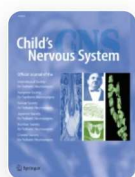


Rare regression of congenital brainstem high-grade glioma: case report and literature review

Case Report Published: 24 January 2025


Volume 41, article number 94, (2025) [Cite this article](#)



[Child's Nervous System](#)

[Aims and scope](#)



[Submit manuscript](#)

[Shi Hui Ong](#), [Mervyn Jun Rui Lim](#), [Char Loo Tan](#), [Miriam Santiago Kimpo](#), [Balamurugan A. Vellayappan](#), [Ai Peng Tan](#), [Cynthia Hawkins](#), [James Rutka](#) & [Vincent Diong Weng Nga](#) 

 1 Altmetric

Abstract

Congenital infantile brainstem high-grade gliomas (HGGs) are extremely rare. Given the limited literature characterizing this disease, management of these tumors remains challenging. Brainstem HGGs are generally associated with extremely poor prognosis. Limited reports of spontaneous regression of radiologically diagnosed infantile brainstem tumors exist in published literature. In this case report, we document the first histologically proven congenital brainstem HGG with molecular characteristics that did not fall under any previously well-defined pediatric brain tumor classifications. The tumor underwent regression after biopsy, documented on neuroimaging up to 2 years of age. A review of the literature was also performed to identify previously reported infantile brainstem HGGs and the management for such tumors. Our case highlights the value of performing histopathological confirmation to guide management and the possible existence of a subcategory of a congenital brainstem HGG with better prognosis.

 This is a preview of subscription content, [log in via an institution](#)  to check access.

Access this article

[Log in via an institution](#)

[Buy article PDF 39,95 €](#)

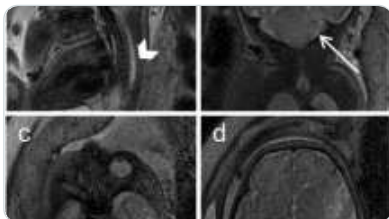
Price includes VAT (Italy)

Instant access to the full article PDF.

Rent this article via [DeepDyve](#) 

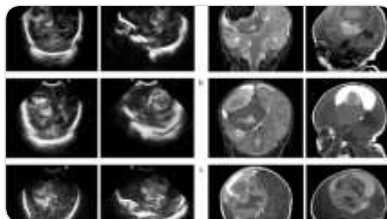
[Institutional subscriptions](#) →

Similar content being viewed by others



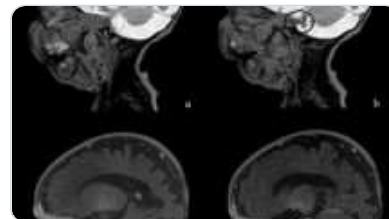
[Long-term survival of an infant with diffuse brainstem lesion diagnosed by prenatal MRI: a case...](#)

Article | 23 February 2016



[Diagnostic challenges of an incidental finding: case report of definitely-congenital glioblastoma...](#)

Article | Open access
14 December 2021



[Central nervous system tumours in neonates: what should the neonatologist know?](#)

Article | Open access
11 January 2024

Data availability

No datasets were generated or analysed during the current study.

References

1. Louis DN, Perry A, Wesseling P et al (2021) The 2021 WHO classification of tumors of the central nervous system: a summary. *Neuro Oncol* 23:1231–1251. <https://doi.org/10.1093/neuonc/noab106>
[Article](#) [CAS](#) [PubMed](#) [PubMed Central](#) [Google Scholar](#)

2. Norris GA, Willard N, Donson AM et al (2023) PDGFB:APOBEC3C fusion in congenital diffuse high-grade glioma of the brainstem. *J Neuropathol Exp Neurol* 82:183–186. <https://doi.org/10.1093/jnen/nlac112>
[Article](#) [CAS](#) [PubMed](#) [Google Scholar](#)

3. Shah NC, Ray A, Bartels U et al (2008) Diffuse intrinsic brainstem tumors in neonates. Report of two cases. *J Neurosurg Pediatr* 1:382–385. <https://doi.org/10.3171/ped/2008/1/5/382>
[Article](#) [PubMed](#) [Google Scholar](#)

4. Satrom KM, Phelan RA, Moertel CL et al (2017) Neonatal respiratory failure caused by congenital diffuse intrinsic pontine glioma. *J Child Neurol* 32(533–536):20170124. <https://doi.org/10.1177/0883073816689640>
[Article](#) [Google Scholar](#)

5. Kostadinov S, de la Monte S (2017) A case of congenital brainstem oligodendroglioma: pathology findings and review of the literature. *Case Rep Neurol Med* 2017(2465681):20170726. <https://doi.org/10.1155/2017/2465681>
[Article](#) [Google Scholar](#)

6. Thompson WD Jr, Kosnik EJ (2005) Spontaneous regression of a diffuse brainstem lesion in the neonate. Report of two cases and review of the literature. *J Neurosurg* 102:65–71. <https://doi.org/10.3171/ped.2005.102.1.0065>
[Article](#) [PubMed](#) [Google Scholar](#)

7. Schomerus L, Merckenschlager A, Kahn T et al (2007) Spontaneous remission of a diffuse brainstem lesion in a neonate. *Pediatr Radiol* 37(399–402):20070223. <https://doi.org/10.1007/s00247-007-0424-2>

[Article](#) [Google Scholar](#)

8. Suo-Palosaari M, Rantala H, Lehtinen S et al (2016) Long-term survival of an infant with diffuse brainstem lesion diagnosed by prenatal MRI: a case report and review of the literature. *Childs Nerv Syst* 32(1163–1168):20160223. <https://doi.org/10.1007/s00381-016-3045-y>

