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## SURGICAL TACTICS FOR VERTEBRO-MEDULLARY TUMORS

**Abstract:** The aim of the study was to improve the results of treatment of vertebro-medullary tumors based on the developed differential surgical tactics. 104 cases of surgical treatment of vertebromedullary tumors were analyzed. Out of these – 51 (49.0%) meningioma, 19 (18.2%) neurological and 11 (10.5%) ependymal; metastases in the spine were in 23 (22.1%) patients. Outcome: the choice of access for the removal of a benign tumor of the spine depends on what structures of the vertebra is affected: when the vertebral organs are injured, anterolateral access is made at the neck level; at the chest level – lateral paravertebral; at the level of the chest-lumbar junction – lateral paravertebral or posteromedial access is used.

Spondylosis and spine fixation are performed in case of impaired ability and.

**Keywords:** vertebra, spinal tumor, medullary tumors, surgical treatment, spine fusion.

**Subject matter.** The term “vertebro-medullary tumors” includes all neoplastic processes in the zone of the spine, such as: intramedullary, extramedullary (coming from the inner lines of the TMO, the dentata, the pial membrane, the intradural part of the spinal root), extradural tumors that are divided into primary -outgoing from the vertebra, periosteum, ligaments, cartilage, outer dura mater and secondary (metastatic). Primary spinal cord tumors among organic CNS diseases range from 1.98 to 3% [1; 3], among them extramedullary subdural neoplasms predominate, reaching, according to a number of authors 50–60% [2; 6; 11]. Secondary benign and malignant tumors growing into the vertebral canal, among all neoplasms of the skeleton, occur in 5–7%. According to US statistics, up to 18000 new cases of metastatic spine lesions are diagnosed annually [4; 8; 9]. T.E. Radomisli et al. (1996) claim that among all spinal tumors metastatic damage occurs in 96%, and only 1–4% are primary benign or malignant tumors.

The ratio of the frequency of occurrence of tumors of the spinal cord and brain tumors according to many authors is approximately from 1: 4 to 1: 6 [1; 5]. Among the primary tumors of the spinal cord, according to A.I. Pastushina (1983), extramedullary intradural tumors dominate, constitutes up to 70% of all spinal tumors. The results of the surgical treatment of primary spinal cord tumors depend on its timing, the radical nature of tumor removal, prevention of spinal cord trauma and the preservation of spinal column stability [8; 10], and all these aspects should be treated in complex [4; 8], but in general they are encouraging – according to a number of authors, positive results of treatment are observed in 60–96% of operated patients [2; 3; 9]. The main method of treating the spinal tumors is surgical. The aim is the decompression of the spinal cord, stabilization of the spine. However, the in-

dications for certain surgical removal technologies based on the histological structure, localization and aggressiveness of the neoplasms have not yet been sufficiently developed (Filipenko V.A., 1998; Tomita K., Toribatake Y., Kawahara N. et al., 1994; Boriani S., Biagini R., De Lure F. et al., 1998).

Currently, the results of surgery for spinal tumors are still unsatisfactory, and the therapy tactics and rehabilitation approaches in the postoperative period are far from perfect (Xu Q., Bao W., Mao R., Yang G., 1996). The high number of postoperative tumor recurrences and the level of disability of the patients makes it necessary to further study the problem, aimed at improving the results of treatment.

**The purpose of research:** To improve the results of treatment of vertebro-medullary tumors on the basis of the developed differentiated surgical tactics.

### **Materials and methods of research**

The work is based on an analysis of the results of 104 surgical interventions in the Department of Spine and Spinal Cord Pathology of the Russian Scientific Neurosurgical Institute in patients with neoplasm of the cervical, thoracic, lumbar spine and spinal cord for the period from 2006 to 2016. 73 (73.4%) of them were men and 31 (26.6%) were women aged between 14 and 72. Of these, 51 (49.0%) meningioma, 19 (18.2%) neuron and 11 (10.5%) ependymomas; metastases in the spine – in 23 (22.1%) patients.

With the help of the diagnostic complex before the operation, it was possible to establish the localization of tumors with respect to the diameter of the spinal cord: the tumors had a dorsal location in 19 (18.2%), dorso-lateral in 18 (17.3%), lateral – 14 (13.4%), ventro-lateral in 17 (16.3%), ventral-in 15 (14.4%), and circular rotation of the caudal peduncle roots in 21 (20.2%) cases. All patients were divided into 5 groups

according to the degree of neurological disorders, according to the ASIA / IMSOP (American Spinal Injury Association / International Medical Society of Paraplegia) scale: 11 patients (10.5%) were assigned to group A, group B – 20 (19.2%), the group C – 59 (56.8%), the group O – 6 (5.7%) and the group E – 8 (7.7%) patients.

### Outcome and discussions.

Indication for surgical intervention in patients with primary spinal cord tumors was the presence of a tumor, compression of the spinal cord or its roots, the threat of a pathological fracture, a pathological fracture with loss of ability to support and the stability of the spine.

Dorsal tumors of the spinal cord, irrespective of their location along the spinal cord line, were removed by anterior access. Dorso-lateral tumors were removed by posterolateral access, depending on the size of the tumor, access was expanded by full laminectomy. Ventral-lateral and ventral tumors were removed by various accesses, the most attention was paid to the size of the tumor. At a giant size, when in the process of slow growth the tumor itself pushes the spinal cord rear or posterolateral approach was used; with a diagnosed tumor of small size (up to 1 cm in diameter and 2 cm in length), access depends on the level of the location of the tumor along the spinal cord: at the cervical level – it can be anterolateral access by Cloward; at the thoracic level – with lateral localization – posterior paravertebral approach.

