

### Results and conclusions

Intraoperative MG let develop differentiated surgical tactics. Myelography conducted during operation, let diagnose the reversal of spinal stenosis and spinal subarachnoid space.

The analysis of the intraoperative control provided to patients with spinal injuries showed, that myelography let diagnose the state of spinal subarachnoid space during operation, as well as after the correction of a strong kyphotic spinal deformity. It also let diagnose the reversal of spinal stenosis, which is needed to determine further tactics and extent of operative interference.

The obtained results on the use of intraoperative MG proved its higher effectiveness, which let reduce operative interference and avoid excessive laminectomy in 82,4% of patients.

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### TREATMENT OF UNSTABLE VERTEBRAL COMPRESSION FRACTURES

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Surgical treatment of unstable compression fractures of thoracic and lumbar spine, with the purpose of restoring anatomical axis of the damaged spinal part and its functions, remains an important and often unsolvable issue. And at the same time, it is essential not only to diagnose a compression of the vertebral body, but also to determine its severity level, which is of a great importance for revealing the nature of static disorders of the vertebral column. Mistakes in treatment of simple fractures of the vertebral body are caused, in the first place, by unclear differentiation between spine stability and instability that come as a consequence of vertebral column injury.

**The aim** of the current research was to study the treatment results in patients with unstable fractures of thoracic and lumbar spine in acute and early stages.

#### Materials and methods

We examined 251 patients with spinal injuries aged between 16 and 59 years. The most common type of injury were the traumas received in car accidents; among mechanisms of injury prevailed falls from a great height. The majority of the patients (57,8%) had fractures of lumbar spine; fractures of thoracic spine were diagnosed in 23,4%; both vertebral parts were damaged in 8% of all cases. Using different methods, 80,7% of patients were operated. Spinal fractures without cranial and caudal end-plate collapse and cranial disk injury were treated using posterior spinal fusion using shape memory instrumenta-

tion; spinal fractures accompanied by collapse of cranial end-plate and cranial disk injury were treated using anterior transpedicular fixation.

#### Results

Surgical treatment of unstable compression fractures of thoracic and lumbar spine let achieve stabilization and spinal axis extension in 80,8% of the operated patients.

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### STUDYING OF THE MECHANISM OF SECRETION ACETYLCHOLINE IN NERVOUS-MUSCULAR JUNCTION

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One of the main problems of contemporary bioinformatics consists in revealing physical-chemical nature of neural signal generation, as well as some principles of information transmission from neural cell to muscular one. It may be seen as a necessary step to understanding molecular mechanisms of neural system activity.

Neural cells transmit informations by signals that represent electric currents generated by neuron surface membrane. These currents arise due to transferring charges which belong to the ions of sodium, potassium, calcium and chloride. The information transmission process in neuromuscular synapses may be divided into two basic phases: (a) a mediator release from nervous endings caused by neural impulse, and (b) a mediator interaction with postsynaptic membrane that implies the miniature end-plate potentials (MEPP).

The hypothesis on a quantum secretion nature underlies modern views on the mediator release mechanism. Under normal conditions a spontaneous release of bubbles charged with mediator into synaptic fissure takes place. These bubbles are seen as quanta containing intermolecular portions of about acetylcholine molecules. Here the  $Ca^{2+}$  ions which enter into nervous endings during the action potential are the activators of release system. Then some mediator quanta attain the postsynaptic membranes surface that leads to local depolarization registered as membrane potential. In the course of depolarization caused by action potential diffusion across the neurons the quanta release is rapidly increased, and the degree of depolarization in postsynaptic membrane grows. These changes in membrane potential are registered as MEPP values. While attaining a critical value MEPP is transformed into regenerative depolarization process in postsynap-

tic membrane which is registered as an upward phase of action potential. Nevertheless, due to holinesterathic influences, the acetylcholine destruction takes place. It leads to restoring membrane potential on its initial level. As an alternative to quantum-vesicular hypothesis, a possibility to release acetylcholine via specific canals of presynaptic membrane is discussed.

