A rare case of bone marrow infiltration by medulloblastoma in a child

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Images in Haematology

A rare case of bone marrow infiltration by medulloblastoma in a child

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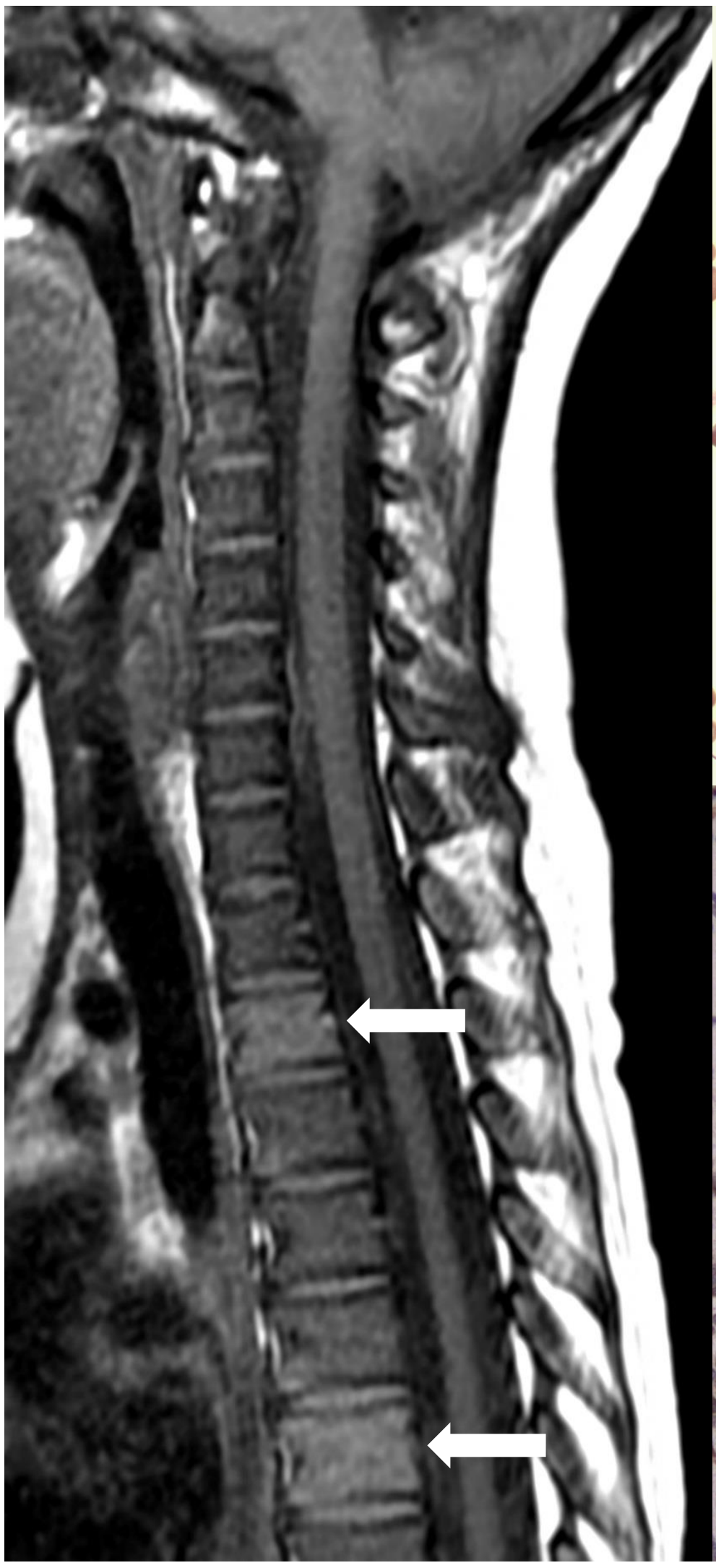
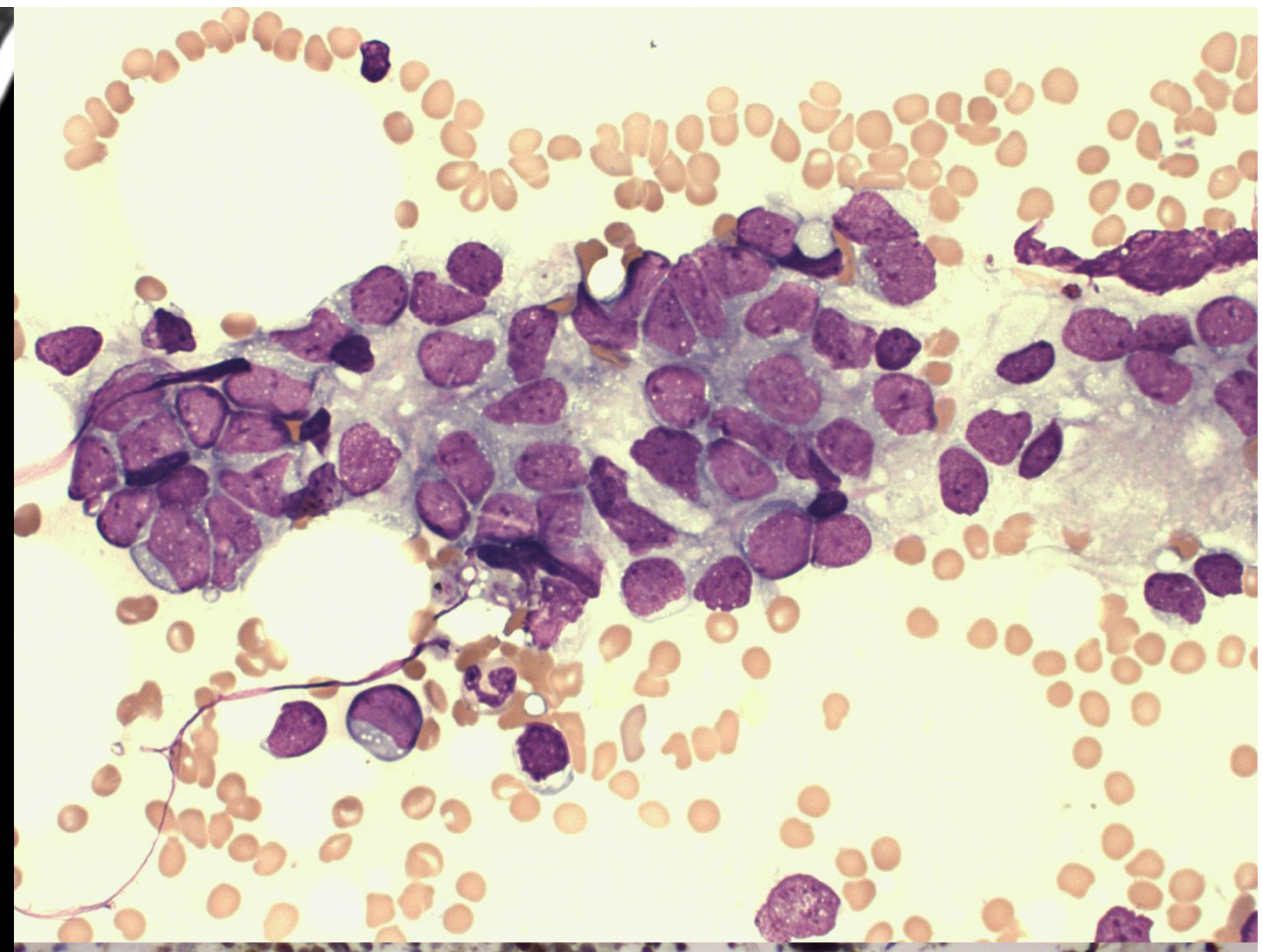
Article

