Cancer Imaging (2003) **3,** 71–74
DOI: 10.1102/1470-7330.2003.0001

CI

e-med
www.e-med.org.uk

CASE REPORT

An unusual complication of prostatic bony metastases

S A Barnard*, G McGann†, H G Gilbert‡ and S Elyan§

**Department of Clinical Radiology, Bristol Royal Infirmary, Bristol, UK; Departments of †Radiology, ‡Urology and §Oncology, Cheltenham General Hospital, Cheltenham, UK*

Corresponding address: S A Barnard, Department of Clinical Radiology Bristol Royal Infirmary Bristol UK
E-mail: stuart@barnard.net

Date accepted for publication 5 November 2002

Abstract

Carcinoma of the prostate is a common condition and often spreads to bone. We describe the imaging findings in two patients with known carcinoma of the prostate who presented with visual disturbance (both had papilloedema on examination). MRI showed occipital bone metastases and superior sagittal sinus thrombosis. We suggest that MRI is the imaging modality of choice in patients suffering from prostate cancer who have visual disturbance and that MRV sequences should be included to detect venous sinus thrombosis.

Keywords: *Prostate; bone; metastases; sinus; thrombosis; visual disturbance.*

Introduction

Carcinoma of the prostate is a common condition, with over 21 000 cases and over 10 000 deaths every year in the United Kingdom alone[1]. The disease often spreads to bone. We describe two patients with known carcinoma of the prostate who presented with visual disturbance and papilloedema on examination. Imaging showed occipital bone metastases and superior sagittal sinus thrombosis.

Case 1

The first patient was a 76-year-old gentleman who presented to the urology service complaining of a poor stream. His prostate specific antigen (PSA) at the time of presentation was 14 μg/l. He underwent transurethral resection of the prostate, which yielded benign histology. He re-presented to the urology service 30 months later with a serum PSA of 378 μg/l with macroscopic haematuria. Rectal examination revealed an irregular firm prostate. A trans-rectal biopsy of the prostate was performed and poorly differentiated adenocarcinoma of the prostate was diagnosed. The patient was commenced on cyproterone acetate. Later that month the patient complained of deteriorating vision. Ophthalmic examination was performed. The patient had normal visual acuity but marked visual field loss and bilateral papilloedema. An MRI scan was performed, which showed bony metastases in the occipital bone and oedema in the cerebellum (Figs 1 and 2). The slightly hyper-intense signal in the superior sagittal sinus indicates that the thrombosis is between 5 and 15 days old and is due to the presence of methaemoglobin[2]. The patient responded well to 20 Gy (in five fractions) of radiotherapy, delivered to the occipital region. The patient made a symptomatic improvement and remains on hormonal treatment.

Case 2

The second patient was a 62-year-old gentleman who was admitted to hospital with a history of recent onset of headaches, nausea, nocturia and macroscopic haematuria. His general practitioner had measured his PSA, which was 371 μg/l. Positive findings on examination included bilateral papilloedema and a markedly ataxic gait with cerebellar ataxia.

Isotope bone scanning showed bony metastases in the thoracolumbar spine, the pelvis and the base of the

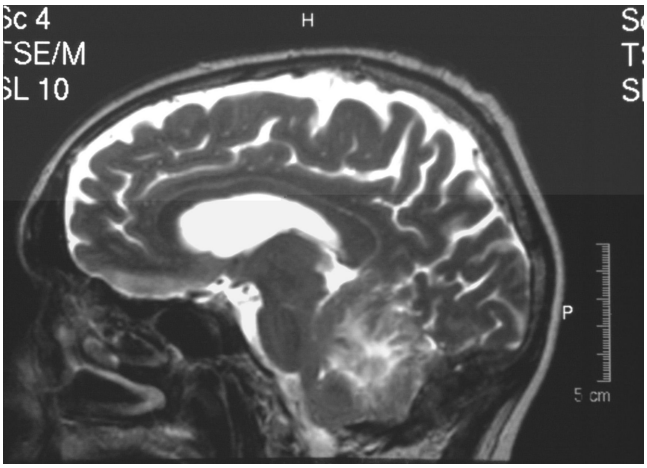

Figure 1 **T2W sagittal image of patient 1, showing metastases in the occipital bone and oedema of the cerebellum.**

