

Incidental cerebellar dermoid cyst mimicking low grade glioma in a teenager

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DESCRIPTION

A 16-year-old boy with no significant medical history or family history sustained a concussion after an altercation. CT revealed an incidental finding of a heavily mineralised left inferior paramedian cerebellar lesion demonstrating cystic components (figure 1A). MRI revealed minimal peripheral enhancement and no evidence of reduced diffusivity (figure 1B–C). Differential diagnosis included juvenile pilocytic astrocytoma, postinfectious or postinflammatory process, cavernoma or other vascular malformations with encephalomalacia. Although the patient did not have any symptoms prior to the trauma, after the incident he started having frequent headaches, dizziness, trouble concentrating and anxiety. He denied any visual problems, back pain or any problems with gait or balance. Physical examination was significant for slightly slowed bilateral rapid alternating movements without dysmetria or tremor. Due to symptom onset coinciding with trauma, the patient was treated at a concussion clinic and was prescribed symptomatic treatment for his headaches. The headaches did not improve after 3 months of therapy and an MRI was repeated that showed a stable lesion. Due to the lack of symptomatic improvement, the patient and family wanted to proceed with surgery as opposed to observation where a gross total resection of the posterior fossa mass was achieved. Tissue pathology (figure 2) showed a cystic space lined by squamous epithelium with abundant calcifications, several fragments of embedded hair material, numerous cholesterol clefts, giant cells and hemosiderin-laden macrophages. Adjacent cerebellar tissue with gliosis, including Rosenthal fibres, was identified. These findings were most consistent with a diagnosis of a dermoid cyst. The patient's symptoms resolved several months following surgical resection.

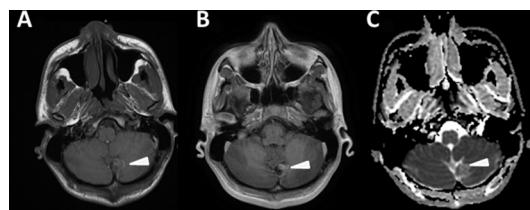


Figure 1 Neuroimaging findings of cerebellar dermoid cyst. CT revealed an incidental finding of a heavily mineralised left inferior paramedian cerebellar lesion demonstrating cystic components (A). MRI revealed minimal peripheral enhancement and no evidence of reduced diffusivity (B–C).

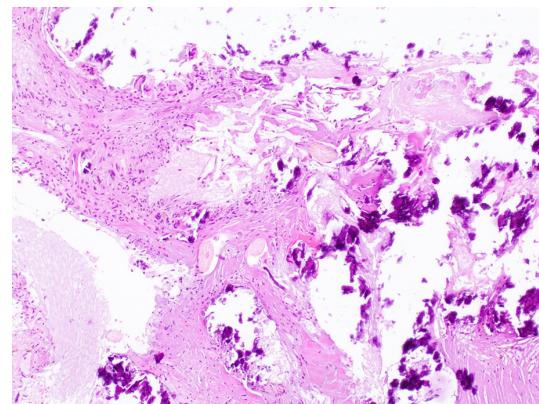


Figure 2 Histological features of cerebellar dermoid cyst. Neuropathology showed a cystic space lined by squamous epithelium. Much of the cyst wall epithelium was denuded and replaced with foreign body giant cell reaction with abundant calcifications. Numerous cholesterol clefts, giant cells and hemosiderin-laden macrophages were identified. There are multiple foci of basophilic calcifications, some of which are undergoing ossification. Several fragments of hair material are embedded within and adjacent to the cyst. Adjacent cerebellar tissue has gliosis, including Rosenthal fibres.

Intracranial dermoid cysts are extremely rare and congenital benign tumours encompassing less than 1% of all intracranial tumours.¹ As they arise from ectodermal committed cells, histologically, dermoid cysts are lined by stratified squamous epithelial cells and may contain calcifications, sebaceous and sweat glands' secretions, desquamated epithelium and hair follicles. They most frequently occur in the posterior fossa and are typically present with mass effect symptoms. MRI usually shows T1 hyperintensity due to the fat content and variable signal on T2. Contrastingly to dermoid cysts, calcifications in pilocytic astrocytoma are uncommon.²

Rupture of intracranial dermoid cysts has been reported after closed head injury.³ Large ruptures

Learning points

- ▶ Intracranial dermoid cysts are extremely rare benign tumours that should be included in the differential diagnosis of calcified posterior fossa masses.
- ▶ Intracranial dermoid cysts may be symptomatic, especially in cases of rupture.
- ▶ Neuroimaging features of intracranial dermoid cysts may have similarities of low grade glioma.



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produce MRI findings with high-intensity signal on T1-weighted images. An analysis of 44 adult cases found that the most common symptoms associated with ruptured dermoid cysts are headaches (31.8%), seizure (29.5%) and temporary sensorimotor symptoms (15.9%). Headaches were experienced more often in younger adult patients in association with dermoid cysts.⁴ Recurrence rates depend on the degree of resection (total vs near-total), a study of 33 patients with intracranial dermoid and epidermoid tumours found a recurrence rate of 9% in gross total resection (n=3).⁵

Our case highlights that intracranial dermoid cysts may mimic findings of cystic calcified low grade glioma on neuroimaging and should be included in the differential diagnosis of calcified posterior fossa tumours.

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REFERENCES

- El-Bahy K, Kotb A, Galal A, et al. Ruptured intracranial dermoid cysts. *Acta Neurochir* 2006;148:457–62.
- Chourmouzi D, Papadopoulou E, Konstantinidis M, et al. Manifestations of pilocytic astrocytoma: a pictorial review. *Insights Imaging* 2014;5:387–402.
- Phillips WE, Martinez CR, Cahill DW. Ruptured intracranial dermoid tumor secondary to closed head trauma. *J Neuroimaging* 1994;4:169–70.
- Stendel R, Pietilä TA, Lehmann K, et al. Ruptured intracranial dermoid cysts. *Surg Neurol* 2002;57:391–8.
- Lynch JC, Aversa A, Pereira C, et al. Surgical strategy for intracranial dermoid and epidermoid tumors: an experience with 33 patients. *Surg Neurol Int* 2014;5:163.

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