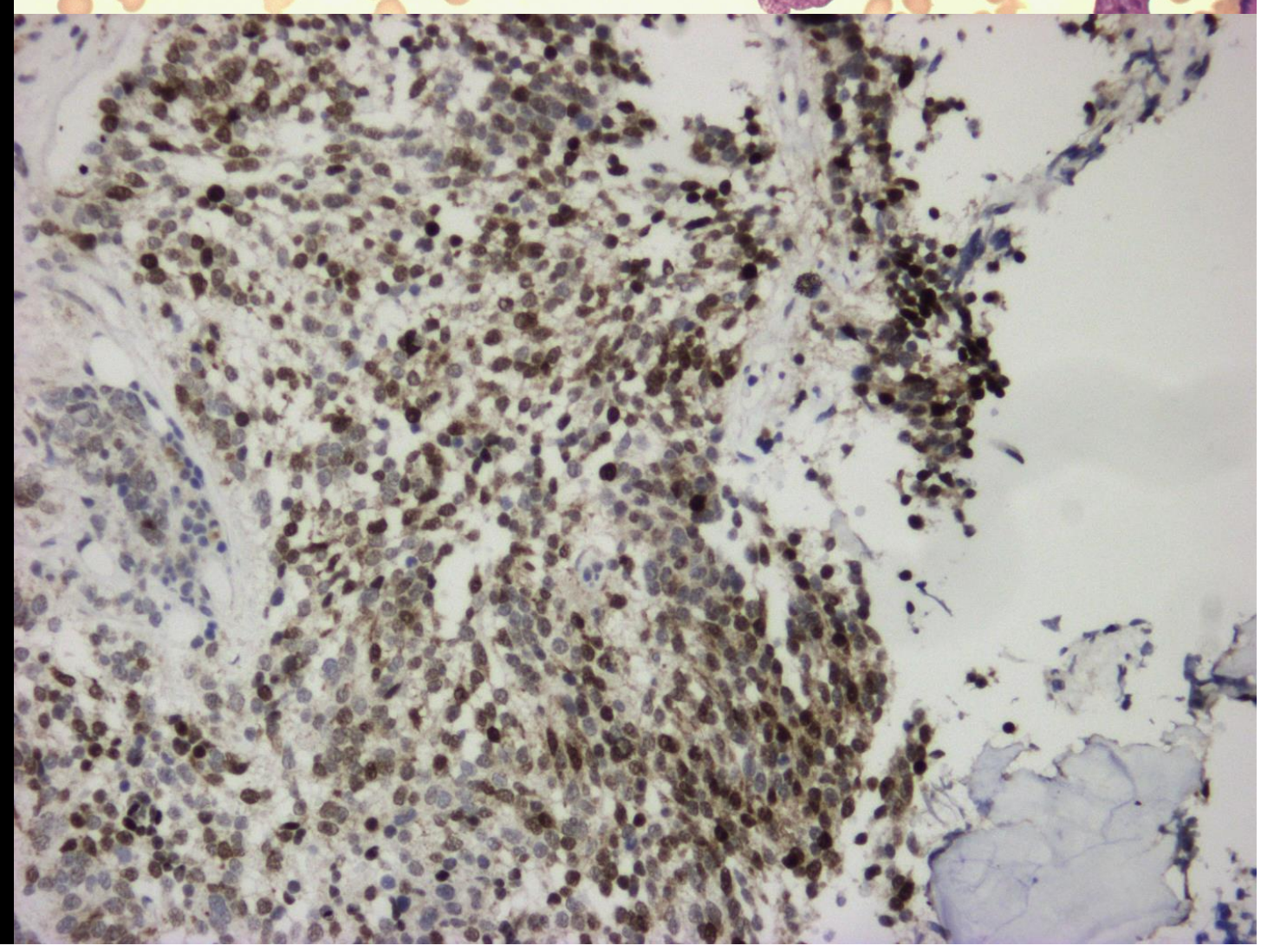
A seven-year-old boy had previously been treated for a posterior fossa medulloblastoma, with extensive central nervous system metastases. At initial presentation a chemotherapy approach was preferred, due to both his young age and extent of disease; this achieved complete radiological and cytological remission prior to consolidation with high-dose chemotherapy and autologous stem cell rescue. He then experienced an asymptomatic localised posterior fossa relapse on surveillance imaging, treated by complete surgical resection, craniospinal irradiation and maintenance chemotherapy. Unfortunately, end-of-treatment magnetic resonance imaging (MRI) of the neuro-axis revealed an asymptomatic new small enhancing intracranial lesion. Repeat MRI performed six weeks later showed minor progression of the intracranial disease and no intrathecal metastases, but new low T1 signals in multiple vertebral bodies with sparing of T3 and T7 vertebrae (arrows; left image). A full blood count showed Hb 97 g/l, WBC 7.7 $\times 10^9$/l, neutrophils 5.4 $\times 10^9$/l and platelets 204 $\times 10^9$/l. In view of the radiological appearances, bone marrow aspiration and trephine biopsy were performed from the posterior iliac crest. The aspirate revealed heavy infiltration with clusters of non-haematopoietic cells, characterized by high nuclear:cytoplasmic ratio, open chromatin and agranular, weakly basophilic cytoplasm with vacuolation (right upper image). Trephine biopsy immunohistochemistry demonstrated positive staining for synaptophysin, CD56, Neu-N (right lower image), retained INI1 expression and negative CD99 and desmin, confirming medulloblastoma. Spread of medulloblastoma to the bone marrow is a very rare event. In this case, despite an unremarkable full blood count, radiological changes in the spinal column suggesting widespread marrow infiltration were confirmed by bone marrow examination. Early identification of extracranial metastasis afforded the family and clinicians the opportunity to make informed choices regarding ongoing management.