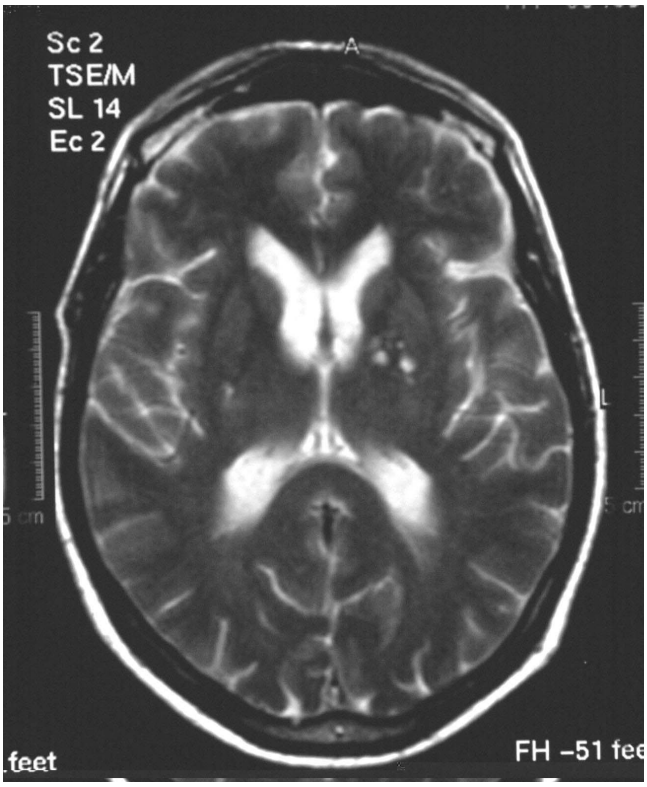

Figure 2 **T2W axial image of patient 1, showing mixed signal in the sagittal sinus compatible with thrombosis. After treatment of the metastases with radiotherapy, follow-up imaging showed a return of a normal signal void.**

Figure 3 **T2W axial image of patient 2, showing metastases in the occipital bone and iso-intense signal in the occluded sagittal sinus. Note the fluid around both optic nerves.**

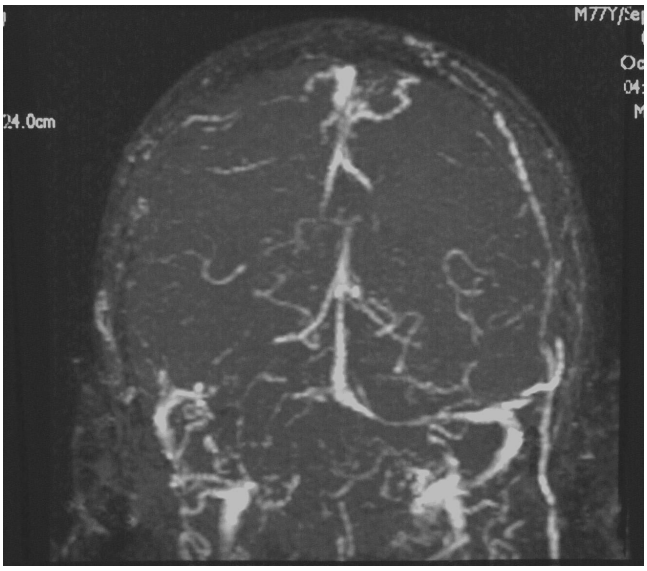

Figure 4 **MRV (2D TOF) of patient 2 showing thrombus in the superior sagittal sinus.**

