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CASE REPORT

Colorectal cancer bone metastasis compressing the sagittal sinus

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Introduction

A 66-year-old man with a long history of metastatic colorectal cancer presented with a new mass on his skull. This was diagnosed as a bone metastasis with subsequent compression of the sagittal sinus.

Case report

A 60-year-old Caucasian man was diagnosed with invasive rectal adenocarcinoma 6 years ago. At that time he was staged as having a T3a N1 M0 low rectal tumour. He had no significant comorbidities and a World Health Organization (WHO) performance status of zero. The patient chose not to pursue surgical management of his disease as he did not want a permanent stoma. He was treated with a long course of chemoradiotherapy followed by an internal radiotherapy boost to the primary tumour delivered with Papillon contact radiotherapy. He had a complete radiological response to treatment and at that point had no evidence of metastatic disease.

Two years after his initial diagnosis he was found to have locally recurrent disease in the rectum requiring surgery with abdominoperineal resection. The tumour was resected with clear margins. Two years later he was found to have three large liver metastases that were deemed to be borderline resectable and he was offered chemotherapy to try and downsize the lesions. However, after four cycles of oxaliplatin and capecitabine, the metastases showed only a slight response and were not amenable to surgery. Management was therefore no longer curative and he was started on a palliative chemotherapy regimen of irinotecan, 5-fluorouracil and panitumumab.

After five cycles the patient was admitted with abdominal pain and vomiting. A computed tomography scan at that time showed small bowel obstruction as a result of adhesions and revealed progressive disease in his liver, even though his tumour marker carcinogenic embryonic antigen (CEA) levels had remained low.

Around this time, an asymptomatic small lump was noted on the back of his head. On examination there was a 1.5 cm wide by 1 cm high raised hard lump. It did not have the classical appearances of a subcutaneous nodule as it was firm and non-mobile, but was still thought to be suspicious of possible metastatic involvement. No imaging was arranged at that point as he was asymptomatic and was starting third-line chemotherapy which potentially would have treated all sites of metastases.

Shortly after the first cycle of third-line chemotherapy the patient was admitted with headache associated with photophobia, lethargy and nausea. There was no focal neurology on examination and the patient had a normal Glasgow coma scale score.

A magnetic resonance imaging scan of the brain showed a 2 cm wide destructive mass in the midline centred on the occipital bone, which had intra- and extracranial components (Figures 1 and 2). The intracranial component produced significant mass effect on the adjacent posterior portion of the superior sagittal sinus. There was no definite invasion of the sinus and no evidence of thrombosis, but signal within the sinus suggested slow venous flow. Magnetic resonance venography was performed which showed a tight focal stenosis of the superior sagittal sinus just above the torcula as a result of extrinsic compression; however, the sinus appeared to remain patent (Figure 3).

The patient's symptoms responded well to high-dose steroid therapy. The case was discussed in a neuro-surgical multidisciplinary team meeting where it was felt surgery would not be suitable and that stereotactic radiosurgery would have a high risk of necrosis of the skin because of the lesion's location. He received 20 Gy in five fractions of palliative radiotherapy to the posterior skull which he tolerated well. He remained at home for 2 months until the disease progressed further and he subsequently died.

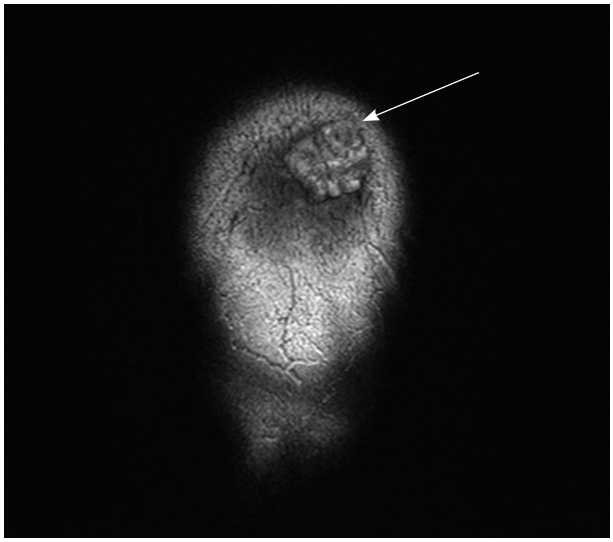

Figure 1. Magnetic resonance imaging showing metastasis within occipital bone (arrow), T2 coronal view.

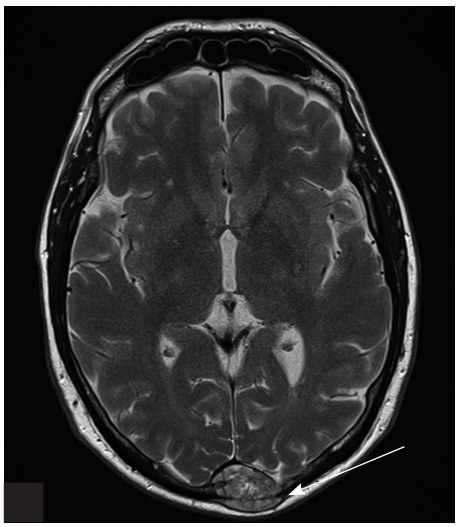

Figure 2. Magnetic resonance imaging of the head showing intra- and extracranial components of metastasis with mass effect (arrow), T2 transverse view.

Figure 3. Magnetic resonance venography time of flight coronal view showing tight focal stenosis of the superior sagittal sinus (arrow).

Discussion

Colorectal cancer is the fourth most common cancer in the UK with 42 000 new cases diagnosed per year (Cancer Research UK, 2020). Up to 50% of patients will develop metastatic disease at some point in their illness; the commonest sites are the liver and lungs. Bone metastases can occur, although these tend to be a late occurrence, most commonly 18–20 months after diagnosis, and are usually preceded by lung and liver metastases. Solitary bone metastases are very rare (1–2% of patients) (Kanthan et al, 1999).

Improvements in systemic treatments for metastatic colorectal cancer have led to an increase in overall survival, with median overall survival up to 36 months in some studies (Heinemann et al, 2014). The natural history of the disease has also changed and more bone metastases are now being seen as a result of patients living longer.

There is a higher rate of bone metastases from rectal cancer than colon cancer (Assi et al, 2016) and bone metastases are usually more common in those with multiple metastases, those who have received multiple lines of treatment and those surviving a long time from diagnosis (Roth et al, 2009).

Learning points

- Bone metastases can occur in patients with colorectal cancer.
- They usually occur later in the disease history and usually in the presence of widespread metastatic disease.
- Good palliative care input is crucial.

There have been a few reports in the literature of metastases compressing the sagittal sinus (Iqbal and Sharma, 2013), but there appears to be no particular anatomical reason that metastases should concentrate here and may just reflect that metastases elsewhere in the skull are less likely to become symptomatic.

Survival after bone metastases is poor (approximately 5 months), particularly if associated with visceral disease. Managing patients' symptoms is crucial and should include analgesia, consideration of steroids, local radiotherapy and good palliative care input. Surgery may be considered if the patient has limited visceral disease, but in the majority of patients this is not the case.

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