

Section: MONOGRAPH

Abstract: MON-05

Comparison between surgical treatment options for Hypothalamic Hamartomas: A systematic review

Yassmin Wichert Sabri Farid, Paulo Henrique Pires de Aguiar Abstract

Centro Universitário FMABC, Santo André, Brazil

yassminwsf@gmail.com

INTRODUCTION: Hypothalamic hamartomas (HH) are rare congenital lesions located in the ventral portion of the hypothalamus. They clinically manifest through a triad including central precocious puberty, cognitive-behavioral decline, and drug-resistant epilepsy, typically characterized by gelastic seizures (unmotivated laughter). Due to the deep location and proximity to vital structures such as the optic chiasm and mammillary bodies, surgical intervention is a technical challenge. This study aims to establish the efficacy and side effects of surgical approaches through a systematic review. **METHOD:** A systematic review was conducted following PRISMA criteria and Ministry of Health guidelines. Searches were performed in MEDLINE/PubMed, EMBASE, and Cochrane Library databases using descriptors such as "Hypothalamic hamartomas" and "gelastic seizures". Pediatric studies on microsurgery, radiosurgery, and thermocoagulation published between 1990 and 2024 were included. Quality was assessed via RoB-2, ROBINS-I, and the JBI checklist. **RESULTS:** A transition toward minimally invasive methods was observed. Laser therapy (MRgLITT) showed seizure freedom in up to 72.3%. SEEG-guided radiofrequency thermocoagulation (RFTC) achieved 90% seizure absence in specific series. Gamma Knife radiosurgery (GKS) was effective in 40% to 75% of cases, with a response latency of up to 3 years. Major complications included hemiparesis, hypothyroidism, and memory deficits. Minor effects such as transient edema and weight gain were frequent. **DISCUSSION:** Technical choice correlates with the Delalande classification. Types I and II lesions allow less invasive methods, while giant hamartomas (type IV) may require direct resection. The efficacy of thermal ablation depends on the disconnection of the epileptogenic circuitry rather than total lesion elimination. Seizure control (Engel Scale) is associated with behavioral and cognitive improvement. **CONCLUSION:** Management must be individualized according to the lesion's anatomy. Minimally invasive strategies (MRgLITT and RFTC) are first-line due to high efficacy and lower morbidity. Technical selection is vital to optimize outcomes and reduce permanent risks.

KEYWORDS: Hypothalamic hamartomas; Stereotactic radiosurgery; Laser thermal ablation; Gelastic seizures.