

# Patient outcomes related to spinal cord tumours and postoperative quality of life assessment.

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**ABSTRACT** Background: Spinal cord tumours are atypical growths that form within the spinal cord or the surrounding structures. Aim: This paper was interested to study patient outcomes related to outcomes ACT as well as evaluation postoperative. Patients and methods: This paper was conducted a cross-sectional study which aims to study patient outcomes related to spinal cord tumours and postoperative quality of life assessment from various hospitals in Iraq between 14th July 2021 to 26th April 2022 and The patients' condition, and demographic statistical results were also evaluated according to the SPSS SOFT statistical analysis program Results and discussion: This paper was discussed the clinical outcomes of patients who suffered with spinal cord tumours for 60 cases. Our results noticed that back pain was the most common factor of symptoms, which get 27 (45%), as well as males more effected as compare with females where males have 40 (66.67%), but females 20 (33.33%). It aids in determining the appropriate treatment options and assessing the prognosis for these patients. The higher the McCormick Scale score, the more severe the functional impairment caused by the spinal cord tumor.

In contrast, preoperative patients have 50% with grade IV while post-operative has 16.67%, which shows enhance after surgery as well as it leads to develop with quality-of-life grades, especially physical factor, and functional factor. Conclusion: We conclude that patient improvement following spinal cord tumor surgery, where it detects with males have more injured than females. Also, back pain was the most common factor of symptoms. Moreover, our results confirm the improvement of neurological status of spinal cord tumours after surgery, as well as McCormick scale assessment, enrolled that rate of patients through post-operative get a half percentage of total patients with grade I while 45% percentage of total patients have IV score during pre-operative.

**Key words:** Spinal cord tumours; McCormick Scale score; QOL score; MCR Grade.

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## INTRODUCTION

A spinal cord tumor is a tumor mass that develops inside the spinal canal or bones of the spine. A spinal cord tumor, also called an intradural tumor, is a tumor mass that forms in the spinal cord or in the lining of the spinal cord (dura mater). A tumor that affects the bones of the spine (the vertebrae) is called a vertebral tumor [1]. They can be either benign (non-cancerous) or malignant (cancerous). These tumours can originate from cells within the spinal cord itself (primary tumours) or can spread to the spinal cord from other parts of the body (secondary or metastatic tumours) [2-4].

that spinal cord tumours, as literature review, are relatively rare, where the overall incidence of spinal cord tumours was 0.74 per 100,000 person-years, with the most common types being meningiomas, nerve sheath tumours, and ependymomas and that ependymoma, astrocytoma, and hemangioblastoma account for over 90% of primary intramedullary spinal cord tumours.

The risk factors for developing spinal cord tumours and found (a history of bladder stones and indwelling urinary catheters) and were statistically significant risk factors for bladder tumours in spinal cord injury patients.

Identified primary tumor sites as a factor affecting survival in patients with spinal metastases and through study sinag larger vertebral body and smaller spinal canal and Torg/Pavlov ratio were associated with cervical spondylotic myelopathy. [5-7]

The reconstruction of the thoracolumbar vertebrae for metastatic spinal tumours enhanced pain management and sustained mobility for the remainder of the patient's lifespan. [8-10] and that early surgery aiming at complete resection is the primary treatment for presumed spinal ependymomas and that the prognosis after surgery for some myxopapillary ependymomas seems worse than generally believed [11-14].

Spinal cord tumour surgery is often accompanied by various complications. After reviewing the literature, the most prominent risk factors for intraoperative complications were found to be the proximity of the location of the main vessels and

viscera, the development of postoperative liquorrhea, and surgical site infection. Accordingly, careful consideration of these factors should be taken into account during surgical planning and postoperative care [15, 16].

## PATIENTS AND METHODS

This paper was conducted a cross-sectional study which aims to study patient outcomes related to spinal cord tumours and postoperative quality of life assessment from various hospitals in the country Iraq between 14th July 2021 to 26th April 2022. This study was examined the clinical features of Iraqi patients with 60 cases. The SPSS program defined and analysed our clinical outcomes. The paper contributes to the understanding of Iraqi patients with spinal cord tumours and postoperative quality of life assessment. The study provides insights into the clinical features of patients with spinal cord tumours, including age, sex, symptoms, education status, income status, MCR grade, and sensory status. The research focus significance of assessing postoperative QOL in patients with suffer from spinal cord tumours.

According to Figure 2, histopathological diagnosis refers to the examination of tissues and cells under a microscope to determine the presence of disease or abnormality. In this context, the histopathological diagnosis of patients with spinal cord tumours is being examined. Figure 2 shows the number of Iraqi patients with various types of SCT: meningioma, neurofibroma, ependymoma, and astrocytoma.

