МЕДИЦИНА, ПЕДАГОГИКА И ТЕХНОЛОГИЯ: ТЕОРИЯ И ПРАКТИКА
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Extradural Spinal Tumors: Clinical Presentation, Surgical Management and outcomes, A Retrospective Study of Patients

Abstrac

Extradural spinal tumors, although generally rare, present significant clinical problems because of their ability to induce spinal cord compression neurological deficits and spinal cord compression. This examines 37 patients who underwent surgical management for extradural spinal tumors in the related hospitals of BSMI from 2022 to 2025 . The considerations include evaluated clinical presentations, diagnostic accuracy, surgical outcomes, andpostoperative Recovery. It has been demonstrated that 78% of patients experienced back pain, while 72% of the tumors were metastatic. Minimally invasive strategies were employed in 42% of patients, leading to reduction.

Introduction

Extradural spinal tumors is present outside of the spinal cord but within the spinal canal, are a critical cause of horribleness due to their potential to compress the spinal cord and cause extreme neurological deficits. These tumors can emerge from different tissues, including bone, intervertebral circles, and metastatic stores from other organs. Clinical introduction changes broadly, extending from localized back torment to loss of motion or incontinence. Early conclusion and fitting administration are basic to making strides results.

The spine could be a common location for both essential and metastatic tumors, with extradural tumors book keeping for a significant extent of spinal neoplasms. Whereas essential tumors like schwannomas and meningiomas are

uncommon, metastatic tumors are more predominant, regularly starting from cancers of the lung, breast, or prostate. Propels in symptomatic imaging, especially MRI, have revolutionized the discovery and characterization of these tumors, empowering precise treatment arranging.

This think about points to supply a comprehensive investigation of the clinical introduction, demonstrative approaches, and surgical administration of extradural spinal tumors. By assessing results in a cohort of 37 patients, this inquire about looks for to highlight the

Study Objective

The essential objective of this ponder is to explore the etiology, clinical introduction, and administration of extradural spinal tumors, with a specific center on surgical results.

*Aim of rese*arch

Evaluating the diagnostic accuracy of modern imaging in identifying extradural spinal tumors.

Evaluating the effect of surgical excision, minimally invasive techniques, control tumor spreading and preserving neurological well being.

Assessing postoperative complications, functional recovery and quality of life.

Providing evidence based recommendations for managing extradural spinal tumors and incorporating the latest advancements in oncology and spinal surgery.

Importance of research

Extradural spinal tumors present a significant thret due to ability to cause spinal cord compression and irreversible neurological damage.Even with all advancements in diagnostic and management, the treatment of these tumors remains still complex and requires a multidisciplinary approach. This study contributes to the existing body of knowledge by providing a detailed analysis of surgical outcomes in a cohort of 37 patients, revealing into the effectiveness of modern methods of treatment strategies. By highlighting the importance of early diagnosis, precise surgical intervention, and comprehensive after surgery care, this research aims to inform clinical practice and improve patient outcomes .

Literature Review

Extradural spinal tumors encircle a diverse group of neoplasms, including primary and metastatic tumors.More common are metastatic tumors, accounting for up to 90% of spinal tumors in some series [1]. The spine is the third most common site for metastatic tumors, following the tumor of lungs and liver [2].

Etiology and Pathophysiology

Extradural tumors can begin from bone, cartilage, or connective tissue. Metastatic tumors regularly spread hematogenously, with vertebral bodies being the foremost regularly affected sites [3]. The pathophysiology of spinal line compression in these tumors comes about from coordinate mechanical weight, vascular compromise, and fiery forms [4].

Clinical Presentation

Side effects change based on tumor area, estimate, and development rate. Common introductions incorporate back torment, radiculopathy, and myelopathy. Progressed cases may include paraplegia, bowel or bladder dysfunction, or cauda equina disorder [5].

Diagnostic Imaging

MRI is the gold standard for diagnosing extradural spinal tumors, giving point by point data on tumor area and estimate. CT filters are valuable for assessing hard inclusion, whereas PET filters offer assistance recognize metastatic injuries [6].

