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NEUROSURGICAL METHODS OF MANAGEMENT IN TRAUMATIC BRAIN INJURY

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ABSTRACT

In this modern era trauma and traumatic injuries are being so common, despite of all the safety measures , precautions and precautory measures. Among all RTA or any traumatic injuries may include or end up having minor to major degree of neurological impact and Brain injuries are still in top most cause of death in all the present cases. So, here through this article i and my team sharing our work which we have done immensely through the cases and management of all those patients having brain injuries. Through these series of work and study performed by us we came up with this data and results to point out towards the cause and management of traumatic brain injury patients in neurological approach.

Key words: traumatic brain compression, epidural hematoma, subdural hematoma, intracerebral hematoma, trephination, craniectomy, osteoplastic craniotomy**.**

1. INTRODUCTION

In the structure of mortality from all types of injuries, about 40% are due to TBI. The problem of treating TBI is currently of great socio-economic importance. According to the World Health Organization, the incidence of TBI is increasing annually by 2%, with an increase in the incidence of more severe types of injuries. Among the victims, people of working age predominate (from 20 to 50 years), about 10% of them become disabled. The mortality rate for TBI ranges from 5 to 10%. In severe forms of TBI with the presence of intracranial hematomas, foci of brain contusion, accompanied by dislocation syndrome, mortality increases to 41-85% [1-6].

In practice, we encounter insufficient equipment of hospitals with modern diagnostic equipment (CT, MRI), and the inability to monitor ICP. In these cases, when choosing a trepanation method, one must rely on the data of a clinical neurological examination. Often, the choice of craniotomy method is influenced by subjective reasons (surgeon preferences, clinic traditions). This leads to a large number of unjustifiably performed DST in order to prevent possible bulging of the brain during its swelling in the postoperative period. As a result, the number of disabled patients increases, the percentage of reoperations and the risk of purulent-inflammatory complications increases [6-10].

2. MATERIAL AND METHODS

The data of 127 patients with isolated traumatic brain injury and operated on in the departments of neurosurgery of the Osh Interregional United Clinical Hospital and the Osh City Clinical Hospital were analyzed. Acute and subacute traumatic intracranial hematomas were more common in domestic (38 patients - 29.9%) and transport (34 patients - 26.8%) injuries ($p < 0.05$). 92 patients (72.4%) were transported to the hospital by ambulance, and the restby passing transport. Of the 127 patients admitted, 31 (24.4%) were injured while intoxicated. This was most often a domestic injury. Upon admission, all patients underwent a clinical neurological examination, CT and/or MRI examination of the brain, and after the diagnosis was established, the patients underwent surgery within the first 24 hours from the moment of injury.

3. RESULTS

To determine neurosurgical tactics and identify traumatic brain lesions, CT and MRI are an indispensable diagnostic method that provides identification of the macrostructural, functional, metabolic state of the brain, the topography of the lesion itself, swelling around it and, most importantly, they allow us to determine the relationship of the pathological focus to brain structures , to the vascular and ventricular systems, the relationship of the lesion to the subarachnoid spaces and to the middle formations of the brain, which is extremely important for solving the technique of neurosurgical operations. For removal of intracranial hematomastraumatic origin, we used three neurosurgical approaches already known in practice: KPTCH, RTC and removal of hematomas through expanded burr holes. At the same time, our task included elucidating the influence of clinical status, localization of injury, morphology of skull

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fractures, volume of hematomas on the frequency of using one or another approach, revealing the features and patterns of the process after neurosurgical intervention and its effectiveness, depending on the treatment strategy used.

Epidural hematomas in 37 (26.6%) patients were removed by freseotomy in 7 cases, and RTX was performed in 30 cases. Subdural hematomas in 72 (51.8%) victims were removed by RTCH in 67 cases, and freseotomy in 3 cases and KPTCH was used in 2 cases. Intracerebral hematomas in 8 (5.8%) patients were removed by performing CPTC in all 8 cases. In 4 (2.9%) bilateral hematomas, freseotomy and radiotherapy were used in 2 cases, respectively. Skull impression fractures in all 18 (12.9%) patients were eliminated by performing RTX ($p<0.05$). We performed 139 operations on 127 patients. In our observations The RTC method prevailed (117 operations - 71.7%), which is associated with the admission of patients to the hospital in the acute period of TBI in severe and extremely severe conditions.