For the removal of benign tumors, methods of marginal or broad excision of the tumor were used, as well as intra-tumoral excision, including curettage. The operation ended with spondylosis, if the ability to support the supporting structures of the spine and fixation in various ways was damaged. The histological structure of the tumor was established either by biopsy or suggested by characteristic spondylography or computed tomography; or after the operation, when the removed material was examined. All patients in the postoperative period were sent to the oncological dispensary.

As a result of surgical treatment of primary tumors of the spinal cord, an excellent and good result was obtained in 74.1%; satisfactory – in 17.3%; unsatisfactory – in 8.6% of patients.

Patients with a neurological deficit corresponding to group C on the ASIA / IMSOP scale were operated with the possibility of an accurate exit to the tumor structures of the vertebrae.

When analyzing the results in the group of patients with metastatic tumors of the vertebrae, it should be noted that the improvement occurred in patients who attempted to accurately access metastasis and marginal excision with subsequent spondylosis and fixation of the spine. Thus, out of 27 patients operated in connection with malignant and metastatic spinal tumors, the nearest excellent and good result of treatment was obtained in 15, which is 55.5%.

### Findings:

1. The most informative methods for diagnosis of tumors of the spine and spinal cord by leading methods are contrast computer and magnetic resonance imaging (MRI)

2. Access to remove primary tumors of the spinal cord should provide an accurate access to the "target" of the operation. Posteromedial access is used in dorsal tumors, regardless of their location along the spinal cord, or in the ependymoma of the cauda equina. Posterolateral access is used for dorso-lateral location of the tumor at any part of the spinal column; in a modification with expansion to incomplete laminectomy it is used for giant ventro-lateral tumors of any localization. Anterolateral parapharyngeal access at the level of the cervical vertebra should be used for small ventral tumors of the cervical spinal cord.

3. Indications for surgical treatment of tumors of the spine are compression of the spinal cord, persistent pain syndrome and the threat of a pathological vertebral fracture.

4. The choice of access for the removal of a benign spine tumor depends on what structures of the vertebrae are affected by it: when the vertebral bodies are injured, the anterolateral access is made at the cervical level; on the thoracic – lateral paravertebral; at the level of the chest-lumbar junction – lateral paravertebral or anteroposterior access. Spondylosis and fixation of the spine are performed when impaired ability and stability of the vertebral-motor segment are impaired. In the postoperative period, histologically sensitive tumors should be subjected to radiation or chemotherapy.

5. Operations for primary malignant and metastatic tumors of the spine are palliative, aimed at improving the quality of the patient's remaining life, aimed at suppressing the pain syndrome by decompression of the spinal cord and its roots and restoring the stability and ability to support the spinal column. In the postoperative period, according to the indications, it is necessary to carry out chemo- and (or) radiotherapy.

### References:

1. Aliyev M. D. "Tumors of the spine and prospects for their treatment at the present stage of development of vertebralology" / M. D. Aliyev, E. R. Mosayev, E. A. Sushentsov et al // Traumatologist and orthopedist of Russian Federation. 2010.– No. 2.– P. 126–128.
2. Vetrile S. T. Cranio-vertebral pathology / S. T. Vetrile, S. V. Kolesov.– M.: Medicine, 2007.– 320 p.

3. Voronov V. G. Congenital malformations of spinal cord and spine in children / V. G. Voronov. – St-Petersburg, 1998. – 53 p.
4. Gaydar B. V. Surgical treatment of patients with injuries of the spine of thoracic and lumbar localizations / B. V. Gaydar, A. K. Dudayev, V. P. Orlov et. al // Spinal Surgery. 2004. – No. 3. – P. 40–45.
5. Dreval O. N. New technology in the treatment of pathological vertebral fractures / O. N. Dreval, V. I. Semchenko, D. N. Dzu-kayev // Journal "Neurological Matters" under the name of N. N. Burdenko 2009. – No. 3. – P. 19–22.
6. Zozulya Yu. A. Surgical treatment of medullocervical tumors / Yu. A. Zozulya, N. E. Polishuk, E. I. Slynko // Journal "Neu-rological Matters" under the name of N. N. Burdenko. 1998. – No. 1. – P. 6–10.
7. Polyakov Yu. Yu. Microsurgical treatment of patients with tumors of the spine and spinal cord (immediate and long-term results).
8. Usikov V. D., Magomedov Sh. Sh. // Traumotologist and orthopedist of Russian Federation. 2005. – No. 1. – P. 5–8.
9. Aabo K. Central nervous system complications by malignant lymphomas: radiation schedule and treatment results / K. Aabo, S. Walbom-Jorgensen // Int j radiat oncol biol phys. 1986. – Vol. 12. – P. 197–202.
10. Alper M. Transsacral usage of a pure island TRAM flap for a large sacral defect: a case report / M. Alper, U. Bilkay, Y. Kefeci et al. // Ann plastic surg. 2000. – Vol. 44. – P. 417–421.
11. Baber W. W. Periosteal chondroma of the cervical spine: one more cause of neural foramen enlargement / W. W. Baber, Y. Numaguchi, J. A. Kenning et al. // Surg neurol. 1988. – Vol. 29. – P. 149–52.