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#### **SURGICAL TACTICS WITH PLURAL ATHEROSCLEROSIS OF VESSELS OF THE NECK**

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As known, 95% of ischemic insult and transient ischemic attacks are connected with atherosclerosis paths, which in the most cases (76,6%) are located in the main vessels of the neck. The cause of ischemic insult in 80% cases is multifocal damage of vessels. Carotid—vertebrobasilar stenosis form in the common structure vessels damages 27,8%.

The results of surgical treatment of 82 patients with hemodynamic significant atherosclerosis damage of more than one extra cranial artery nourishing brain were analyzed. From 2002 to 2009 93 reconstructive operations were made. On the background of universal neurological symptom all patients had the signs of hypo perfusion in vertebral basilar bath (VBB). More often (63,4%) patients had chronic discirculation, 25 (30,5%) of patients had transient ischemic attacks, in other cases ischemic insult is verified.

All patients were examined by angiosurgent, neurologist, cardiologist, otoneurologist, neuroophthalmologist.

Instrumental diagnosis included triplex scanning of vessels of the neck, transcranial Doppler investigation (TDI) with the samples of squeezing of carotid artery and head turning in different directions. Computed tomography of brain, radioopaque or MR-angiography, the widen laboratory research of blood were also made.

During the research 65 patients had bilateral hemodynamic significant stenosis of internal carotid arteries (ICA), and the «carotid steal-syndrome» took place. In 14 cases was defined stenosis of ICA and occlusions of vertebral artery in the first segment. Three patients had bilateral stenosis of carotid and occlusions of one of vertebral artery and it lead to infarct of cerebellum.

In all cases to the patients was made carotid endarterectomy from the general and internal carotid arteries with the plasty of arteriotomy stoma by syn-

thetic patch. In 11 cases endarterectomy was made on contra lateral side. Preferable method of interoperation patronage of brain was the usage of intraluminal temporary bypass. In all cases the constant interoperation monitoring of cerebral blood flow with the help of TDI, control of arterial tension, electrocardiogram and blood saturation was made. After closing the arteriotomy stoma the volumetric blood flow in ICA was measured by method of laser Doppler ultrasounds.

The operation was made on the side of hemodynamic more significant stenosis of ICA with homogeneous atherosclerosis paths or on the vessels, damaged by heterogeneous path. In the case of combination of bilateral stenosis and the damage of vertebral artery the reconstructions was made on the side of occlusion of the latter.

Post operation complications were connected with the light paresis of motor nerves in the field of neck, were reduction to the moment of discharge. The improvement of well-being, psycho neurologic status, full reduction or reducing the symptoms of discirculation in vertebral basilar bath after operation had 56 (68,3%) patients. 10 patients had reducing the frequency and expression of headache, sleep reappeared, but moderate vertigo and swaying while walking were kept. In 5 cases (patients with infarct in vertebral basilar bath) were kept the signs of vestibulocochlear and/or cerebellar syndromes. Repeated or primary insults in the time of supervision from 2 month to 7 years were not registered.

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#### **AUTOGENIC AND HETEROGENE BIO- RECEPTIVE REFLEXES AS A BASIS FOR SELF-REGULATION IN ANIMAL AND PLANT ORGANISMS**

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In the recent decades, development of the cytogenetics was marked by a significant success. With the help of the morphologic methods, were found genomes of many plants and animals; it also let localize some genes in chromosomes that are responsible for different functions in the organism - at the level of a cell, tissue or organ. However, physiological self-regulatory mechanisms of an organism, regarded as a bio-ecological system, and its interaction with the environment, are yet to be researched.

Long-time studies on the inter-reception in blood vessels and tissues, let us offer a concept of a bio-reception (1980), that can be defined as a genetically determined interactive reflex process aimed at