mechanism of injury, especially in cases where the examinee and their legal representative describe the circumstances of injury that do not correspond to the case materials, as well as the nature of the injury received. In this case, the age-related

characteristics of the child's bone tissue, which contains more organic substances than inorganic ones, are of great importance, which ensures the characteristic features of diaphyseal fractures in children.

Case description: The forensic medical examination was conducted by order of the investigator of the investigative committee 2 months after the incident.

Circumstances of the case: A statement was received from the legal representative - the mother of young K. - requesting "to bring to justice the guilty persons for providing services that do not meet safety requirements, as a result of which her young daughter was injured as a result of falling from a trampoline in the trampoline center" (accurate quote from the resolution).

For examination, the following were presented: the medical record of the inpatient patient, radiographs, and the infant K., 11 years old. During a forensic medical examination, young K. and her mother stated that the victim's right leg bones were broken when she jumped from the trampoline onto the mat and hit her right leg against the edge of a solid rectangular "postament" placed next to the trampoline. During the forensic medical examination of the subject, no bodily injuries or signs of their healing related to the above-described events were found.

The investigator additionally provided a video recording from the surveillance camera installed to the left and above the location of the trunk section where the incident occurred, with the opposite part of the aforementioned "post" being outside the camera's perimeter. During the slow-motion and frame-by-frame viewing of the video recording, the following was established: young K. jumps on the trampoline, at this moment another girl jumps off the "post" with a height and physique approximately corresponding to the subject under examination. The moment of K. "landing" on the surface of the trampoline (with the supporting right leg) coincides with the "landing" on the trampoline of the second girl, after which K. jumps onto the mat beyond the trampoline with his right leg slightly compressed towards the "postament" falling from the camera field of view, the fact of which cannot be established based on the video recording, and then the child falls onto the mat on his hips.

Discussion: During the examination of the radiographs of the right lower leg by a forensic medical expert, it was established that young K. had the following bodily injuries at the time of her medical appeal: a closed screw-fragmented fracture of the middle third of the tibial diaphysis. Bone with displacement of fragments, closed oblique fracture of the middle third of the tibial diaphysis with displacement, closed subperiosteal fracture ("green branch" type) of the upper third of the tibial diaphysis without displacement (subcapital fracture).

Taking into account the above and taking into account the age-specific characteristics of the child's bone tissue (higher water and organic matter content, lower mineral matter content, which ensures greater flexibility, elasticity, and lower fragility compared to adult bones), as well as the morphological features of fractures indicating their structural nature (indirect mechanism of injury): combination of rotation and bending with simultaneous forced longitudinal loading, it can be concluded that these fractures occurred simultaneously, as a result of K. "landing" on the hard, tightly stretched surface of the trampoline on the supporting right leg. Thus, despite the incomplete informativeness of the presented video recording due to the limited camera perimeter, it is possible to completely rule out the possibility of the formation of these fractures as a result of impact on the "solid pedestal," as indicated initially by the victim and her mother.

Conclusion The presented case from expert practice demonstrates the importance of thoroughly studying radiographs not only to establish the fact of fractures as such but also their morphological features, which allows the expert at this stage of the examination to determine the nature of fractures (local or structural). However, a complete restoration of the circumstances of the incident is possible only with a comprehensive analysis of both the medical documents and the case materials, while it is important to consider the age and constitutional characteristics of the examinee.

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