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## Damage To Eyes, Orbit And Visual Nerve , Combined With Cranial Injury In Emergency Medicine

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### ABSTRACT

The features of the clinical course, symptoms and the difficulty of diagnosing traumatic injuries of the eye, orbit and optic nerve are described. A total of 952 patients with concomitant craniocerebral injuries and injuries to the eye, orbit, optic nerve were studied in 2018. The possibilities of computer tomography in the diagnosis of traumatic injuries of the visual tract combined with traumatic brain injury and differential diagnosis of intracranial injuries of the visual tract before the hospital and hospital stages were studied. In the structure of craniocerebral trauma, craniofacial accounted for 187 (19.6%), of which 118 (6%) eye injuries, 20 (10.6%) orbit injuries, 4 (2.1%) optic nerve injuries, 19 (10 %) of patients were diagnosed with a fracture of the walls of the orbit. In 5 (2.6%) patients, an isolated fracture of the lower orbital wall was revealed. Total: 158 men (84.4%), 29 women (15.5%). The patients underwent examination, including examination by a multidisciplinary team (neurosurgeon, maxillofacial surgeon, ENT and ophthalmologist). Anamnesis was studied in all patients, a comprehensive ophthalmological examination was performed: visometry (with optimal correction), refractometry, biomicroscopy, ophthalmoscopy and neuro-ophthalmological examination. All patients underwent radiography of the orbits and skull in frontal and lateral projections, CT, MRI of the brain and orbits. To obtain additional information, 24 (12.8%) patients underwent a two-dimensional ultrasound examination - ultrasound - B SCAN of the eyeball, extraocular muscles and retrobulbar space. Timely topical diagnostics and qualified reconstructive surgeries performed in the early period of craniofacial trauma allows achieving regression of oculomotor disorders in 86.6%, prevents severe consequences and preserves the patient's vision.

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## KEYWORDS

Concomitant craniocerebral trauma, cranio-orbital lesions, computed tomography, orbital contusion, eyeball contusion

## INTRODUCTION

According to the literature, injury of the eye, orbit and optic nerve among all injuries of the facial skeleton with the involvement of the organ of vision and its auxiliary organs accounts for 64% of 9 days. According to E.S. Liebman, the consequences of eye injuries rank first in terms of primary disability [10]. Damage to the visual pathway in traumatic brain injury occurs in 0.5-5% of cases [1,20,23]. In acute combined orbital-facial trauma, damage to the optic nerve occurs in 11% of cases, as a rule, with fractures of the upper wall of the orbit and the optic nerve canal [11, 13]. About 85% of orbital injuries with fractures of the bony walls require inpatient treatment [11]. Injuries to the eye, orbit and optic nerve, especially as a result of road traffic accidents, are rarely isolated. As a rule, they are combined with injuries to the bones of the facial and cerebral skull, where one type of injury can dominate the other, in this regard, orbital injury affects the professional activities of doctors of at least five specialties - ophthalmologists, maxillofacial surgeons, neurosurgeons, otolaryngologists and radiologists. [1, 12, 13].

In addition, the social significance of orbital injuries is determined by the high visual disability of people of working age [1, 2], often these injuries lead to disfigurement of the face, which negatively affects the psyche of the victims [2].

## PURPOSE OF WORK

Studying the diagnosis of traumatic injuries of the optic nerve, eye, orbit, combined with craniocerebral trauma and differential diagnosis of intracranial damage to the optic pathway before hospital and hospital stages.