[Article](#) [Google Scholar](#)

9. Swenson DW, Nickel BJ, Boxerman JL et al (2013) Prenatal MRI characterization of brainstem glioma. *Pediatr Radiol* 43(1404–1407):20130516. <https://doi.org/10.1007/s00247-013-2706-1>

[Article](#) [Google Scholar](#)

10. Airewele G, Miller G, McCluggage C et al (2007) Lesion regression. *J Neurosurg* 107:80–81. <https://doi.org/10.3171/ped-07/07/080>

[Article](#) [PubMed](#) [Google Scholar](#)

11. Gabel BC, Yoon J, Levy ML et al (2014) A diffuse intrinsic pontine glioma in a neonate diagnosed by MRI. *BMJ Case Rep* 2014:20140121. <https://doi.org/10.1136/bcr-2013-202270>

[Article](#) [Google Scholar](#)

12. GuerreiroStucklin AS, Ryall S, Fukuoka K et al (2019) Alterations in ALK/ROS1/NTRK/MET drive a group of infantile hemispheric gliomas. *Nat Commun* 10(4343):20190925. <https://doi.org/10.1038/s41467-019-12187-5>

[Article](#) [CAS](#) [Google Scholar](#)

13. Adamski J, Tabori U, Bouffet E (2014) Advances in the management of paediatric high-grade glioma. *Curr Oncol Rep* 16:414. <https://doi.org/10.1007/s11912-014-0414-0>

[Article](#) [CAS](#) [PubMed](#) [Google Scholar](#)

14. Koschmann C, Zamler D, MacKay A et al (2016) Characterizing and targeting PDGFRA alterations in pediatric high-grade glioma. *Oncotarget* 7:65696–65706. <https://doi.org/10.18632/oncotarget.11602>

[Article](#) [PubMed](#) [PubMed Central](#) [Google Scholar](#)

15. Watkins MO, Tate AD, Lewis JS et al (2022) Spontaneous regression of laryngeal squamous cell carcinoma after biopsy. *Ear Nose Throat J* 101:59–61. <https://doi.org/10.1177/0145561320939834>

[Article](#) [PubMed](#) [Google Scholar](#)

16. Sasamoto M, Yamada A, Oshi M et al (2023) Breast carcinoma with spontaneous regression after needle biopsy: a case report and literature review. *Gland Surg* 12(853–859):20230613. <https://doi.org/10.21037/gs-22-629>

[Article](#) [Google Scholar](#)

17. Parsa CF, Hoyt CS, Lesser RL et al (2001) Spontaneous regression of optic gliomas: thirteen cases documented by serial neuroimaging. *Arch Ophthalmol* 119:516–529. <https://doi.org/10.1001/archophth.119.4.516>

[Article](#) [CAS](#) [PubMed](#) [Google Scholar](#)

18. Packer RJ, Pfister S, Bouffet E et al (2016) Pediatric low-grade gliomas: implications of the biologic era. *Neuro Oncol* 19:750–761. <https://doi.org/10.1093/neuonc/now209>

[Article](#) [CAS](#) [PubMed Central](#) [Google Scholar](#)

Author information

Authors and Affiliations

Yong Loo Lin School of Medicine, National University of Singapore, Singapore, Singapore
Shi Hui Ong

Division of Neurosurgery, Department of Surgery, National University Hospital of Singapore, 5 Lower Kent Ridge Rd, Singapore, 119074, Singapore
Mervyn Jun Rui Lim & Vincent Diong Weng Nga

Department of Pathology, National University Hospital of Singapore, Singapore, Singapore
Char Loo Tan

Division of Pediatric Hematology and Oncology, Department of Pediatrics, Khoo Teck Puat – National University Children’s Medical Institute, National University Hospital, Singapore, Singapore

Miriam Santiago Kimpo

Department of Radiation Oncology, National University Cancer Institute, Singapore, Singapore
Balamurugan A. Vellayappan

Department of Diagnostic Imaging, National University Hospital of Singapore, Singapore, Singapore

Ai Peng Tan

Department of Pediatric Laboratory Medicine, The Hospital for Sick Children, Toronto, Canada
Cynthia Hawkins

Division of Neurosurgery, The Hospital for Sick Children, Toronto, Canada

James Rutka

Contributions

All authors contributed to the study conception. Material preparation was prepared by Shi Hui Ong, Mervyn Jun Rui Lim, Miriam Santiago Kimpo, Balamurugan A Vellayappan, Ai Peng Tan and Vincent Diong Weng Nga. The first draft of the manuscript was written by Shi Hui Ong and all authors reviewed and revised the manuscript accordingly. All authors read and approved the final manuscript.

Corresponding author

Correspondence to [Vincent Diong Weng Nga](#).

Ethics declarations

Conflict of interest

The authors declare no competing interests.

Additional information

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Rights and permissions

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.

[Reprints and permissions](#)

About this article

Cite this article

Ong, S.H., Lim, M.J.R., Tan, C.L. *et al.* Rare regression of congenital brainstem high-grade glioma: case report and literature review. *Childs Nerv Syst* **41**, 94 (2025). <https://doi.org/10.1007/s00381-024-06658-4>

Received

17 July 2024

Accepted

17 November 2024

Published

24 January 2025

DOI

<https://doi.org/10.1007/s00381-024-06658-4>

Keywords

[Brainstem High Grade Glioma](#)

[Tumor regression](#)

[Congenital Gliomas](#)