

In order to improve the treatment results, we have analyzed the common treatment schemes offered to patients with concomitant arm injuries, and revealed serious mistakes and complications that make the actions of the secondary aid considerably longer and complicated. The main concern causes late diagnostics of acute arterial blood flow disturbance in an injured arm.

With this view in mind, we developed and introduced into clinical practice a new scheme of emergency angio-trauma aid to patients with concomitant arm injuries. According to this scheme, the medical procedure should be clearly regulated, while taking into account the opinions of all specialists, who provide medical care to the patient and determine further treatment steps.

The proposed innovation has considerably reduced the time period between the first visit to a doctor and the operation. It allows not to miss the best time for the surgery, and considerably reduces the number of the possible complications that appear during the postoperative period and can affect the total result of treatment.

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IMPLEMENTATION OF AN EXPERIMENTAL MODEL OF SECONDARY AID TO PATIENTS WITH CONCOMITANT ARM INJURY

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Problem of secondary surgical care of patients with concomitant arm injuries is regarded in modern surgery as solvable, thanks to use of microsurgery methods.

But many complications caused by a large number of mistakes at the stage of primary care, call for new organization and management technologies in form of a tactical algorithm scheme, which would let reduce their quantity considerably, or in some cases completely avoid them.

The aim of our study was to develop a model of secondary medical care for patients with concomitant arm injuries, and implement it into clinical practice of a multi-specialty hospital.

A conceptually new algorithm scheme of secondary care for patients with concomitant arm injuries was developed and introduced at the department of microsurgery and hand injuries of the Research Institute of Traumatology and Orthopedics, Astana (headed by professor N.D. Batpenov) during the period from 2001 till 2008.

Our study bases on a multi factorial analysis of qualified medical aid provided to 84 patients with concomitant arm injuries, treated at the department of microsurgery and hand injuries of the Research Institute of Traumatology and Orthopedics, Astana, during this time.

The conducted analysis revealed the most typical mistakes, made by the primary care. The main mistake was late diagnostics of acute limb ischemia provoked by a concomitant injury. Revascularization, followed by reperfusion syndrome, considerably complicated further actions of secondary care providers.

Basing on the obtained data, we have developed and introduced a new algorithm scheme of qualified medical aid to patients with concomitant arm injuries, at all stages of medical evacuation. According to this scheme, all tactical and diagnostic steps should follow each other in a clear order; at each stage, the information of the previous one is to be considered.

Newly implemented organization and management algorithm scheme resulted in better surgical results at patients with the above mentioned injuries; the number of mistakes and complications in primary care reduced twofold.

We suppose, that managerial problems of aid to patients with concomitant arm injuries could be solved, if diagnostic and tactical approaches would be clearly scheduled for primary care providers, by means of new organization and management technologies, implemented into clinical practice in form of the algorithm scheme.

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IMPROVING DIAGNOSTICS OF SPINAL STENOSIS CAUSED BY INJURIES

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Despite widely used spinal computer tomography with sagittal reconstruction (CT) and spinal magnetic resonance imaging (MRI) in the clinical practice, myelography (MG) using nonionic contrast agents remains an important diagnostic tool during operation.

The aim of this study was to analyze the results of intraoperative control by means of MG, during the surgeries for the injury-caused spinal stenosis.

Materials and methods

Results of surgical treatment in 17 patients with thoracic and lumbar spine injuries were analyzed. 12 patients had a complex closed spinal cord injuries after falling from a great height, 5 were injured in a car accident. All the patients were operated within one till 3,5 months after the accident.

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-