Cerebellar pilocytic astrocytoma

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Key concepts

● Often cystic, half of these have a mural nodule.

● Usually presents during the second decade of life (ages 10–20 yrs).

● A subtype of pilocytic astrocytoma. Formerly referred to by the nonspecific and confusing term cystic cerebellar astrocytoma.

Epidemiology

Cerebellar pilocytic astrocytoma epidemiology.

Classification

Children

see Cerebellar pilocytic astrocytoma in children.

Adult

Cerebellar pilocytic astrocytomas in adults should be treated with macroscopic complete surgical

resection whenever possible. If this is achieved, long-term survival rates are excellent, whereas subtotal resection carries a high risk of tumor recurrence. Ki67 is less important prognostically than the extent of initial resection [1].

Clinical features

In the posterior fossa tumors, there is predominantly a mass effect with signs of raised intracranial pressure, especially when hydrocephalus is present. Bulbar palsy or cerebellar syndrome may also be present.

Diagnosis

Cerebellar pilocytic astrocytoma diagnosis.

Differential diagnosis

Cerebellar pilocytic astrocytoma differential diagnosis.

Treatment

see Cerebellar pilocytic astrocytoma treatment.

Outcome

Nine percent of the children in a study underwent repeated surgery due to progressive tumor recurrence, and 15% were treated for persistent hydrocephalus [2].

The long-term functional outcome of low-grade cerebellar astrocytoma is generally favourable, in the absence of post-operative complications and brainstem involvement. No major impact of neurological deficits, cognitive functions and emotional disorders on academic achievement and independent functioning was observed [3].

The good long-term outcomes suggest that it may be appropriate to do incomplete resection rather than risk additional neurological deficit [4].

There is controversy about whether patients with tumor remaining after surgery should receive radiation therapy. It is also unclear whether only patients with incomplete resection require follow-up and for how long [5].

Complications

Acute hemorrhagic presentation in pilocytic astrocytomas (PAs) has become increasingly recognized. This type of presentation poses a clinically emergent situation in those hemorrhages arising in PAs of the cerebellum, the most frequent site, because of the limited capacity of the posterior fossa to compensate for mass effect, predisposing to rapid neurological deterioration.

Complete resection

Complete resection of cerebellar astrocytoma is an important prognostic factor, indicating a more favorable prognosis than subtotal resection. This was also the conclusion of a much larger study by Villarejo et al. who reviewed 203 cases of low-grade cerebellar astrocytoma [6].

Loh et al., documented that patients with subtotal removal of cerebellar astrocytoma can have arrested tumor growth or spontaneous tumor regression during long-term follow-up. Following partial resection of pediatric cerebellar astrocytoma, they recommend that the patients be followed up a “wait and see” approach with surveillance using MRI. They found that several tumors treated with radiotherapy after surgery had malignant transformation and do not recommend adjuvant radiation treatment for children with cerebellar astrocytoma who have subtotal resection. More research is needed on the prognosis of patients with subtotal resection of cerebellar astrocytoma [7].

Pilomyxoid features and anaplasia

A subset may behave in a more aggressive fashion and clinically progress despite the use of conventional treatments. Histologic features associated with a more aggressive course include the presence of monomorphous pilomyxoid features (ie, pilomyxoid variant) and anaplasia in the form of brisk mitotic activity with or without necrosis [8].

Case series

Cerebellar pilocytic astrocytoma case series.

Case reports

Cerebellar pilocytic astrocytoma case reports.

References

1)
Wade A, Hayhurst C, Amato-Watkins A, Lammie A, Leach P. Cerebellar pilocytic astrocytoma in adults: a management paradigm for a rare tumour. Acta Neurochir (Wien). 2013 Aug;155(8):1431-5. doi: 10.1007/s00701-013-1790-1. Epub 2013 Jun 22. PubMed PMID: 23793962.
2)

Due-Tønnessen BJ, Lundar T, Egge A, Scheie D. Neurosurgical treatment of low-grade cerebellar astrocytoma in children and adolescents: a single consecutive institutional series of 100 patients. J Neurosurg Pediatr. 2013 Mar;11(3):245-9. doi: 10.3171/2012.11.PEDS12265. Epub 2012 Dec 14. PubMed PMID: 23240848.

3) Ait Khelifa-Gallois N, Laroussinie F, Puget S, Sainte-Rose C, Dellatolas G. Long-term functional outcome of patients with cerebellar pilocytic astrocytoma surgically treated in childhood. Brain Inj. 2014 Nov 10:1-8. [Epub ahead of print] PubMed PMID: 25383654.

4) Steinbok P, Mangat JS, Kerr JM, Sargent M, Suryaningtyas W, Singhal A, Cochrane D. Neurological morbidity of surgical resection of pediatric cerebellar astrocytomas. Childs Nerv Syst. 2013 Aug;29(8):1269-75. doi: 10.1007/s00381-013-2171-z. Epub 2013 May 29. PubMed PMID: 23715810.

5) Dirven CM, Mooij JJ, Molenaar WM. Cerebellar pilocytic astrocytoma: a treatment protocol based upon analysis of 73 cases and a review of the literature. Childs Nerv Syst. 1997;13:17–23. doi: 10.1007/s003810050033.

6) Villarejo F, Diego JMB, Riva AG. Prognosis of cerebellar astrocytoma in children. Childs Nerv Syst. 2008;24:203–210. doi: 10.1007/s00381-007-0449-8.

7) Loh JK, Lieu AS, Chai CY, Hwang SL, Kwan AL, Wang CJ, Howng SL. Arrested growth and spontaneous tumor regression of partially resected low-grade cerebellar astrocytomas in children. Childs Nerv Syst. 2013 Nov;29(11):2051-5. doi: 10.1007/s00381-013-2113-9. Epub 2013 May 1. PubMed PMID: 23632690; PubMed Central PMCID: PMC3825417.

8) Rodriguez FJ, Scheithauer BW, Burger PC, Jenkins S, Giannini C. Anaplasia in pilocytic astrocytoma predicts aggressive behavior. Am J Surg Pathol. 2010;34(2):147–160.