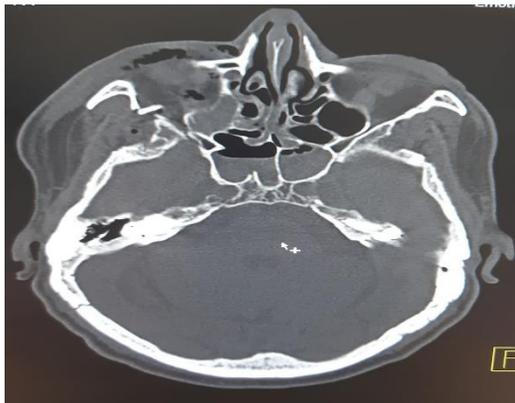
## MATERIALS AND METHODS

From 01.01.2018 to 31.12.2018, 952 patients with TBI were hospitalized in the emergency neurosurgery department of F.F.Ts.E.M.P, of whom 114 were diagnosed with skull fractures. There were 580 men (60.9%) and 372 women (39%). The share of KOP was 187 (19.6%) observations. There were 158 men (84.4%), women - 29 (15.5%). The age of the patients is from 1 to 83 years. The main causes of injuries were: criminal injury - 248 (26%), road traffic injuries - 219 (23%), industrial - 4 (0.4%), household - 48 (5%).

The patients underwent examination, including examination by a multidisciplinary team (neurosurgeon, maxillofacial surgeon and ophthalmologist), neuroophthalmological examination, CT, MRI of the brain and orbits, ultrasound of the eyeball and retrobulbar tissue. The tasks of the joint examination included determination of the TBI walls, the degree of damage orbits and their soft tissues (optic nerve, eye muscles, nerves, blood vessels), eyeball, paranasal sinuses. The scope of neuro-ophthalmological examination varied depending on the severity of the patient's condition. Patients with clear consciousness were assessed visual acuity, performed perimetry, ophthalmoscopy. Patients with

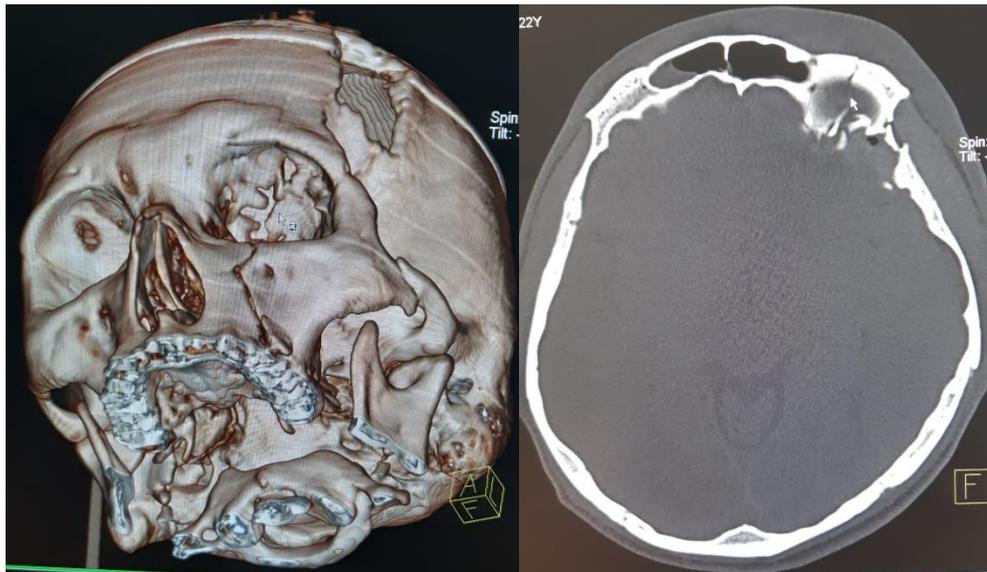
depression of consciousness to stupor and coma underwent only ophthalmoscopy. In 118 (63%) cases, such injuries are combined with various eye injuries, often 6 (5%) severe, of which 2 (1.6%) are due to contusion ruptures of the sclera. The only symptom specific for a fracture of the bottom of the orbit, which can be detected when examining the eyeball, was the dilation of the pupil to 5-8 mm. The pupil does not respond to light, but narrows with instillations of pilocarpine, which makes it possible to differentiate this pathology with contusional mydriasis. The undoubted advantages of CT include clear visualization of small and combined (several walls) fractures, bone fragments (including in the presence of

