



Some Aspects of quality of Rendering of Specialized Help to Patients with Combined Craniocerebral Trauma in Multifield Hospital

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ABSTRACT

The treatment of patients with combined craniocerebral trauma (CCT) is associated with clinical difficulties, because its symptoms are very different from other combined trauma. Nowadays the standards in treatment of such patients are not developed fully. Earlier, in 1970-80 years both domestic and foreign researchers have proposed the different scales and schemes for the estimation of such injuries. The State Hospital No 1 named by Pirogov N.I. in Moscow is considered as a multiple trauma centre with powerful diagnostic and clinical base. The article deals with the analysis of disease histories of 400 patients with combined craniocerebral trauma which were treated in this hospital for last five years. The most of the patients was brought to the hospital for the first days after trauma. The quality of pre-hospital and clinical aid was assessed; the mistakes of Reception Department were analyzed. Based on the results of analysis the system of complex inspection of patients with high-energy trauma was embedded in the State Hospital No 1.

The tactics of treatment of long bone fractures was performed depending on the severity of head injury. The computer tomography (CT) with the so-called program «combined injury» was embedded. It means the complex approach: patients, who received high-energy and heavy criminal injury, were examined by CT of the brain, chest and pelvis at the same time. It revealed that 13.7% of patients had fractures of the ribs, 8.3% of cases - fractures of the pelvis, 22.8% of cases - signs of brain injury. For the last 10 years the clinic actively applies the principle of one-stage surgical treatment by the participation of multiple surgical teams. Preliminary results of this study let us to conclude that using of this modern approach and sufficient technical equipment allow considering the head injury as not a contraindication to the active choice of tactics of treatment of fractures of long tubular bones.

The key words: emergency medical aid combined craniocerebral trauma, quality of medical help.

One of the key points of modern traumatology is the problem of treatment of combined injuries.



It has been noted that in the age period between 20 to 60 years, the mortality rate from injuries is twice than the numbers of mortality cases after cardiovascular diseases and cancer [6]. The most common type of combined injuries is the combined craniocerebral trauma (CCT), which is caused not only by the mechanical destruction of the skull and brain, but also others parts of human body. It is about 80-85% of all combined injuries and it is about 18.3% to 68.5% of the mortality [3].

One of the priorities in the concept of development of health system of the Russian Federation to 2020 is to maintain and strengthen public health and improving the quality of medical care [1]. The treatment of patients with CCT is associated not only with certain clinical difficulties, but also with significant material costs [5]. That's why the main aim faced by doctors in the treatment of this group of patients is the assessment of the damage that allows predicting the nature of pathological changes, to plan and develop an optimal strategy of rendering qualified medical aid to such patients.

Currently, the standardization of treatment of patients with CCT is not sufficiently developed. As it was noted by many researchers, in order to use any standards in treatment, first of all, it is necessary to elaborate common terminology and classification correctness. The state hospital No 1 of Moscow, according to the systematization of staff composition and its work with patients, proposed by V.V.Zhedrenok and E.K.Gumanenko in 2008, is a trauma centre of the first level, i.e. represents a multi-profile hospital with powerful diagnostic and clinical base. The teams on duty consist of specialists of different profile. The hospital is provided by all conditions for rendering of specialized medical care in case of any damage [7].

The analysis of disease histories of 400 patients with combined craniocerebral trauma which were treated in this hospital for last five years, was done. The most of the patients was brought to the hospital for the first days after trauma. The main reason of trauma is traffic accidents (56,75%). It is necessary to underline that the type and localization of injury depend on kind of transport and the role of victim during this accident. For example, the multiple injuries outside the skull are often among pedestrians (30,3%). Katatrauma is on the second place among the reasons (35.3%), primarily due to increasing of occupational injuries in the construction of tall buildings and a failure. Not less frequent reason of CCT (21.5%) becomes criminal injuries (beating), and the so-called «alcohol trauma», i.e. injuries sustained by a person in alcoholic intoxication.

