

EVALUATION OF TREATMENT OUTCOMES IN PATIENTS WITH EXTRADURAL SPINAL CORD TUMORS

Mardanov Jamshid Jaxongirovich -Assistant of the Department of
Traumatology and neurosurgery, PhD
Bukhara State Medical Institute named after Abu Ali ibn Sino,
<https://orcid.org/0009-0007-7760-6050>

Abstract

This study presents an analysis of outcomes in 101 patients who underwent surgical treatment for extradural spinal cord tumors. All patients received comprehensive clinical evaluation. Surgical intervention remains the primary treatment for most primary spinal tumors. However, opinions differ significantly: advocates of anterior approaches consider them superior in radicality compared to posterior surgery, while others prefer combined approaches. Minimally invasive techniques—such as vertebroplasty—are increasingly used, yet no consensus has been reached regarding indications, surgical access, or procedural volume for either primary tumors or spinal metastases. The overall treatment outcomes confirm the appropriateness and effectiveness of the chosen therapeutic strategy.

Keywords: spinal cord tumor, vertebroplasty, neurological disorders, surgical treatment

ОЦЕНКА РЕЗУЛЬТАТОВ ЛЕЧЕНИЯ ПАЦИЕНТОВ С ЭКСТРАДУРАЛЬНЫМИ ОПУХОЛЯМИ СПИННОГО МОЗГА

Марданов Джамшид Джахонгирович - ассистент кафедры
травматологии и нейрохирургии, PhD
Бухарский государственный медицинский институт имени Абу Али ибн Сино,
<https://orcid.org/0009-0007-7760-6050>

Аннотация.

В данном исследовании представлен анализ результатов лечения 101 пациента, перенесшего хирургическое лечение extradуральных опухолей спинного мозга. Все пациенты прошли всестороннее клиническое обследование. Хирургическое вмешательство остается основным методом лечения большинства первичных опухолей спинного мозга. Однако мнения существенно расходятся: сторонники передних доступов считают их более радикальными по сравнению с задней хирургией, в то время как другие предпочитают комбинированные подходы. Все чаще используются малоинвазивные методы, такие как вертебропластика, однако до сих пор не достигнуто единого мнения относительно показаний, хирургического доступа или объема процедур при первичных

опухолях или метастазах в позвоночник. Общие результаты лечения подтверждают целесообразность и эффективность выбранной терапевтической стратегии.

Ключевые слова: опухоль спинного мозга, вертебропластика, неврологические расстройства, хирургическое лечение

Introduction

Modern oncology demonstrates two clear tendencies. On one hand, there is a widespread increase in tumors of various origins, including advanced and late-stage forms. On the other hand, improved therapeutic interventions have significantly extended patient survival. Consequently, new demands arise concerning palliative and symptomatic care, focusing on preventing complications and enhancing patient quality of life[1,3,6].

These issues are particularly pronounced in individuals with spinal tumors, where complications frequently lead to mechanical instability and neurological impairment. Such conditions dominate the clinical picture, reduce quality of life, and may render further multimodal therapy impossible[2].

At present, no unified standards exist regarding the indications, scope, or sequence of surgical interventions for extradural spinal tumors. Questions remain regarding the optimal surgical approach, fixation length, stabilization techniques, and reconstruction after corpectomy. The necessity of surgery itself is occasionally debated due to its primarily palliative nature and the risk of perioperative complications[1,2].

Surgical intervention remains the primary treatment for most primary spinal tumors. However, opinions differ significantly: advocates of anterior approaches consider them superior in radicality compared to posterior surgery, while others prefer combined approaches. Minimally invasive techniques—such as vertebroplasty—are increasingly used, yet no consensus has been reached regarding indications, surgical access, or procedural volume for either primary tumors or spinal metastases[4,5].

Aim of the study

To improve outcomes in patients with extradural spinal cord tumors by establishing criteria for precise topographic diagnosis and differentiated surgical management.

Materials and Methods

This work is based on the clinical evaluation and treatment outcomes of 101 patients with extradural spinal tumors treated between 2018 and 2024. Patient ages ranged from 16 to 75 years; 48 were male and 53 female, with an average age of 40 years.

All patients underwent full clinical assessment. The diagnosis was confirmed intraoperatively and verified histologically.

- Pain was evaluated using the Denis pain scale (1989).
- Quality of life was assessed using the Karnofsky scale (1949).
- Neurological status was graded using the Frankel scale (1969).
- Expected survival was estimated using the Tokuhashi prognostic scoring system (1990).
- Tumor site was classified using Tomita's Surgical Classification (2001).

Results and Discussion

Of the 101 patients, 94 underwent open surgery, while percutaneous vertebroplasty (VP) was performed in 6 cases. In one patient, both open surgery and VP were performed simultaneously. General anesthesia was used in 95 surgeries; VP procedures were done under local anesthesia in 6 cases.

Table 1.

Pain Reduction in the Early Postoperative Period

Tumor Type	Complete Relief	Marked Reduction	Moderate Reduction	Minimal Reduction	Worsening
Benign	6	43	2	3	—
Primary malignant	1	15	2	1	—
Metastatic	—	20	2	5	1
Total (101)	7 (6.9%)	78 (77.4%)	6 (5.9%)	9 (8.9%)	1 (0.9%)

A strong analgesic effect (complete or significant relief) was achieved in 85 patients (84%). A satisfactory effect was noted in 15 patients (14.8%), while an unsatisfactory result was observed in 1 patient, associated with a vertebroplasty complication.

Neurological improvement, defined as at least one-grade elevation on the Frankel scale, was recorded in 84% of patients; neurological decline occurred in 1.2%, and 14.8% remained unchanged.