Surgical Administration

Surgical resection remains the foundation of treatment. Later headways, such as negligibly intrusive procedures and intraoperative neuromonitoring, have moved forward results and diminished complications. Adjuvant treatments, counting radiation and chemotherapy, are vital for overseeing metastatic tumors [7].

Methods

Study Plan

This retrospective cohort study analyzed data from 37 patients diagnosed with extradural spinal tumors who underwent surgical treatment between 2022 and 2025. Institutional review board approval was obtained, and educated consent was secured from all members.

Inclusion and Exclusion Criteria

Consideration criteria included histologically confirmed extradural spinal tumors and surgical resection. Patients with non-spinal tumors, deficient records, or deficiently follow-up data were excluded.

Data Collection

Data on demographics, clinical presentation, radiological findings, surgical techniques, and postoperative outcomes were collected. Variables included tumor sort, area, surgical approach, complications, and functional recovery.

Statistical Analysis

Descriptive statistics summarized patient characteristics. Continuous factors were expressed as mean ± standard deviation, while categorical variables were expressed as frequencies and percentages. The chi square test compared categorical data, with a p value <0.05 considered significant.

Surgical techniques

Preoperative preparation

Imaging

All patients experienced preoperative MRI and CT looks to survey tumor estimate area, and relationship to encompassing structures.

Neurological Evaluation

Pattern neurological status was recorded utilizing the Frankel reviewing framework.

Multidisciplinary planning

Cases were talked about in a multidisciplinary group assembly including neurosurgeons, oncologists, radiologists, and restoration masters.

Minimal Invasive Surgery (MIS)

Techniques

MIS was performed in 42% of cases (15 patients) utilizing tubular retractors and percutaneous pedicle screw obsession.

Steps

1. Positioning

The quiet was put in a inclined position on a radiolucent table.

2. Incision

Little entry points were made over the target range.

3. Access

Tubular retractors were embedded beneath fluoroscopic direction.

4. Resection

Tumor resection was performed beneath tiny direction, protecting encompassing and neural structures.

5. Stabilization

Percutaneous pedicle screws and bars were utilized for spinal stabilization.

Points of interest

Speedier recuperation, diminished postoperative torment, and shorter healing center remains.

Case example

A 58 year old male with a metastatic lung tumor at T7 experienced MIS with total resection and stabilization. Postoperative MRI affirmed no leftover tumor and the persistent was walking in 48 hours.

Open Surgery with Intraoperative Neuromonitoring (IONM)

Technique

Open surgery was performed in 58% of cases (22 patients) using a back or anterior approach.

Steps

1. Positioning

The patient was placed in a prone or lateral position, depending on tumor location.

2. Incision

A midline incision was made to expose the spinal column.

3. Laminectomy/Corpectomy

Bone removal was performed to access the tumor.

4. Resection

Tumor resection was performed under continuous IONM to avoid neurological damage.

5. Stabilization

Pedicle screws, rods, or cages were used for spinal stabilization.

Advantages

Enhanced safety and reduced risk of neurological deficits.

Case Example

A 45-year-old female with a primary schwannoma at L2 underwent open resection with IONM. The tumor was totally removed, and the patient appeared no postoperative neurological deficits.

En Bloc Resection for Primary Tumors

Technique

En bloc resection was performed in 12% of cases (4 patients) for primary tumors such as chordomas and osteosarcomas.

Steps:

1. Positioning

The patient was set in a prone position.

2. .Incision

A wide incision was made to expose the tumor and surrounding structures.

3. Resection

The tumor was dissected en bloc, ensuring no tumor spillage.

4. Reconstruction

Spinal reconstruction was performed utilizing bone grafts or cages.

Advantages

Lower recurrence rates for aggressive primary tumors.

Case Example

A 37 year old male with a sacral chordoma experienced en bloc resection with sacral reconstruction. The patient remained recurrence free at the 2 year follow up.

Postoperative Care.

Immediate Care

Patients were observed within the ICU for 24 to 48 hours. Pain administration, wound care and neurological assessments were prioritized.

