Original Article

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Assessment of Quality of Life in Patients Following Total Resection of Convexity Meningioma.

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Abstract

Introduction: Meningioma is the most common type of benign intracranial tumor, representing nearly one-third of the primary brain tumors. Supratentorial convexity meningiomas are the most amenable to gross total resection owing to their favorable location and operative outcome.

Despite the resection and radiological cure, a significant number of patients continue to face troubling postoperative conditions, which include cognitive dysfunction, emotional disturbances, fatigue, and deficits in various social and work activities. These functional and psychosocial outcomes, particularly postoperative QoL, remain scantily documented in the literature. So, a comprehensive evaluation of postoperative QoL is essential to understand the broader impact of the disease and its treatment on patient well-being, and to guide holistic, patient-centered care beyond tumor removal. This study aims to evaluate the quality of life (QoL) in patients with supratentorial convexity meningiomas who have undergone total excision, and to compare their outcomes with those of healthy controls

Material & Methods: A prospective observational study was conducted. Thirty patients with radiologically confirmed total excision of supratentorial convexity meningiomas were evaluated at 3 months post-surgery. QoL was assessed using SF-36 and Lawton's IADL scale. Thirty cases were taken as a control. Statistical analysis was done.

Results: The cases demonstrated significantly reduced scores in SF-36 domains, including physical functioning, role limitations (physical and emotional), social functioning, pain, and general health ($p<0.05$). Fatigue and emotional well-being did not differ significantly. IADL scores were also significantly lower in patients, indicating compromised functional independence.

Conclusion: Despite complete excision, patients with supratentorial convexity meningiomas often continue to experience impairments across multiple quality of life (QoL) domains. These findings highlight the need for comprehensive follow-up care that includes psychosocial support, cognitive rehabilitation, and targeted symptom management.

Keywords: Meningioma, Convexity, QoL, SF-36, Functional independence

Introduction

Meningiomas are the most common primary intracranial tumors, accounting for approximately one-third of all central nervous system neoplasms.(1)Among these, supratentorial convexity meningiomas are among the most common subtypes and are often considered surgically favorable due to their superficial location and well-defined margins.[2,3] These anatomical characteristics enable a high rate of gross total resection (GTR), with correspondingly low recurrence rates and excellent long-term survival outcomes.[4]

Historically, treatment success for meningiomas is evaluated on the basis of certain parameters like extent of resection, recurrence rates, and overall survival.[5] However, there is growing recognition that constitutes a critical component of postoperative assessment—particularly for benign, slow-growing tumors like meningiomas, where patients often survive for many years post-treatment.[6] So, QoL is to be considered and is a multidimensional concept encompassing physical, psychological, social, and cognitive functioning,[7] and it reflects a patient's subjective perception of well-being and functional status after medical or surgical intervention.[8]

Despite its benign histopathology, meningioma can cause some forms of morbidity. Symptoms such as chronic headaches, seizures, cognitive impairment, mood disturbances, and reduced occupational or social functioning may persist long after surgical excision, even in cases deemed clinically successful. [9] These sequelae are often underrecognized in routine follow-up, as traditional imaging and survival-based assessments fail to capture the full spectrum of patient experiences.

Over the past decade, there has been increasing attention in

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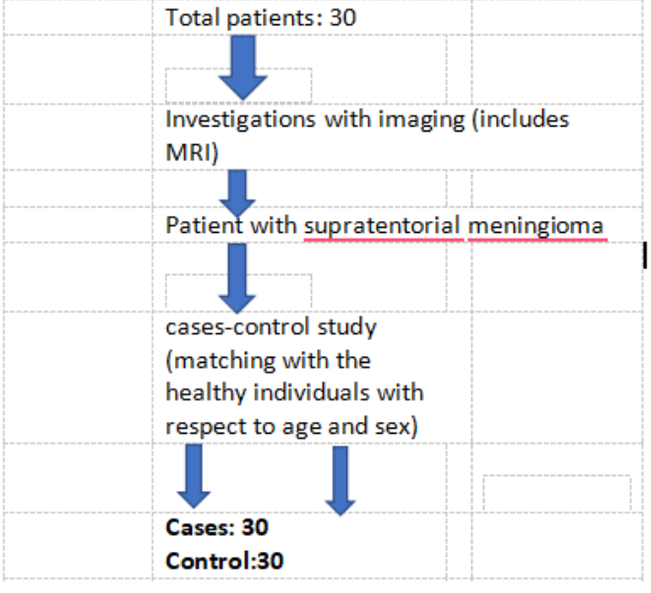
the global neurosurgical community toward integrating QoL measures into outcome evaluation for meningioma patients. Several studies have highlighted the long-term impact of meningioma and its treatment on domains such as memory, attention, emotional regulation, fatigue, and overall life satisfaction.[10-13]

So this study was designed to prospectively evaluate quality of life in patients undergoing gross total resection of supratentorial convexity meningiomas, using validated QoL tools. Outcomes were also compared with age- and sex-matched healthy controls from the general population, to provide a meaningful reference point. The study aims to contribute to a more holistic understanding of patient-centered outcomes in meningioma management in our scenario.

