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PREVALENCE, TYPES, MECHANISMS AND NATURE OF ORBIT INJURIES

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ABSTRACT

The article reflects a comprehensive analysis of aspects of forensic-medical expertise of orbital trauma. The issues related to the peculiarities of forensic-medical assessment of isolated and combined orbital trauma at the present stage are presented. The difficulties of expertise in these conditions are considered, which are determined, on the one hand, by the interdisciplinary nature of this pathology, and on the other hand, by the imperfection of the legal framework. The necessity of reviewing and reforming the existing legislative basis of forensic-medical expertise is substantiated.

Key words: orbital trauma, forensic-medical expertise, degree of injury severity.

INTRODUCTION

Forensic medical examination of orbit injuries is currently an urgent interdisciplinary issue, which is devoted only to a few works of specialists in the field of forensic medicine [1, 2, 3, 5]. Unfortunately, a clear algorithm for the actions of a forensic expert in various types of orbital trauma has not yet been developed. At the same time, there are several problems related to the classification, clinical and instrumental diagnosis of orbit and its contents injuries. In aggregate, all these complexities lead to subjectivity, and sometimes errors in assessing such cases [11, 15].

The epidemiology of orbit injuries is closely related to the epidemiology of facial and head injuries. From the perspective of the topography of the facial skull, the orbit belongs to the so-called “middle zone of the face” [12, 13, 14]. In the overall structure of facial bone injuries, orbit injuries account for about 15-40%, with their number showing a tendency to increase, predominantly affecting individuals aged 20 to 50 years [8, 9]. Among facial injuries, the proportion of injuries to the “middle zone” bones is, according to various authors, up to 48% of cases. Due to the close interconnection of the orbit with other sections of the skull, these injuries typically have a multiple and combined nature [1, 4, 6, 7]. Thus, orbit trauma occupies a significant place in the structure of skull bone injuries.

A whole complex of social factors – the increase in the frequency of technological disasters, the rise in the number of road traffic accidents, as well as the emergence of high-precision diagnostic and therapeutic technologies – all of this, on the one hand, gives rise to a multitude of new complexities, and on the other hand, provides new opportunities for conducting expert examinations of orbital trauma in the modern stage [7, 9, 10].

The existing contradiction between the increasing practical need for expert studies to determine the severity of bodily injuries in orbital trauma and the absence of comprehensive scientific research on this problem determined the relevance of this study.

Research Objective: To conduct a retrospective analysis of forensic medical examination reports on living individuals with traumatic orbital injuries to identify the prevalence, types, mechanisms and nature of injuries.

Materials and Methods: The research focused on 611 archived forensic medical examination reports on living individuals, of which 143 reports were selected for individuals with orbital injuries. Additionally, 41 patients with a diagnosis of orbital trauma were examined.

Statistical analysis was based on descriptive statistical methods (determining mean values, standard deviation) and was performed using the program Statistics 5.0 for Windows.

Results and Discussion: During the study of forensic medical examination reports, it was found that the age of the victims at the time of injury ranged from 9 to 76 years (average 34.1±1.2 years); there were 128 adults and 15 children (under 18 years old); 105 were male, and 38 were female (ratio 2.7:1). According to the forensic medical examination data in the selected group (n=143), severe health damage was qualified in 69 individuals (48.3%), moderate health damage in 62 individuals (43.4%), and mild health damage in 12 individuals (8.4%).

The analysis revealed that forensic medical examination reports include three variants of orbital injuries: isolated, in combination with cranial-brain injury (CBI), and in combination with injuries to other body areas.

In cases of combined orbital trauma, in 6.3% (9 individuals), life-threatening conditions such as shock of III-IV degree, hemothorax, and polytrauma (severe accompanying traumatic injuries) were observed in addition to CBI.

The combination of CBI and orbital trauma without other injuries was observed in 118 victims (82.5%), while isolated orbital trauma was present in 16 individuals (11.2%).

Orbital trauma in the conclusions of forensic medical experts was mainly represented by fractures of the bony walls (90.9%). Only a small number of cases were accompanied by contusion of the soft tissues of the orbit. In half of the victims (53.8%), the condition of the eyeball itself was assessed as normal or with contusion of mild severity.

The distribution of the severity of bodily injuries and forensic medical qualifying signs determining it is presented as “bodily injury dangerous to human life” established in 62 cases (43.4%), indicating severe bodily injury.

In almost half of the cases (n=68, 47.6%), forensic medical experts used the qualifying criterion “duration of health disorder” to determine the severity of bodily injuries. However, this qualifying criterion has the least reliable objectivity, primarily because it does not reflect the immediate severity of the inflicted injuries.

In 51 cases, health damage of moderate severity was determined by qualifying signs: “significant persistent loss of general work capacity” (only 6 cases), and in the remaining 45 cases, the criterion “duration of health disorder” was applied. Thirteen victims sustained fractures of the upper wall of the eye socket, the orbital plate of the ethmoid bone, which qualify as severe bodily injuries dangerous to human life.

Conclusions: Thus, orbital injuries are combined with cranial-brain injuries of varying severity in 81.8% of cases, and with life-threatening conditions in 7% of cases. It was found that in 49.7% of cases, orbital trauma is an injury that determines the severity of harm to health when combined with mild concussion or contusion of the brain (38.5%) or in cases of isolated trauma (11.2%). In forensic medical assessment, when considering orbital trauma as the dominant injury, injuries of moderate severity were established in 71.8% of cases, light severity in 15.5%, and only 12.7% were classified as severe. In this context, the qualifying criterion of the duration of health disorder (78.9%) predominates over the criterion of persistent loss of general work capacity (16.9%).

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