The classification of CCT is based on two principles:

1. Localization of damages outside the skull

2. The ratio of craniocerebral and outside the skull damage on their severity.

The patients were classified considering localization of outside the skull damages that puts its mark on the clinical picture and surgical tactics (Fig.1).

Except the local factors, the diagnostic characteristics, therapy and result depend on the ratio of damages on their severity. It is obliged to divide every type of CCT on four groups:

1. 7,0% - hard CCT (brain injury of nor very hard and hard degree, the compression of the brain depressed skull fractures, intracranial haematomas, hydromas) and heavy outside if skull damages (broken hip, pelvis and internal injuries).
2. 18,0% - hard CCT and non-hard outside the skull damages (closed fractures of forearm bones, feet, 1-3 ribs without damage to the lung).
3. 7,0% - non-hard CCT and hard outside of skull damages.
4. 48,0% - non-hard CCT and non-hard outside of skull damages.

The symptoms of CCT are different significantly from the features of combined injuries of other localizations. The traumatic shock of the patients with intracranial lesions is rather peculiar due to the fact that the mechanisms of brain injury and traumatic shock are different. That is the reason why this pathological process was called as the «syndrome of mutual complication» in the literature [2].

Thus, edema and swelling of the brain tissue are showing its traumatic defeat. So, when CCT central nervous system (CNS) gets like «double blow» [4].

That is why the unit system of independent assessment is needed in order to get the adequate assessment of the severity of the victim with combined injuries and methods of treatment that allows comparing the result of the treatment of such patients.

In 70-80 years of the 20th century, the different scales and schemes of the estimation of the injuries have been proposed by our and foreign researchers. The scale of gravity TS (Trauma Score), is used in this paper. This scale was proposed by the American researcher H.Champion in 1982. It allows estimating only the total condition of the patient, without taking into account the nature and location of damage. Total scores can be from 1 to 16, the estimation of patient's condition is expressed in percent. This scale is convenient in everyday practical use. It is necessary to underline that this scale reflects the state of the Central nervous system, as it includes scale Glasgow. For characteristics of patients with CCT and fractures of the long bones, it is important to give the general description of the injury, taking into account the presence or absence of the victim of traumatic shock and severity of damage to the Central nervous system.

The estimation of the quality of prehospital and hospital care was done. The assessment of the quality of primary care is carried out on the analysis of 200 accompanying sheets of the emergency ambulance of the patients with CCT. The following errors were revealed: no immobilization of fractures in patients with CCT (15.0% of cases); no indication on trauma of the skeleton system with its presence in 23% of cases; underestimation of the severity of head injury in 7% of cases. These errors are related to the lack of complaints from patients because of loss of consciousness and objective examination of the patients.

Next, the analysis of the main errors in the work of the admission department was done. It showed that no inspection of traumatologist in the documents of the disease was reported in 5.5% histories, underestimation of the severity of head injury - in 7.0% histories. "Small" fractures of skeleton system were missed by a trauma specialist at survey in 9.0% of cases.

Because of these problems at the level of the admission department of the state hospital №1 the system of complex examination of patients with high-energy trauma was introduced: traffic accident, Calatrava and criminal injury. Also these patients were examined by the neurosurgeon and surgeon. This system has been used for the last five years and has significantly reduced the number of medical errors associated with under-reading damage in patients with CCT.

The introduction of computed tomography (CT) with the so-called program «combined injury» (when the patients who received high-energy and heavy criminal injury occurs CT of the brain, chest and pelvis) revealed fractures of the ribs with 13.7% of patients, with fractures of the pelvis in 8.3% of cases, having CT signs of brain injury in 22.8% of cases.

The tactics of treatment of long bone fractures was performed depending on the severity of head injury. Treatment of fractures in patients with mild head injury is not difficult. In this category of patients the stabilization of damaged fractures was made with the correction of the treatment of brain injury on the recommendations of a neurosurgeon, using standard methods of osteosynthesis, regardless of the presence of head injury.