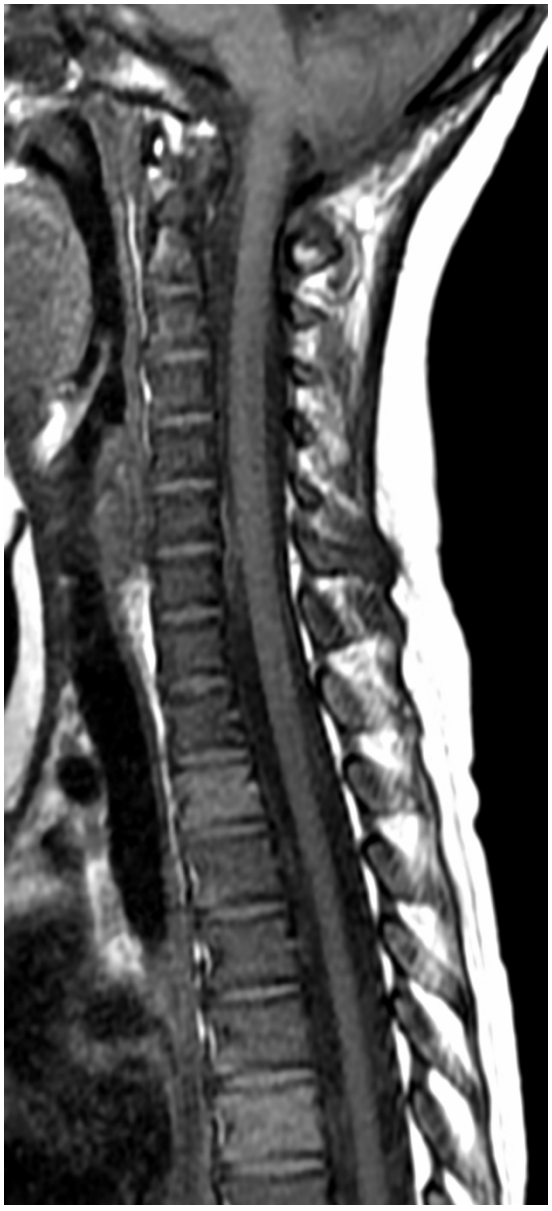
Acknowledgements

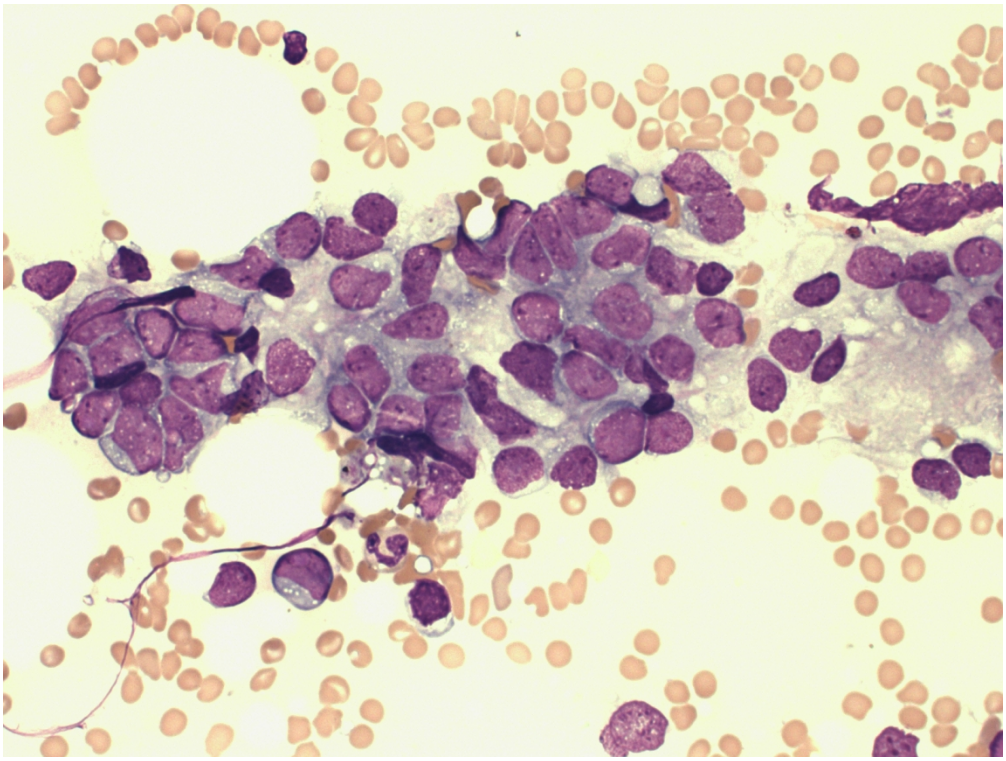
Specific contributions to the work described in the manuscript: AS and ED reported the bone marrow aspirate, obtained images, contributed to the manuscript and agreed the final version. CEH and KA reported the bone marrow trephine and obtained images, contributed to the manuscript and agreed the final version. TM reported the MRI spine and obtained images, contributed to the manuscript and agreed the final version. MJM was the clinician responsible for patient care, coordinated the work, wrote the manuscript and agreed the final version.