Materials and Methods

This observational study was conducted over 12 months and involved 30 patients who had undergone surgical removal of supratentorial convexity meningiomas. Total excision of the tumor was confirmed by MRI three months after surgery. For comparison, a control group of 30 healthy individuals, matched for age and sex, was also included in the study. After baseline investigations and imaging with the following inclusion and exclusion criteria, we conducted a study



Inclusion criteria: Patients above 18 years of age, of any gender, with no motor deficits, and radiologically confirmed total excision.

Exclusion criteria: Patients were excluded if follow-up imaging showed any residual lesion, or if they had motor deficits, other brain or spinal pathologies, a history of psychiatric illness, or any terminal medical condition.

Assessment Tools:

SF-36 Health Survey – A well-established questionnaire used to assess overall health and well-being, covering both physical and mental health domains.

Lawton's Instrumental Activities of Daily Living (IADL) Scale – Used to evaluate a person's ability to live independently by assessing essential daily tasks required for functioning in the community.

Data-collection:

Patients were assessed three months after surgery. During this visit, demographic details, existing medical conditions, imaging findings, and perioperative information were recorded. The control group also completed the same set of questionnaires to allow for meaningful comparison.

The data were recorded using the MS Excel spreadsheet tool. Descriptive statistics such as means, standard deviations, medians, frequencies, and percentages were used to present the data. A p-value of 0.05 was used as the threshold for statistical significance.

Results

Table 1: Demographic parameters:

Parameters	Cases	Control	p value
Age	46.14±10.37	43.56±13.79	0.18
Gender	Male: 12 Female: 18	Male: 14 Female:16	0.63
Comorbidities (DM,HTN)	16	7	0.006

Table 2: SF36 summary

SF36			
Domain	Cases	control	p value
Physical Functioning	Mean(SD): 70	Mean(SD): 83	0.001
Role limitation due to physical health	Mean(SD): 56.73	Mean(SD): 91	0.001
Role limitation due to emotional well being	Mean(SD): 68.03	Mean(SD): 84.67	0.005
Fatigue	Mean(SD): 52.55	Mean(SD): 49.5	0.401
Emotional well being	Mean(SD): 81.94	Mean(SD): 85.10	0.288
Social Functioning	Mean(SD): 70	Mean(SD): 80	0.001
Pain	Mean(SD): 70.97	Mean(SD): 84.45	0.001
General Health	Mean(SD): 47.47	Mean(SD): 61.20	0.001

Table 3: Lawton and Brody IADL summary:

IADL	Case	Control	P value
	Mean(SD): 6.94	Mean(SD): 7.32	0.012

A total of 30 cases (mean age 46.14±10.37 years; 60% female) and 30 controls (mean age 43.56±13.79 years; 53% female) were included. No significant differences were observed in baseline demographics.(Table 1)

SF-36(as shown in Table 2): Cases demonstrated significantly lower scores in physical functioning (70 vs. 83), role limitations due to physical health (56.73 vs. 91), role limitations due to emotional problems (68.03 vs. 84.67), social functioning (70 vs. 80), bodily pain (70.97 vs. 84.45), and general health (47.47 vs. 61.20). Fatigue and emotional well-being scores were comparable between groups.

IADL(Table 3)Mean score was lower among cases (6.94) than controls (7.32; p=0.012), indicating compromised independence in daily tasks.

These results suggest that even after proven total excision, patients experience persistent limitations across multiple QoL domains.

Discussion

This study shows that gross total surgical excision does not lead to full restoration of quality of life (QoL). Although there is an absence of gross neurological deficits and no radiological evidence of recurrence, many patients continue to experience significant impairments in terms of physical functioning, heightened pain perception, and diminished social role participation.[2,7,14]

Likewise, emotional well-being and fatigue scores did not significantly differ between patients and healthy controls, suggesting that psychosocial resilience, familial support structures, or culturally embedded coping mechanisms may mitigate psychological distress in this population.[15]However, other factors—including communication difficulties, drowsiness, and persistent headaches—remain prominent, highlighting the enduring impact of neurological sequelae, even in the context of radiological cure.[16]

These results emphasize the need for incorporating structured QoL assessments into routine postoperative evaluation and patient counselling.[17] Standard clinical parameters alone may not capture the nuanced challenges patients face in their daily lives.[18] Moreover, the data support a shift toward comprehensive, multidisciplinary long-term care, integrating neuro-rehabilitation, pain and seizure management, psychological support, and social reintegration strategies.

Regular use of validated QoL instruments can aid in identifying patients at risk of poor functional and psychosocial recovery, thereby facilitating more informed patient counseling, expectation management, and timely referral for supportive care services.[19]

Furthermore, the implementation of individualized, multidisciplinary rehabilitation plans(20)involving cognitive remediation, psychological counseling, social support, and occupational therapy has the potential to significantly enhance long-term recovery.

Conclusion

Patients with supratentorial convexity meningiomas experience persistent QoL impairments despite proven total excision. Routine incorporation of QoL assessments can guide patient counseling and allow for individualized rehabilitation plans. Future strategies should integrate cognitive, social, and psychological support alongside standard neurosurgical care.

So the future management strategies should adopt a more holistic, patient-centered approach that extends beyond surgical excision, incorporating structured cognitive, emotional, and psychosocial support as standard components of neurosurgical care that may translate into meaningful improvements in quality of life and overall well-being.

Limitations of the study:

Single centre study, which introduces various biases, emphasizing the need for future multi-centre studies.

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