The special approach is needed for the category of severely head-injured patients, accompanied by compression of the brain hematoma and requiring operative neurosurgical intervention. For the last 10 years the principle of one-stage surgical treatment of multiple surgical teams, with preliminary agreement tactics of operational manuals and consultation of specialists such a resuscitator, an anaesthetist, a trauma surgeon, neurosurgeon is used actively in our clinic.

The operational risks, the volume of estimate blood loss, duration of operational benefits are analyzed. If the condition of the patient on a scale TS is not less than 10 points, the volume of estimate for intracranial hemorrhage intervention does not exceed 500 ml, and there is damage of one segment, the full osteosynthesis using standard of maloinvazivnogo techniques is applied. The amount of head injury in this category of patients was as follows: a bruise of a brain moderate and severe with compression of sub - and epidural hematomas 24 patient depressed fractures of the bones of the cranial vault - 26 patients with fractures of the skull base with profuse basal liquor - 4 patients. Single-stage operations performed serially or in parallel. In severe head injury with injury of the brain in the form of significant outbreaks of injury and intracerebral hematomas methods of osteosynthesis were used that do not require large expenditures of time and are not accompanied by loss of blood is of plate osteosynthesis, the imposition of a rod devices of external fixation, regardless of the state on the scale of TS. Moreover, we consider this type of intervention as a necessary life-saving manipulation, 32 operations for patients with severe head injury.

The case of the surgical treatment of the patient X., 25 years old, who was injured in a traffic accident was analyzed in the article. Diagnosis: hard combined trauma, open head injury, hard brain contusion, depressed comminuted fracture of the parietal and temporal bones left with transition on the basis of the anterior and middle cranial fossa, epidural hematoma (Fig.2), an open fracture of both the right shin with severe soft tissue injury (IIB extent by Kaplan). The condition of the patient was estimated in 10 degree according to the scale TS, level of consciousness – 9 degree to the scale Glasgow. For the first days after trauma simultaneously surgery was performed: resection craniotomy to remove fragments and epidural hematoma by volume of 80 ml, PHO wounds leg and fixation of fragments rod apparatus. In subsequent produced bandaging wounds Shin water-soluble ointment, skin plasty with local tissues and split-flap (Fig. 3). As a result, the system was dismantled by the end of 3 weeks, the patient is on trial at the end of three weeks stabilized (Fig. 4). Made stabilizing the osteosynthesis of the tibia intramedullary pin rod with distal and proximal block (Fig. 5).

Thus, the preliminary results of the conducted researches permit to conclude that the head injury is not contraindication to the active choice of tactics of treatment of fractures of long tubular bones of the patient because of using the modern approach and sufficient technical equipment. This choice is determined by a set of parameters, which are the severity of the injury and the extent of the disorder of the vital functions of the victim, that allows not only to improve the quality of life of the patient, but also to reduce the duration of his stay in hospital.