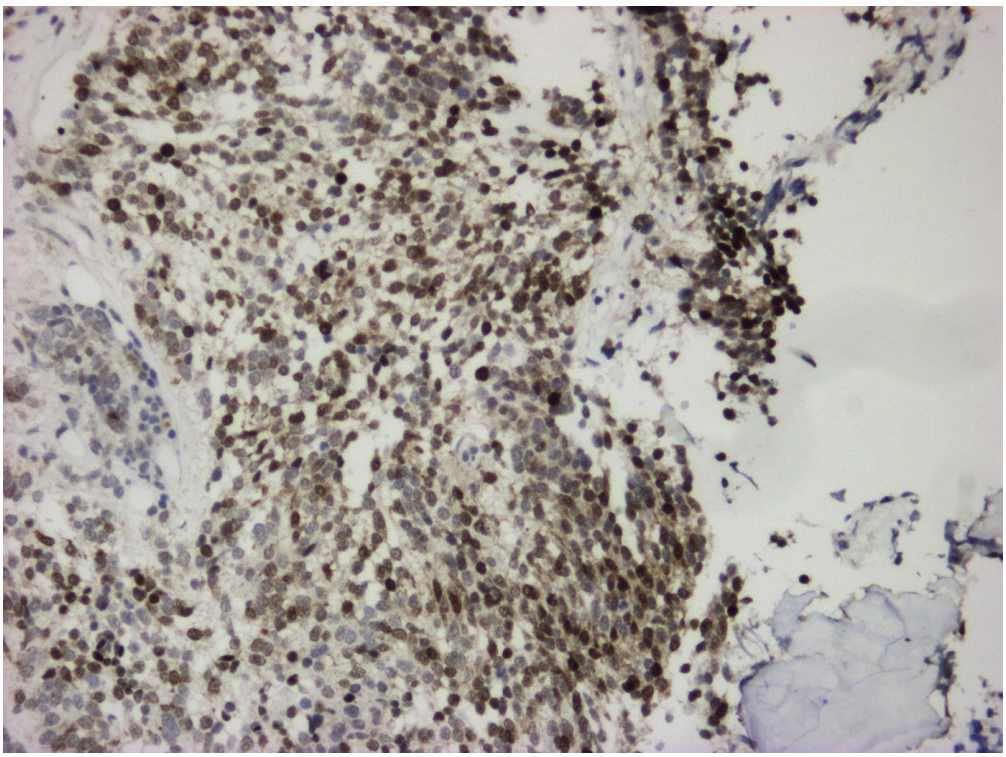












368x275mm (96 x 96 DPI)

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Article

A seven-year-old boy had ~~was~~ previously been treated for ~~the primary~~a posterior fossa ~~tumour,~~ medulloblastoma, with extensive central nervous system metastases ~~including leptomeningeal and intrathecal spinal disease; methylation profiling confirmed a Group 4 tumour~~. At initial presentation a chemotherapy approach was preferred, due to both his young age and extent of disease; this achieved complete radiological and cytological remission prior to consolidation with high-dose chemotherapy and autologous stem cell rescue. He then experienced an asymptomatic localised posterior fossa relapse on surveillance imaging, treated by~~with~~ complete surgical resection, craniospinal irradiation and maintenance chemotherapy. ~~This chemotherapy was interrupted due to poor count recovery following irradiation, and a bone marrow aspirate and trephine were performed which excluded metastatic medulloblastoma or secondary leukaemia. Alternative maintenance with temozolomide was well tolerated.~~ Unfortunately, end-of-treatment magnetic resonance imaging (MRI) ~~imaging~~ of the neuro-axis revealed an asymptomatic new small enhancing intracranial lesion. R~~An early r~~epeat MRI ~~was~~ performed six weeks later ~~which~~ showed minor progression of the intracranial disease and no intrathecal metastases, but new low T1 signals in multiple vertebral bodies with sparing of T3 and T7 vertebrae (arrows; left image) ~~compared with the imaging performed just six weeks previously~~. A f~~F~~ull blood count show~~reveal~~ed Hb 97 g/l, WB~~C~~C 7.7 ×~~x~~10^9/l, neutrophils 5.4 ~~x~~×10^9/l and platelets 204 ~~x~~×10^9/l. In view of the radiological appearances, bone marrow aspiration~~e~~ and trephine biopsy were performed from the posterior iliac crest. The a~~A~~spirate revealed heavy infiltration with clusters of non-haematopoietic cells, characterized by high nuclear:cytoplasmic ratio, open chromatin and agranular, weakly~~pale~~ basophilic cytoplasm with vacuolation (right upper image). Trephine biopsy immunohistochemistry demonstrated positive staining for synaptophysin, CD56, Neu-N (right lower image), retained INI1 expression and negative CD99 and desmin, confirming medulloblastoma. Spread of

medulloblastoma to the bone marrow is a very rare event. In this case, despite an unremarkable full blood count, radiological changes in the spinal column ~~correlated with easily identified disease in aspirate and trephine samples taken from the posterior iliac crest~~ suggesting widespread marrow infiltration were confirmed by bone marrow examination. Early identification of extracranial metastasis afforded the family and clinicians the opportunity to make informed choices regarding ongoing management.

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