Our outcomes also provide data on how long patients stayed in the hospital, the number of patients who underwent complete tumor resection, and the average length of hospital stay for patients who had surgery to detect spinal cord tumours, which it can find. These results are defined in Table 2. Furthermore, we assessed the outcomes of patients who underwent surgery for spinal cord tumours by comparing their pre-operative and postoperative McCormick scale scores. The McCormick scale is a grading system used to assess the functional status of patients with spinal cord compression. It ranges from Grade I (normal neurological function) to Grade V (complete paralysis). The table likely presents the number or percentage of patients who improved, remained stable, or worsened in their McCormick scale score after surgery. The comparison between pre-operative and postoperative scores allows for an evaluation of the effectiveness of the surgery in improving the functional status of the patients, and these results can be determined in Table 3.

According to Table 4, we present a table that assesses clinical outcomes based on QOL (Quality of Life). Table 5 has four parameters: physical factor, mental factor, social factor, and functional factor. The Table presents the post-operative values for each parameter. QOL is a measure of an individual's overall well-being and includes physical, mental, social, and functional aspects. Table 5 presents the post-operative values for each parameter, which means the values were measured after a surgical procedure.

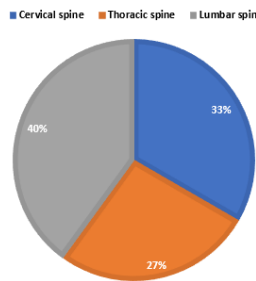
## RESULTS

**Tab 1.** General characteristics of patients Iraqi.

Percentage (%)	Number of patients: 60	Percentage (%)
Age category		
30-40	13	21.67%
41-50	26	43.33%
51-60	21	35.00%
Sex		
Males	40	66.67%
Females	20	33.33%
Symptoms		
Neck pain	8	13.33%
Back pain	27	45%
Difficulty walking	7	11.67%
Pain at the site of the tumor	4	6.67%
Muscle weakness	14	23.33%
Education status		
Primary school	19	31.67%
Secondary school	13	21.67%
Graduated	28	46.67%
Income Status		
Low (200-400) \$	30	50%

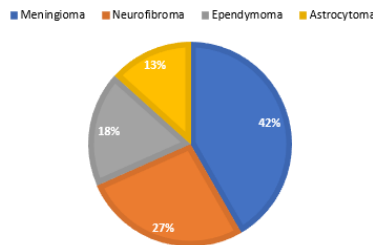
Middle (500-1000) \$	16	26.67%
High, over 1100 \$	14	23.33%
<b>MCR grade</b>		
I	3	5%
II	9	15%
III	28	46.67%
IV	15	25%
V	5	8.33%
<b>Sensory status</b>		
Anesthesia	7	11.67%
Hypoesthesia	30	50%
Normal	5	8.33%
Dissociated sensory loss	18	30%

**LOCATION OF THE INTRADURAL TUMOR**



**Fig 1.** Identification of the location of the intradural tumor.

**HISTOPATHOLOGICAL DIAGNOSIS**



**Fig 2.** Examine the histopathological diagnosis of patients with spinal cord tumours.

**Tab 2.** Detecting outcomes of patients study according to extent of tumor resection

Categories	Number of patients: 60	Percentage (%)
Extent of tumor resection (N, %)		
GTR	40	66.67%
Subtotal resection	14	23.33%
Biopsy	6	10%

Gross-total resection: GTR

This Table found that gross-total resection has the highest extent of tumor resection, which includes 40 (66.67%) and subtotal resection 14 (23.33%), while hospitalization time is  $8.47 \pm 3.5$

**Tab 3.** Assessment of outcomes through comparison between pre-operative and post-operative of spinal cord tumours by McCormick scale score.

McCormick scale score	Pre-operative	Post-operative	P-value
I	5 (8.33%)	27 (45%)	0.0037
II	11 (18.33%)	14 (23.33%)	0.0115
III	14 (23.33%)	9 (15%)	0.0361
IV	30 (50%)	10 (16.67%)	0.0053

McCormick scale score enrolled that patients with grade I post-operative cases with get more improved with 27(45%) in comparison with pre-operative 5(8.33%), and patients with grade IV had riskier (less improved) where 30 (50%) for pre-operative and 10 (16.67%) for postoperative.