Consideration of the issue in terms of age allows us to reveal certain patterns. Most often, RTX was performed in young and middle-aged people (on average in 3 out of every 4 cases). In persons over 60 years of age, RTX was performed less frequently, in every second patient. As for other surgical methods, KPTCH was performed more often in young patients than in elderly patients, and the method of expanded burr holes, on the contrary, was performed in elderly patients more often than in young patients. As a rule, CPTC was performed in patientsthose without gross dysfunction of the brain stem, as well as in most cases where the localization of traumatic intracranial hematomas was established using an MRI study. It should be noted that the use of KPTCH is very effective for traumatic intracranial hematomas, since hematomas, already in the first hours after injury, contain dense blood clots, when removed, bleeding often resumes.

As one would expect, with CPTC, complete removal of hematomas and restoration of the anatomical relationships of tissues contributed to a faster and more complete restoration of impaired brain functions. In our work, we used the CPTCH both as the first and as the final stage of surgical intervention, as well as as a subsequent stage, which was preceded by partial removal of hematomas through an expanded burr hole. Thus, our observations once again confirmed the well-known position that the use of the KPTCH method with wide exposure of the cerebral hemispheres creates the most favorable conditions for the complete removal of traumatic hematomas, allows for thorough hemostasis even with multiple sources of bleeding, and removes cerebral detritus from areas of brain contusion brain At the same time, we came to the conclusion that conducting the CPTCH were carried out more often, the younger the victims with traumatic intracranial hematomas. The use of KPTCH with layer-by-layer suturing of the wound creates anatomical and physiological prerequisites for early and complete restoration of impaired functions, and relieves patients from the “trepanned skull” syndrome. In this regard, in patients in moderate or satisfactory condition, as well as in the subacute period, this method is absolutely indicated.

In 117 cases (71.7%) RTX was performed. This method was used in cases of severe condition of patients, the presence of severely expressed general cerebral and brainstem neurological symptoms, in the presence of splintered-depressed fractures of the skull bones, with a picture of increasing swelling and dislocation of the brain, i.e. in patients who needed brain decompression. In 15 (10.8%) cases with symptoms of incipient herniation, bilateral infratemporal decompression was performed.

Wide decompression craniotomy in patients with severe brain contusions, often accompanying traumatic intracranial hematomas, in a number of cases, made it possible to save not only life,but also the mental health of the victims. The RTX method was used in 39 (30.7%) young and middle-aged patients. We were once again convinced that the method of resection craniotomy is technically relatively simple and allows for a fairly wide revision of the epi- and subdural spaces, although in this regard it is inferior to the KPTCH method. Removal of traumatic intracranial hematomas through an expanded burr hole was used in 12 cases (20.0%) of 139 operations, and in 8 patients this was done independently as a method, and in the rest as the first stage of treatment,subsequently he produced RTCH or KPTCH. After applying burr holes expanded to 5 cm in diameter, intracranial hematomas were removed by suctioning the subdural space after dissecting the dura mater. At the same time, with the help of a spatula and suction, blood clots were washed out with physiological solution and the liquid part of the hematoma was aspirated.

Removal of traumatic intracranial hematomas through expanded burr holes was used mainly in patients in extremely critical condition, who had impaired vital functions, when it was not possible to perform the operation in a more serious manner.significant volume. In this case, 2 milling holes were placed. In most cases, this method was the first stage of a more radical operation. We used the extended freseotomy method mainly to remove epi- and subdural hematomas. We were convinced that it has a number of significant disadvantages: the impossibility of removing large volume and length traumatic intracranial hematomas of basal localization, the difficulty of removing foci of brain contusion, difficulty in detecting the source of bleeding, insufficient provision of decompression with swelling of the

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brain increasing during the operation and after it. The positive side of this method is its great diagnostic value, speed of technical execution and the fact that it is the most gentle for the patient. Analysis of our own data allows us to state that the use of the method of expanded burr holes is all the more justified the older the victim with traumatic intracranial hematomas, since neurosurgical intervention in these cases should be performed less traumaticly. It seems appropriate to dwell in more detail on the features of tactics of surgical interventions in patients with traumaticintracranial hematomas. The indication for opening the dura mater was tension and bulging of the membrane, its cyanosis, and the absence of pulsation. The membrane was opened in an arcuate or cross-shaped manner in the avascular area. In elderly and senile people, a staged opening of the dura mater seemed to be the most rational, because due to brain atrophy, traumatic intracranial hematomas reached large sizes and dislocation symptoms came to the fore. The gradual opening of the dura mater and removal of the contents of the hematoma prevented brain dislocation. This method of opening the dura mater is justified in young people who have a tendency to cerebral edema.