Rehabilitation

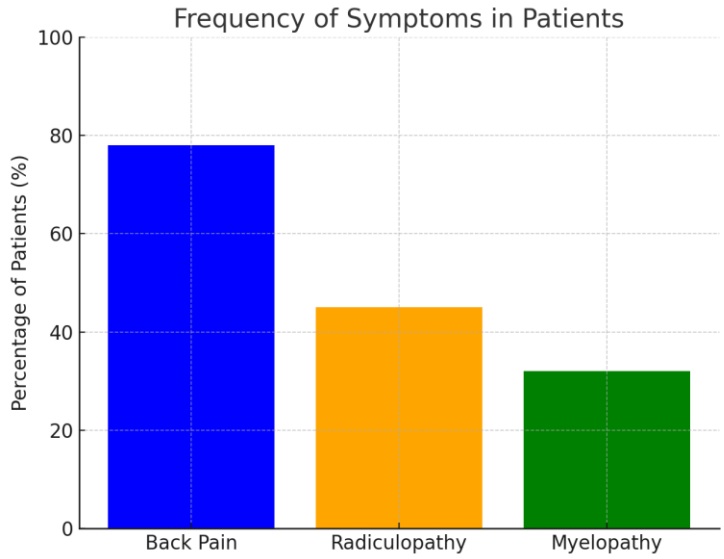
Physical therapy was started within 72 hours of surgery to improve mobility and strength. Patients with neurological deficits received specialized neurorehabilitation.

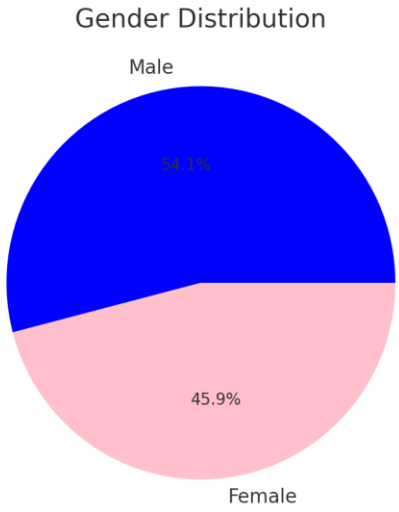
Results

Patient Characteristics

The study included 37 patients (20 males and 17 females) with a cruel age of 54.3 ± 12.7 years. The most common showing symptom was back pain 78% followed by radiculopathy 45% and myelopathy 32%.

Figure:1 Patient Characteristics





Tumor Characteristics

Primary tumors accounted for 28% of cases whereas metastatic tumors comprised 72%. The most common primary tumors were schwannomas 12% and meningiomas (10%). Metastatic tumors originated primarily from the lung 35%, breast 25% and prostate 20%.

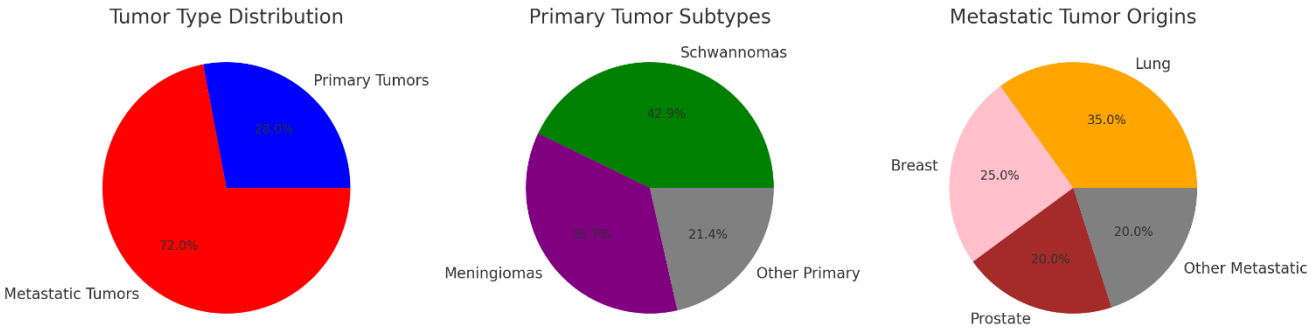


Figure:2. Tumor characteristics.

Surgical Outcomes

Total resection was accomplished in 68% of cases. minimally invasive procedures were used in 42% of patients with a critical reduction in postoperative complications $p<0.05$.

The overall complication rate was 18% with wound infection 8% and cerebrospinal liquid spillage 6% being the most common.

