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abstract

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Outcomes of Congenital Brain Tumors: A Single Centre Experience in an LMIC

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Introduction: Congenital brain tumors (CBTs), defined as those diagnosed within the first year of life, have an incidence of 1.1–3.4 per million live births and show epidemiology, histology, and outcomes distinct from older children. Most studies have small sample sizes and come from high-income countries, limiting relevance to LMICs, as there are limited documented experiences for LMICs. The largest single-center study to date had a sample size of 70 patients. Our objective was to review the prevalence and outcomes of CBT resection at Aga Khan Hospital from 1988 to 2025.

Methodology: We conducted a retrospective cohort study at the Aga Khan Hospital among patients <1 year of age who had undergone gross total (GTR) or subtotal resection (STR) for CBT from January 1988 to July 2025 using patient records.

Data was collected on tumor characteristics, demographics, treatments, and outcomes. Patients with extracranial metastatic tumors were excluded. Analysis was done using SPSS, with the significance level set at 95%.

Results: Thirty-six infants underwent surgery for CBTs. Mean age at surgery was 214 ± 116 days; 39% were female. Most (88%) presented with symptoms, and 75% had preoperative hydrocephalus, with 56% requiring CSF diversion. Tumors were predominantly supratentorial in low-grade (90%) vs high-grade (52%) cases ($p < 0.001$); high-grade tumors were more often midline (52% vs 20%, $p = 0.018$). Extent of resection included GTR in 11 (31%), STR in 20 (56%), and biopsy/debulking in 5 patients. 11 (31%) received adjuvant chemotherapy, and 1 received radiotherapy. Postoperative CSF diversion was required in 16 (44%).

Overall mortality was 25% (9/36): 30-day (8%), 6-month (8%), and 1-year (8%), with no deaths beyond 1 year. Mortality was higher in high-grade tumors (48% vs 12%, $p = 0.001$).

Conclusion: Congenital brain tumors in infants remain challenging, with outcomes primarily determined by tumor grade and location, while low-grade tumors generally show a more favorable prognosis.

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