Spinal cord ependymoma

see also Spinal ependymoma MYCN-amplified

Epidemiology

Intramedullary ependymoma is a rare neoplasms, comprising approximately 5% of all CNS tumors and 15% of all spinal cord tumors.

Ependymomas are the most frequent spinal cord tumors in adult patients.

Some authors believe it is more common in the fourth and fifth decade while others propose a wider distribution spanning between the second and sixth decade of life 1 2 3 4 5

In a population-based survey of 467 patients with primary intraspinal neoplasms, intramedullary ependymomas accounted for 34.5% of all ependymomas of the central nervous system. According to the same study, the age-adjusted incidence rate for the primary intraspinal neoplasm is 0.5 in females and 0.3 in males per 100,000 population per year ⁶.

Spinal ependymomas commonly present as intramedullary tumors in the cervical or thoracic cord or as tumors arising from the conus medullaris or the filum terminale

Sometimes the tumor is located outside of the spinal cord and affects the cauda equina nerve roots.

Classification

Spinal ependymoma classification.

Dissemination

Spinal cord ependymomas presenting with regional dissemination along the neuroaxis are rare, with a yet undetermined standard of care.

Diagnosis

Spinal ependymoma diagnosis.

Differential diagnosis

Spinal cord ependymoma differential diagnosis

Treatment

see Spinal ependymoma treatment.

Complications

Despite their usually well-defined dissection plane, surgical morbidity has been documented to be considerably higher compared with other intramedullary entities.

Although surgery was once reserved for diagnosis alone, the evolution of surgical practices has elevated resection to the treatment of choice for these lesions. While technological advances continue to improve the capacity for gross-total resections and thus decrease the risk of recurrence, ependymoma spinal surgery still contains a variety of potential complications. The presence of neurological deficits and deterioration are not uncommonly associated with spinal cord ependymoma surgery, including sensory loss, dorsal column dysfunction, dysesthetic syndrome, and bowel and bladder dysfunction, particularly in the immediate postoperative period. Surgical treatment may also lead to wound complications and CSF leaks, with increased risk when radiotherapy has been involved. Radiation therapy may also predispose patients to radiation myelopathy and ultimately result in neurological damage. Additionally, resections of spinal ependymomas have been associated with postoperative spinal instability and deformities, particularly in the pediatric population. Despite the advances in microsurgical techniques and intraoperative cord monitoring modalities, there remain a number of serious complications related to the treatment of spinal ependymoma tumors. Identification and acknowledgment of these potential problems may assist in their prevention, early detection, and increased quality of life for patients afflicted with this disease⁷⁰.

Outcome

see Intramedullary ependymoma outcome.

There have been anecdotal reports of radiographic response of spinal ependymomas in neurofibromatosis type 2 (NF2) patients being treated for progressive vestibular schwannomas with bevacizumab.

Neurofibromatosis 1 (NF1) and ependymoma

Ependymoma with Neurofibromatosis type 1 (NF1) has rarely been reported. To date, only four cases have been reported in English literature

Case series

see Spinal cord ependymoma case series.

Case reports

Spinal cord ependymoma case reports.

Spinal ependymoma MYCN-amplified

Adult spinal ependymoma presents a rare low-grade tumor entity. Due to its incidence peak in the fourth decade of life, it mostly affects patients during a professionally and physically active time of life. We performed a retrospective monocentric study, including all patients operated upon for spinal ependymoma between 2009 and 2020. We prospectively collected data on professional reintegration, physical activities, and quality-of-life parameters using EQ-5D and SF-36. Issues encountered were assessed using existing spinal cord-specific questionnaires and free-text questions. In total, 65 of 114 patients agreed to participate. Most patients suffered from only mild pre-and postoperative impairment on the modified McCormick scale, but 67% confirmed difficulties performing physical activities in which they previously engaged due to pain, coordination problems, and fear of injuries after a median follow-up of 5.4 years. We observed a shift from full- to part-time employment and patients unable to work, independently from tumor dignity, age, and neurological function. Despite its benign nature and occurrence of formal only mild neurological deficits, patients described severe difficulties returning to their preoperative physical activity and profession. Clinical scores such as the McCormick grade and muscle strength may not reflect the entire self-perceived impairment appropriately ⁸.