**Tab 4.** Assessment of the clinical outcomes based on QOL.

Parameters	Post-operative
Physical factor	53 ± 4.1
Mental factor	53 ± 2.8
Social factor	57.27 ± 1.13
Functional factor	50 ± 2.64

Note: We used a Quality of Life (QOL) scale with a range from 0-100 to evaluate clinical results.

**Tab 5.** Assess the neurological status of spinal cord tumours after surgery.

Parameters	Deterioration	Stabilization	Improvements
Motor power	8 (13.33%)	16 (26.67%)	36 (60%)
Sensory function	5 (8.33%)	20 (33.33%)	35 (58.33%)
Sphincter function	11 (18.33%)	21 (35%)	28 (46.67%)

**Tab 6.** Coefficient correlation scale of clinical outcomes

Parameters	r	P-value
Total score	0.34	0.005
McCormick scale	0.4	0.004
QOL	0.47	0.0036
Symptoms	0.43	0.00247

## DISCUSSION

This study aimed to know the results of patients suffering from spinal cord tumor. The health results were revealed to 60 patients, with ages from thirty to 60 years old, and the patients distributed according to sex to 40 cases of males and females in 20 patients.

Our results noticed that back pain was the most common factor of symptoms, which get 27 (45%), as well as the highest enrolled males, were highest to compare with females where males have 40 (66.67%), but females 20 (33.33%). Similar to previous studies, [17,18].

that various patient populations respond differently to different methods of assessing postoperative quality of life and that a specific questionnaire was more appropriate for assessing HRQL in the immediate postoperative period than the widely used SF-36.

that spinal cord tumor surgery can improve the quality of life for patients. and that surgery for spinal metastases resulted in decreased pain and improved quality of life and. A literature review found that surgical treatment improved the quality of life of patients with spinal metastases from non-small-cell lung cancer over a nine-month assessment period.

that surgical decompression improved quality of life and increased the mean QALY gained per year in patients with symptomatic metastatic spinal cord compression, and as French studies confirmed that patients with spinal cord tumours were most affected by back pain. However, other studies showed that spinal cord tumours can affect both men and women. The incidence of spinal cord tumours is relatively similar between the two genders. However, specific types of spinal cord tumours, such as schwannomas and meningiomas, may have a slight predilection for women. It is important to note that the overall occurrence of spinal cord tumours is relatively rare in both men and women.

According to an American study [19,20], spinal cord tumours can have various effects on patients after surgery, depending on several factors, such as tumor size, location, type, and individual patient characteristics, which depend on the extent of the tumor removal, patients may have permanent functional limitations, including difficulties with fine motor skills, coordination, or dexterity.

Our study detected the location of the intradural tumor where the Lumbar spine was most affected on the patients with 24 (40%) then, following the cervical spine with 20 (33.33%). Moreover, we examined the histopathological diagnosis of patients with spinal cord tumours. Meningioma was the most common type, affecting 25 patients (41.67%). Our study was showed significant outcomes during the assessment of spinal cord tumor patients through the McCormick scale score and QOL score. The McCormick Scale is a clinical classification system used to assess neurological function in patients with spinal cord tumours. It categorizes patients into five different grades based on their neurological deficits and functional impairment caused by the tumor. The grades range from Grade I (no neurological deficit) to Grade V (complete quadriplegia with no motor or sensory function below the level of injury). Our results got patients after surgery have improved in compare with preoperative, where grade I have 45% of patients with post-operative while patients of pre-operative have 8.33%. The McCormick Scale score provides valuable information about the severity of neurological impairment in patients with spinal cord tumours [21]. It aids in determining the appropriate treatment options and assessing the prognosis for these patients. The higher the McCormick Scale score, the more severe the functional impairment caused by the spinal cord tumor. In contrast, preoperative patients have 50% with grade IV while post-operative has 16.67%, which shows enhance after surgery as well as it leads to

develop with quality-of-life grades, especially physical factor and functional factor.

## CONCLUSION

Our outcomes were showed patient improvement in the assessment of spinal cord tumours, where it detects with males have more affected than females. Also, back pain was the most common factor of symptoms. Moreover, our results confirm the improvement of neurological status of spinal cord tumours after surgery, as well as McCormick scale assessment, enrolled that rate of patients through post-operative get a half percentage of total patients with grade I while 45% percentage of total patients have IV score during pre-operative. A thorough assessment of the patient's neurological condition, covering both sensory and motor function, is vital. Therefore, our study suggests radiological investigations (such as MRI or CT scans) should be employed to pinpoint the growth's precise position, magnitude, and spread. Additionally, a comprehensive analysis of the patient's general health is necessary to evaluate their suitability for surgery.

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