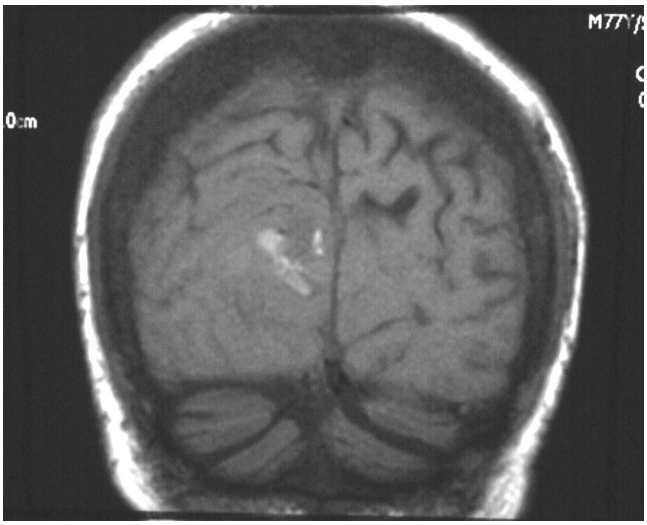

Figure 5 **Coronal T1W image of patient 2 demonstrating high signal adjacent to the superior sagittal sinus compatible with haemorrhage.**

skull. Computed tomography (CT) of the brain did not demonstrate cerebral metastases but MRI scanning did reveal bony metastases in the occiput (Fig. 3) and superior sagittal sinus thrombosis (Fig. 4). Venous infarcts in the occipital lobes adjacent to the superior sagittal sinus were also demonstrated (Fig. 5).

The patient was commenced on cyproterone acetate and received 30 Gy to the skull in 10 fractions over 14 days. He showed a good response to treatment.

Discussion

Bony metastases are common in prostate carcinoma. Papilloedema has been described in prostate carcinoma due to transverse sinus thrombosis, but this was a result of dural metastases at the torcula[3] and not in the bone of the skull vault. Bony metastases in the optic canal have also been described, causing painless visual loss[4].

Bony metastases may respond well to radiotherapy and hormonal treatment. MRI is effective at showing both bony metastases in carcinoma of the prostate[5] and is the imaging modality of choice for cerebral venous sinus thrombosis[6]. Intravenous contrast-enhanced CT scanning may show filling defects in the superior sagittal sinus, but MRI is more sensitive in the detection of superior sagittal thrombosis and venous oedema and of bone metastases. MRI does not suffer from the bone artefacts in the posterior fossa.

We would suggest that in a patient with visual disturbance, who is known to be suffering from a malignancy that may spread to bone, MRI is the imaging modality of choice and the venous sinuses should be examined with MRV at the time of imaging.

References

[1] GLOBOCAN 2000. Cancer incidence, mortality and prevalence worldwide: version 1.0. IARC. CancerBase No. 5. Lyon: IARCPress, 2001.

[2] Provenzale JM, Joseph GJ, Barboriak DP. Dural sinus thrombosis: findings on CT and MR imaging and diagnostic pitfalls. Am J Roentgenol 1998; 170: 777–83.

[3] Kim AW, Trobe JD. Syndrome simulating pseudotumor cerebri caused by partial transverse venous sinus obstruction in metastatic prostate cancer. Am J Ophthalmol 2000; 129: 254–6.

[4] Kattah JC, Chrousos GC, Roberts J, Kolsky M, Zimmerman L, Manz H. Metastatic prostate cancer to the optic canal. Ophthalmology 1993; 100: 1711–5.

[5] Traill ZC, Talbot D, Golding S, Gleeson FV. Magnetic resonance imaging versus radionuclide scintigraphy in screening for bone metastases. Clin Radiol 1999; 54: 448–51.

[6] Bianchi D, Maeder P, Bogousslavsky J, Schnyder P, Meuli RA. Diagnosis of cerebral venous thrombosis with routine magnetic resonance: an update. Eur Neurol 1998; 40: 179–90.