AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences
Volume 3, Issue 2, 2025 ISSN (E): 2993-2149

Treatment results for drug-resistant epilepsy with polymicrogyria

Azamova Nigina Ulugbek qizi, Bekova Shakhzoda Davlatbek qizi, Ismoilova Khusnora Tursunboy qizi
Students of group 502 of the 2nd medical faculty of the Samarkand State Medical University,
Abduvoitov Bobur Bakhodirovich

Abstract: Polymicrogyria (PMG) is a malformation of cortical development (MCD) and is classified as an ICD secondary to abnormal post-migration neuronal development [[1], [2], [3], [4]]. In addition to the spectrum of neurological diseases, 65–87% of patients with PMG develop epilepsy, and most experience seizures within the first five years of life [1]. Approximately 65% of patients with PMG-associated epilepsy have drug-resistant epilepsy (DRE). Epilepsy surgery should be considered in these patients with DRE associated with PMG [1,5,6]. Although epilepsy surgery has been shown to be superior to continuous anticonvulsant medication alone for seizure control in a subset of appropriately selected patients with EMH-associated ED [[7], [8], [9]], only 5% of all MCI-associated epilepsy surgeries target EMH-associated epilepsy [10]. The complexity of surgery in these patients reflects the presence of extensive (sometimes bilateral) brain malformations in many cases, and the fact that the EMH cortex typically maintains normal brain function [[1], [11]]. Given these concerns, healthcare providers may choose not to perform surgery in this particular group of patients with EMH, and thus surgery is underutilized or delayed [10].

Keywords: polymicrogyria, epilepsy, resection**.**

Introduction.

Over the past few years, animal models of PMG have been studied in an attempt to understand the heterogeneous epileptogenicity in PMG-associated epilepsy. Such studies indicate that abnormalities in both inhibitory and excitatory pathways and neural connections are found not only in the PMG tissue but also around the paramicrogyri area or in the contralateral hemisphere. Consistent with observations in animal models, recent reports indicate that the epileptogenic zone (EZ) may or may not be associated with the PMG itself, and perhaps distant cortical areas or adjacent cortex may be more epileptogenic than the PMG cortex. PMG typically involves extensive lesions with multiple microgyri, and therefore intracranial electroencephalography (ICEEG) may be required to identify and delineate the EZ, as well as to define the boundaries of the functional cortex to reduce the risk of functional deficits following surgical resection. The literature on intracranial EEG findings in PMG is limited, especially in patients with bilateral PMG.

The aim of our study was to determine the determinants of long-term seizure outcome and extent of resection in patients with PMG-related epilepsy from a single institution who underwent surgical resection, with or without intracranial assessments.

Purpose of the study. Our aim was to analyze seizure outcomes and determine ictal seizure onset using intracranial electroencephalography (ICEEG) in patients with drug-resistant epilepsy (DRE) associated with polymicrogyria (PMG), taking into account the surrounding cortex and extent of surgical resection.

Methods

A retrospective study of patients diagnosed with PMG (2001 to June 2018) in a single epilepsy center was conducted. The primary outcome was seizure freedom (SF) based on the Engel

classification with a follow-up of ≥ 1 year. Univariate analysis identified prognostic clinical variables that were later integrated into multivariate Cox proportional hazards models.

Results

Thirty-five patients with EF associated with PMG (19 adults/16 children: 20 unilateral/15 bilateral) were studied. In the surgical group (n = 23), 52% achieved BE (mean follow-up: 47 months), whereas none of the patients in the non-resection group (n = 12) achieved BE (mean follow-up: 39.3 months) (p = 0.002). Within the surgical group, there were no significant differences in BE based on PMG laterality [unilateral or bilateral, p = 0.35], perisylvian involvement (p = 0.714), and extent of PMG resection [complete or partial, p = 0.159]. Patients with ictal onset of IECEG in both the PMH and non-PMH cortex, as well as patients with non-PMH cortex restriction, were more likely to achieve BE compared to patients with PMH cortex restriction.