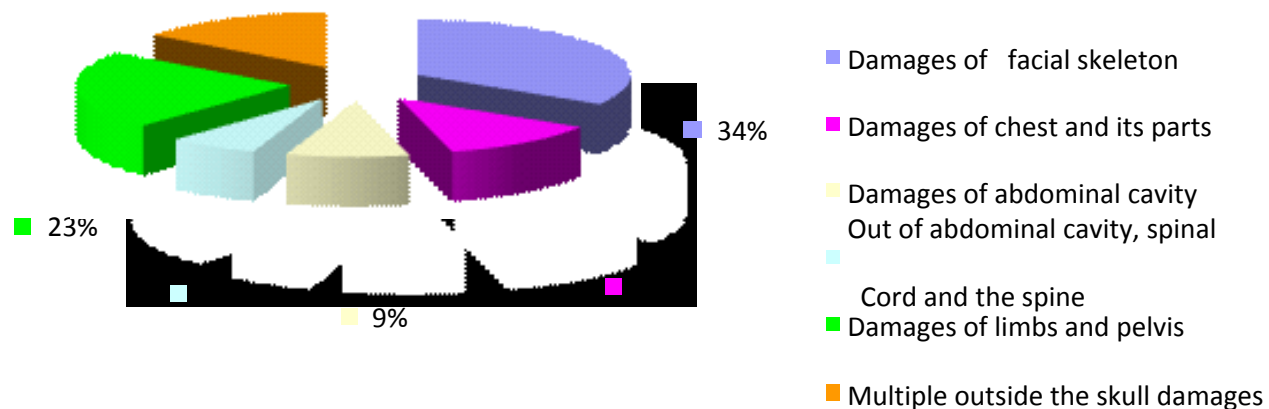


Fig.1. The distribution of patients with different places of their outside the skull' injuries.

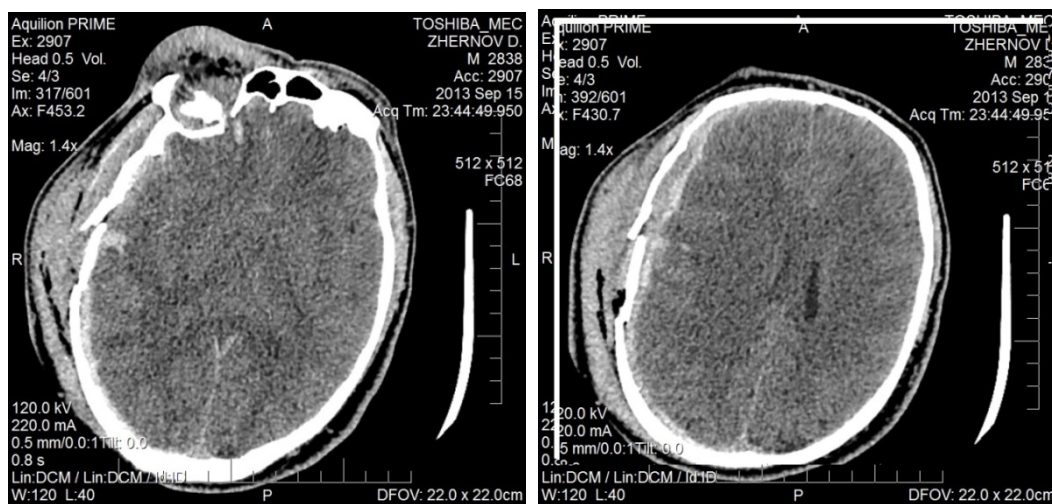


Fig. 2.