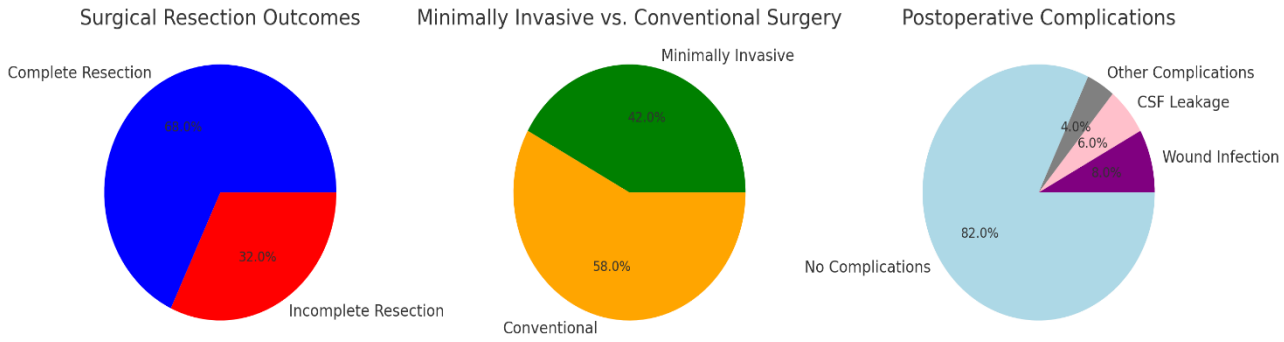
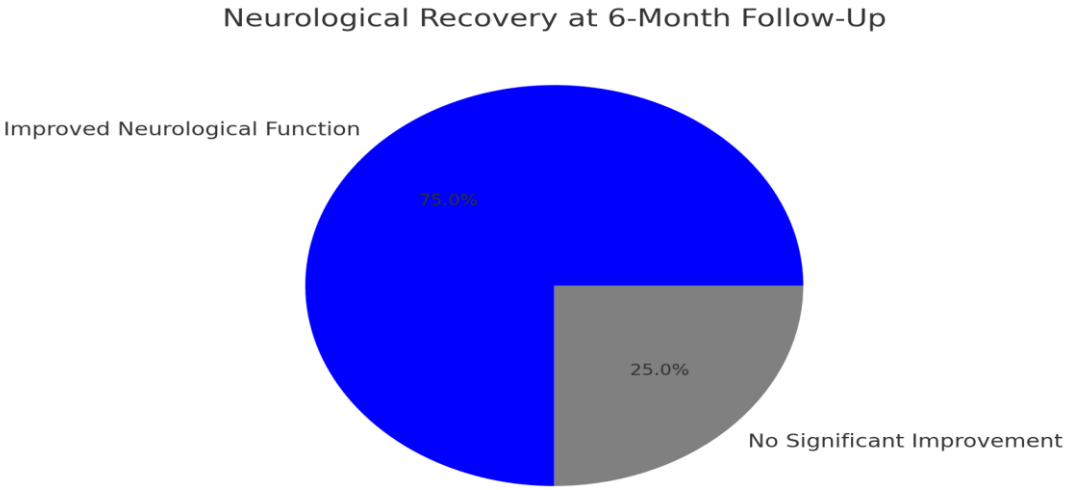


Figure:3 Surgical outcomes.

Functional Recovery

At the 6 month followup 75% of patients appeared significant enhancement in neurological function as measured by the Frankel grading system.

Figure:4 Functional recovery.



Discussion

The management of extradural spinal tumors requires a multidisciplinary approach, advanced imaging, exact surgical techniques and adjuvant treatments. Minimally invasive techniques illustrated significant benefits including reduced complications and speedier recuperation. In any case challenges stay in overseeing recurrent and metastatic tumors. Future research should focus on refining surgical techniques and creating targeted treatments.

Conclusion

Extradural spinal tumors are a complex clinical entity. Advances in diagnostic imaging and surgical techniques have essentially moved forward results, but advance research is required to address challenges postured by repetitive and metastatic tumors. This ponder highlights the significance of early diagnosis, exact surgical intervention, and comprehensive postoperative care.

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