

ABSTRACT NO:03
RESEARCH ARTICLE**Incidence and Molecular Marker Association with Drop Metastases in Ependymoma Patients -A 25-year Experience from a Tertiary Care Center**

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Abstract

Objective: Ependymomas are neuroepithelial tumours capable of CSF dissemination, leading to spinal drop metastases. The incidence, risk factors, and clinical impact of this dissemination remain unclear. This study evaluated the incidence, predictors, and outcomes of drop metastases in patients with cranial and spinal ependymomas treated over a 25-year period.

Methods. A retrospective cross-sectional study was conducted at Aga Khan University Hospital, Karachi including all patients with histologically confirmed cranial or spinal ependymomas who underwent surgery between 1st June 2000 to 30th June 2025. Demographic, clinical, radiological, pathological, and follow-up data were reviewed. Drop metastases were identified by contrast-enhanced whole-neuroaxis MRI and/or positive CSF cytology. Univariable and multivariable logistic regression analyses were performed.

Results Preoperative spinal drop metastases were detected in 8/75 (10.7%) patients with available MRI. Detection was significantly higher with whole-neuroaxis MRI done in 5 out of 12 patients (41.7%) than spine-only MRI done in 3 out of 28 patients (10.7%) or brain-only MRI ($p < 0.001$). Tumour location was significantly associated with preoperative spinal drop metastases, with infratentorial and spinal tumours demonstrating higher dissemination rates than supratentorial tumours ($p = 0.045$). Histopathological subtype was also significantly associated with metastasis, with myxopapillaryependymoma showing a greater propensity for dissemination ($p = 0.049$). No significant associations were found with age, tumour volume, symptom duration, functional status, WHO grade, hydrocephalus, radiological characteristics, or neurological deficits (all $p > 0.05$). CSF cytology was available for 47 patients, of whom 10 (21.3%) had positive results. All positive cytology cases had corresponding MRI-confirmed metastases, and no additional metastases were identified by CSF cytology alone. No significant differences were observed in overall or progression-free survival

Conclusion: Drop metastases occurred in approximately 8/75 (10.7%) of patients and were detected more frequently with whole-neuroaxis MRI. Routine whole-neuroaxis MRI at initial staging may improve early detection of CSF dissemination and guide treatment planning.

Keywords: (Ependymomas, Drop Metastases, Neuro-axis imaging)

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