Treatment

Fluorescein application⁹⁾.

Arima et al. first showed that quantitative analysis of ICG-VA may predict functional outcomes after spinal intramedullary ependymoma resection ¹⁰.

Sodium fluorescein aids in total excision of intramedullary spinal cord ependymoma and intraoperative residual tumor tissue identification. At the 3-month follow-up, the patients' functional outcome in the fluorescein group was good ¹¹.

It increases the gross-total resection rate in cases with contrast-enhanced tumors ¹²).

Further research is necessary to explore fluorescein sodium applications in the resection of spinal cord lesions $^{13)}$

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Traveras JM, Ferrucci J. Radiology. Diagnosis-Imaging-Intervention. Neuroradiology and radiology of the head and neck. Lippincott. 1994;3(110):1-12.

Rawlings CE, Giangaspero F, Burger PC, Bullard DE. Ependymomas: a clinicopathologic study. Surg Neurol. 1988;29:271–81.

Choi JY, Chang KH, Yu IK, Kim KH, Kwon BJ, Han MH, Kim IO. Intracranial and spinal ependymomas : review of MR Images in 61 patients. Korean J Radiol. 2002;3:219–28.

Asazuma T, Toyama Y, Suzuki N, Fujimura Y, Hirabayshi K. Ependymomas of the spinal cord and cauda equina : an analysis of 26 cases and a review of the literature. Spinal Cord. 1999;37:753-9.

Schwartz TH, McCormick PC. Intramedullary ependymomas : clinical presentation, surgical treatment strategies and prognosis. J Neurooncol. 2000;47:211–8.

Helseth A, Mørk SJ. Primary intraspinal neoplasms in Norway, 1955–1986, a population-based survey of 467 patients. J Neurosurg. 1989;71:842–5.

Nagasawa DT, Smith ZA, Cremer N, Fong C, Lu DC, Yang I. Complications associated with the treatment for spinal ependymomas. Neurosurg Focus. 2011 Oct;31(4):E13. doi: 10.3171/2011.7.FOCUS11158. Review. PubMed PMID: 21961857.

Butenschoen VM, Gloßner T, Hostettler IC, Meyer B, Wostrack M. Quality of life and return to work and sports after spinal ependymoma resection. Sci Rep. 2022 Mar 23;12(1):4926. doi: 10.1038/s41598-022-09036-9. PMID: 35322104.

Sant'Anna LS, Sepúlvida R, Abbud R, Leal RTM, Acioly MA. Fluorescein application in spinal ependymomas: have we come so far? Neurosurg Rev. 2022 May 31. doi: 10.1007/s10143-022-01821-4. Epub ahead of print. PMID: 35641841.

Arima H, Naito K, Yamagata T, Kawahara S, Ohata K, Takami T. Quantitative Analysis of Near-Infrared Indocyanine Green Videoangiography for Predicting Functional Outcomes After Spinal Intramedullary Ependymoma Resection. Oper Neurosurg (Hagerstown). 2019 Nov 1;17(5):531-539. doi: 10.1093/ons/opz040. PMID: 30888018.

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Sun Z, Yuan D, Sun Y, Guo Y, Wang G, Zhang P, Wang J, Shi W, Wang G. Intraoperative application of yellow fluorescence in resection of intramedullary spinal canal ependymoma. J Int Med Res. 2022 Mar;50(3):3000605221082889. doi: 10.1177/03000605221082889. PMID: 35313772; PMCID: PMC8943562.

Sun Z, Jing L, Fan Y, Zhang H, Chen L, Wang G, Sharma HS, Wang J. Fluorescein-guided surgery for spinal gliomas: Analysis of 220 consecutive cases. Int Rev Neurobiol. 2020;151:139-154. doi: 10.1016/bs.irn.2020.03.004. Epub 2020 May 13. PMID: 32448604.

Ung TH, Serva S, Chatain GP, Witt JP, Finn M. Application of sodium fluorescein for spinal cord lesions: intraoperative localization for tissue biopsy and surgical resection. Neurosurg Rev. 2022 Apr;45(2):1563-1569. doi: 10.1007/s10143-021-01676-1. Epub 2021 Oct 27. PMID: 34708272. Permanent link: https://neurosurgerywiki.com/wiki/doku.php?id=spinal_cord_ependymoma



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