ferromagnetic foreign bodies in the orbit), as well as small time and financial costs. In addition, with the help of CT, it is possible to diagnose such complications of trauma as retrobulbar or subperiosteal hematoma, hemorrhage into the intrathecal spaces of the optic nerve, the thickness of the inferior rectus and inferior oblique muscles; out of 4 patients, orbital trauma was combined with severe contusion of the eyeball; diagnosed with subconjunctival rupture of the sclera, subluxation of the lens of the 1st degree 2, multiplication of the eye 2.



Patient S. B. Born in 1975, car accident. D-S: Fracture of the lateral, inferior, medial wall of the right orbit, the anterior and lateral wall of

the right maxillary sinus, the arch of the right zygomatic bone, the ethmoid right bone from mixing to / o. Contusion of the right paraorbital tissue.



Patient A.Sh. 1997 year of birth, car accident. D-S: Trepanation defect of the frontal-parietal bone on the left with dimensions 47x24, with the continuation of the fracture line from the defect on all walls of the left orbit, the large wing of the main bone on the right, all walls of the maxillary sinus on the left.

## RESULTS

All patients received complex conservative therapy, including dihydration, antibacterial, nootropic, neuroprotective, antioxidant, corticosteroid, hemolytic, and microcirculation-improving drugs. Indications for reconstructive surgery were for cranio-orbital injuries: violation of the ratio and deformation of the bone structures of the frontal-orbital region, compression of the eyeball or optic nerve by displaced bone fragments or foreign bodies, infringement of the soft tissues of the orbit in the fracture line, change in the position of the eyeball in the orbit, oculomotor disturbance, the

appearance of diplopia in a patient. Reconstructive operations were performed on 90 (9.4%) patients, out of 7 operations in patients with COC in the acute period of TBI in the first 24 hours from the moment of injury. Positive dynamics against the background of conservative therapy were obtained within 3-7 days: subcutaneous and subconjunctival hemorrhage, restoration of the mobility of the eyeball, disappearance of diplopia. The performed operations allowed to achieve regression of neuro-ophthalmological symptoms and obtained a satisfactory cosmetic effect - in 90%. Differentiated treatment of COP in the acute period made it possible to achieve complete restoration of visual functions in 64.1% of cases, partial - in 33.1%; regression of oculomotor disorders - in 86.6%, eyeball dystopia - in 82.5%, diplopia - in 86.5%. Ophthalmic symptoms in combined damage to the brain, orbit and its contents are characterized by pronounced polymorphism, which is determined by simultaneous damage

to the visual analyzer at various levels: local disorders (damage to the eyeball and optic nerve, extraocular muscles, edema of the soft tissues of the orbit, retrobulbar accumulation of blood or air), defeat of the III, IV, VI cranial nerves. Localization and severity of deformities, retrobulbar hemorrhages or emphysema, dislocation of the optic nerve, violation of its integrity in trauma determine the clinic and the prognosis of the process.

As a result of our reconstructive operations, by the time of discharge, the position of the eye was completely restored in 82.5% of cases, oculomotor disorders regressed in 86.6%, diplopia - in 86.5%.

These patients no longer need re-hospitalization for defect plastics and deformity reconstruction, which makes it possible to shorten the period of rehabilitation and restoration of working capacity.

## CONCLUSIONS

The modern approach to the treatment of combined craniofacial injuries involves early medical and surgical intervention within the first 1-24 hours after injury. Of the advantages of early surgical treatment, it should be noted that the discharge is easier to perform; mobilization and reposition of bone fragments. Reconstructive surgery in the acute period of trauma allows us to obtain better functional outcomes, this is confirmed, among other things, by our research. A multidisciplinary approach in the choice of treatment tactics for this category of victims, the use of modern diagnostic methods, the early terms of reconstructive operations allow to obtain good functional and cosmetic results.

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