Table 2.

Neurological Status Before and After Surgery (Frankel Scale)

Preoperative Frankel Grade	A	B	C	D	E
A (3)	3 → A	—	—	—	—
B (0)	—	—	—	—	—
C (19)	—	—	7 → C	12 → D	—
D (25)	—	—	—	21 → D	4 → E
E (54)	—	—	—	3 → D	51 → E

Neurological improvement is the second most important indicator after pain reduction. In group C, 12 of 19 (63.1%) previously non-ambulatory patients regained the ability to walk independently. Overall, 12 of 21 (57.1%) non-ambulatory patients (Frankel A–C) became ambulatory after surgery.

Table 3.

Early Postoperative Outcomes Using the Karnofsky Scale

Outcome	Karnofsky Score (points)
	90
Good	8
Satisfactory	13
Worsening	–

Within 7–10 postoperative days:

- Good outcomes – 61 cases (60%)
- Satisfactory outcomes – 40 cases (40%)
- No poor outcomes were observed.

Patients demonstrated improved mood, appetite, and mobility, contributing to faster rehabilitation.

Discussion

Spinal tumors are most frequently located in the thoracic region, consistent with the findings of Akeyson, McCutcheon, Cybulski, Rompe, and Sundaresan. Comorbidities and the severity of the oncological process significantly influence surgical decision-making. Preoperative assessment must integrate parameters allowing prediction of postoperative results, as recommended by Tokuhashi, who evaluated general health, neurological function, primary tumor type, spinal metastasis location, and extraskelletal metastases.

Bilsky proposed that surgery is advisable when expected survival exceeds six months. Comorbidities—such as cardiovascular, respiratory, renal, or hepatic insufficiency—may directly contraindicate surgery, as described by Bauer and Cybulski.

Among our 101 patients, 23 (22.7%) had significant comorbidities, and 46 were categorized as ASA class III–IV.

Conclusions

The absolute indications for surgical intervention in primary and metastatic spinal tumors are pronounced neurological disorders and persistent pain syndrome that does not respond to conservative therapy, while the choice of optimal surgery tactics is determined by a combination

of factors, including the neurological status of the patient, the histological nature of the neoplasm, the features of localization and prevalence of the pathological process, pain characteristics, the likelihood of a pathological fracture and the expected life expectancy in metastatic lesions, An analysis of the treatment results shows that an individualized approach to surgical intervention planning contributes to more effective pain control, improved neurological functions, and increased patient functional activity. Treatment outcomes demonstrate that individualized surgical planning significantly improves pain control, neurological recovery, and functional status.

References

1. Ahsan M. K. et al. Intradural extramedullary spinal cord tumours: A retrospective study of surgical outcomes //Bangabandhu Sheikh Mujib Medical University Journal. – 2016. – Т. 9. – №. 1. – С. 11-19.
2. Byval'tsev V. A. et al. Factors affecting the outcome of surgical management for extramedullary spinal cord tumors: a multicenter study //Zhurnal Voprosy Neurokhirurgii Imeni NN Burdenko. – 2014. – Т. 78. – №. 6. – С. 15-23.
3. Cristante L., Herrmann H. D. Surgical management of intramedullary spinal cord tumors: functional outcome and sources of morbidity //Neurosurgery. – 1994. – Т. 35. – №. 1. – С. 69-76.
4. Sandalcioğlu I. E. et al. Functional outcome after surgical treatment of intramedullary spinal cord tumors: experience with 78 patients //Spinal cord. – 2005. – Т. 43. – №. 1. – С. 34-41.
5. Patel P. et al. Clinical outcome of intradural extramedullary spinal cord tumors: a single-center retrospective analytical study //Surgical Neurology International. – 2021. – Т. 12. – С. 145.
6. Cooper P. R. Outcome after operative treatment of intramedullary spinal cord tumors in adults: intermediate and long-term results in 51 patients //Neurosurgery. – 1989. – Т. 25. – №. 6. – С. 855-859.

Литература

1. Ахсан М. К. и др. Интрадуральные экстрamedулярные опухоли спинного мозга: ретроспективное исследование результатов хирургических вмешательств // Журнал Медицинского университета Бангабандху Шейха Муджиба. – 2016. – Т. 9. – № 1. – С. 11-19.
2. Бывальцев В. А. и др. Факторы, влияющие на исход хирургического лечения экстрamedулярных опухолей спинного мозга: многоцентровое исследование //Журнал вопросов нейрохирургии имени Н.Н. Бурденко. – 2014. – Т. 78. – № 6. – С. 15-23.
3. Кристанте Л., Херрманн Х. Д. Хирургическое лечение интрамедулярных опухолей спинного мозга: функциональные последствия и источники заболеваемости //Нейрохирургия. – 1994. – Т. 35. – №. 1. – С. 69-76.

4. Сандалчиоглу И. Э. и др. Функциональный исход после хирургического лечения интрамедуллярных опухолей спинного мозга: опыт лечения 78 пациентов //Спинной мозг. – 2005. – Т. 43. – №. 1. – С. 34-41.
5. Патель П. и др. Клинические результаты интрадуральных экстремедуллярных опухолей спинного мозга: одноцентровое ретроспективное аналитическое исследование //Международная хирургическая неврология. – 2021. – т. 12. – С. 145.
6. Купер П. Р. Исход оперативного лечения интрамедуллярных опухолей спинного мозга у взрослых: промежуточные и отдаленные результаты у 51 пациента //Нейрохирургия. – 1989. – Т. 25. – №. 6. – С. 855-859.