We found that liquid hematoma is less common in adults, in contrast to young people. Several hours after the injury, the subdural traumatic hematoma is not yet encapsulated. It consists of blood clots that cannot always be washed out or sucked out. In this case, the clots were carefully removed with a spatula. After removal of hematomas, elderly and senile people more often than patients of other age groups experience brain relapse with a sharp weakening of the pulsation of cerebral vessels. The straightening of the brain is facilitated by intravenous administration of saline, plasma in combination with vasodilators. Almost all young and middle-aged patients areas of contusion and crushing of the brain were discovered. In this age group, extensive radical surgical interventions were performed, during which non-viable tissue was removed as much as possible. In patients of older age groups, multiple brain contusions were found, however, taking into account the age of the victims, a low-traumatic, gentle operation was performed in the form of decompression trephination and removal of the hematoma. After removal of hematomas and areas of brain contusion in the postoperative period, inflow and outflow systems were used, which contributed to removing decay products of brain tissue and blood from the area of brain damage, as well as creating local hypothermia. To prevent the formation of liquorrhea and cicatricial adhesions, in 9 (6.5%) cases dura mater plastic surgery was performed with a homograft.

If in the preoperative period the presence of bilateral traumatic intracranial hematomas was established or assumptions were made about their presence, then during the operation simultaneous dissection of the dura mater and opening of the subarachnoid space on both sides were performed. If, after removing a subdural traumatic hematoma on one side and opening the dura mater, no intrathecal hematoma was found, but there were signs of intracranial pressure in the form of prolapse of the brain matter into the surgical wound, signs of brain hyperemia, absence of pulsation or the presence of fluctuations, then a brain puncture was necessarily performed in three directions, after which burr holes were placed on the opposite side. Thus, subdural traumatic hematomas were identified in 29 (20.9%) patients. In our six observations of bilateral traumatic hematomas, the clinical symptoms of two hematomas seemed to neutralize the neurological symptoms of a smaller hematoma on the opposite side. Thus, the features of neurosurgical tactics for traumatic intracranial hematomas determine the nature of age-related brain reactions to traumatic brain injury and surgical trauma.

The younger the victims, the more often the phenomena of post-traumatic cerebral vascular pathology are observed. In this regard, in young people, radical neurosurgical intervention is necessary to remove brain edema. This is ensured by carrying out a wide one-stage flap trepanation with the most complete removal of subdural hematomas and removal of all non-viable tissue from the areas of brain contusion and crushing.

In case of bilateral traumatic intracranial hematomas, their removal should be carried out simultaneously on both sides. When the brain prolapses, all strength should be aimed at combating edema-swelling of the brain. In older age groups, when removing hematomas, one should strive for minimal intervention, but one that ensures sufficient radicalism. In this regard, RTX was performed more often, sometimes in two stages (first, removal of the liquid part of the hematoma and partial clots through expanded burr holes, and then, during the second intervention, complete removal of the clots). Sometimes the operation was limited to only the first stage.

When the brain prolapses through the trepanation window, it is necessary to perform a brain puncture in search of intracerebral hematomas. Considering the high incidence of intracerebral hematomas with increasing age, it makes sense to puncture the brain even in the absence of brain protrusions in elderly and senile people. It must be borne in mind that often after removal of traumatic intracranial hematomas, people in older age groups experience brain relapse with a sharp weakening of the pulsations of the cerebral vessels.

4. CONCLUSION

When planning a method of craniotomy in victims with traumatic compression of the brain, it is necessary to take into account the totality of the clinical picture, data from computer or magnetic resonance imaging of the brain and the content of interleukin-6 in the blood of victims, and in the postoperative period the prognosis should be based on calculating the total risk score.

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