Conclusion

IEC-guided resection surgery to define the epileptogenic zone (EZ) in patients with FRE and PMG results in favorable seizure outcomes. Focal surgical resection(s) guided by IEC-guided surgery may result in BE in patients with bilateral or extensive unilateral PMG. IEC-guided surgery helps in localizing the EZ within and/or beyond the PMG identified by MRI. Complete resection of the PMG identified by MRI does not guarantee BE. Therefore, developing preimplantation hypotheses based on the assessment of epileptogenic networks during preoperative evaluation is critical in this group of patients.

List of references

1. Mamadaliev, A. M., and M. A. Aliev. "The Importance of the Duration Disorders of Consciousness to Prognosis of the Outcome of Cranio-Cerebral Trauma."Proceedings of XIV WFNS Congress, Boston, USA. 2009.

2. Aliev M. A., Mamadaliev A. M. Study of Efficacy of Endocystal Ozonetherapy in the Operative Treatment of Posttraumatic Arachnoidal Cysts //Proceedings of XV WFNS Congress,(FA0754)., Seoul, Korea. – 2013. Aliev M. A., Mamadaliev A. M. Study of Efficacy of Endocystal Ozonetherapy in the Operative Treatment of Posttraumatic Arachnoidal Cysts //Proceedings of XV WFNS Congress, (FA0754)., Seoul, Korea. – 2013.

3. Aliev, M. A., and A. M. Mamadaliev. "Macronutrient composition of biological media in patients with post-traumatic cerebral arachnoiditis."Proceedings of VIII All-Russian Scientific-Practical Conference "Analytical reliability and diagnostic value of laboratory medicine," Journal of Laboratory. No. 1. 2013.

4. Aliev, M. A., A. M. Mamadaliev, and S. A. Mamadalieva. "The effectiveness of endolumbal insufflation of ozone and pyracetam in the treatment of posttraumatic cerebral arachnoiditis."International Journal of Scientific Research 10-4 (41) (2015): 45-51.

5.Bakhritdinov B.R., Aliev M.A., & Mardieva G.M. (2022). MULTIVOXEL MAGNETIC RESONANCE SPECTROSCOPY IN THE DIAGNOSIS OF BRAIN TUMORS.World Bulletin of Public Health, 8, 149-156.

6. Mamadaliev, A. M., et al. "By studying the composition of macronutrients are in biological media in post-traumatic cerebral arachnoiditis."Abstracts of 10th Russian Scientific-Practical Conference of "Polenov reading's", St. Petersburg, Russian Federation. 2011.

7. Mamadaliev, A. M., M. A. Aliev, and K. Dj Saidov. "The Research Of Different Methods Efficiency Of Posttraumatic Valve Defects Plasty."European Journal of Molecular & Clinical Medicine 7.03 (2020): 2020.

8.Aliev Mansur Abdukholikovich, and Mamadaliev Abdurakhmon Mamatkulovich. "Study of changes of macro- and microelements composition in the cerebrospinal fluid in patients with consequences of craniocerebral trauma" European research, no. 9 (10), 2015, pp. 95-101.

9.Aliev, M. A., A. M. Mamadaliev, and S. A. Mamadalieva. "Research of essential elements composition in the cerebrospinal fluid in patients with outcomes of traumatic brain injury." International Scientific Journal 9 (2015): 17-23.

10.Aliev, Mansur Abdukholikovich, and Abdurakhmon Mamatkulovich Mamadaliev. "Study Of Clinical And Neurological Changes In Patients With Different Outcomes Of Traumatic Brain Injury After Endolumbar And Intracystal Ozonotherapy."European Journal of Molecular &

Clinical Medicine 7.03 (2020): 2020.
11. Aliev, M. A., et al. "Use of Magnetic Resonance Spectroscopy for the Diagnosis of Brain Tumor Recurrence."Journal of Applied Spectroscopy 89.5 (2022): 898-904