CT of the patient X, of 25 years old



a

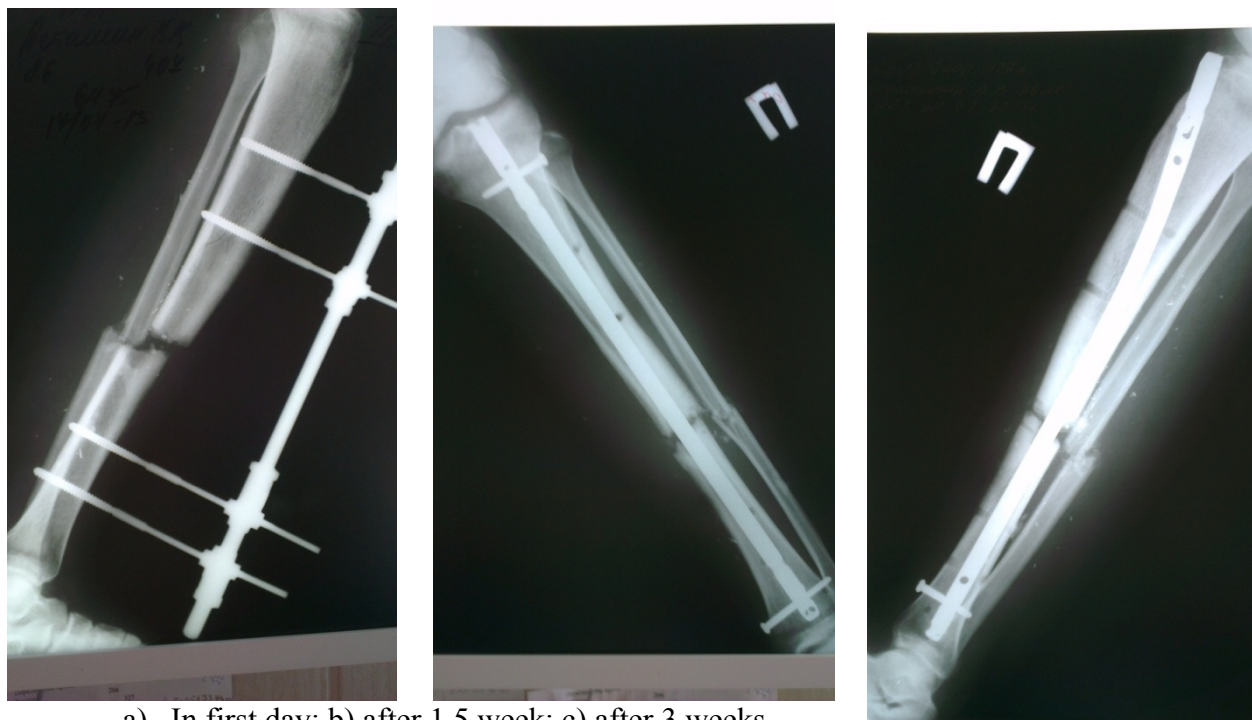


b



c

Fig. 3. The appearance of lower leg of the patient X, of the 25 years old:



a) In first day; b) after 1,5 week; c) after 3 weeks.

Fig.4. CT of the brain of the patient X, of the 25 years old, after the craniotomy for the first three days

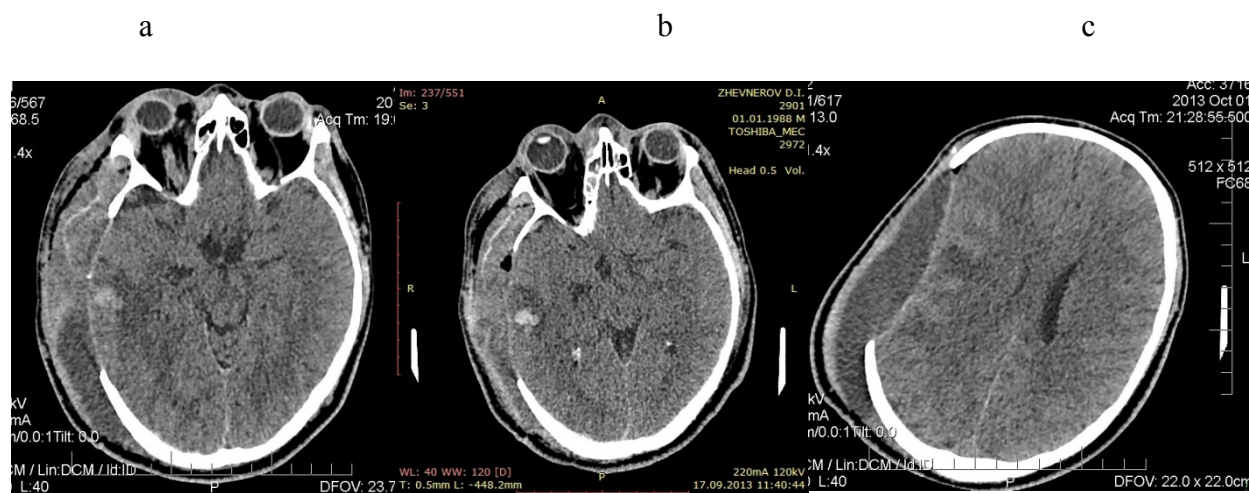


Fig 5. X-rays of the lower

bones of the patient X, of the 25 years old, after the imposition of external fixation device (a), after running stable osteosynthesis pin lock (б,в)



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