SKELETAL METASTASIS IN PRIMARY CARCINOMA OF THE LIVER*

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SUMMARY

Two cases of hepatoma metastasizing to bone are reported. Attention is drawn to the fact that although skeletal metastasis in hepatoma is uncommon, it may be the initial presentation of the tumour.

Primary carcinoma of the liver is the commonest form of malignancy encountered in the Bantu male in South Africa.[1] This tumour is also very common in the Bantu in Mozambique where it has the highest known incidence in the world.[2]

Skeletal metastasis in primary carcinoma of the liver is relatively rare. Its importance lies in the fact that it may be the initial presentation in a patient in whom the primary tumour is symptomless. A skeletal metastasis may also simulate a primary bone tumour. The commonest sites of skeletal metastasis are the thoracic and the lumbar vertebrae. The ribs and the long bones of the limbs are less commonly involved.

We have recently seen a patient with skeletal metastasis from a hepatoma in the Orthopaedic Unit at King Edward VIII Hospital, Durban. A search of the hospital records from January 1966 to September 1970 produced one further case of hepatoma with skeletal metastasis, proved at autopsy. It must be pointed out, however, that this probably does not reflect the true incidence of skeletal metastasis in liver carcinoma. For a variety of reasons only about 50% of all patients who die at King Edward VIII Hospital come to autopsy. Furthermore, a detailed examination of the skeletal system is not made in all autopsies.

CASE REPORTS

Case 1

A 22-year-old Zulu male was admitted to the Orthopaedic Unit in 1970 with a 7-month history of low back

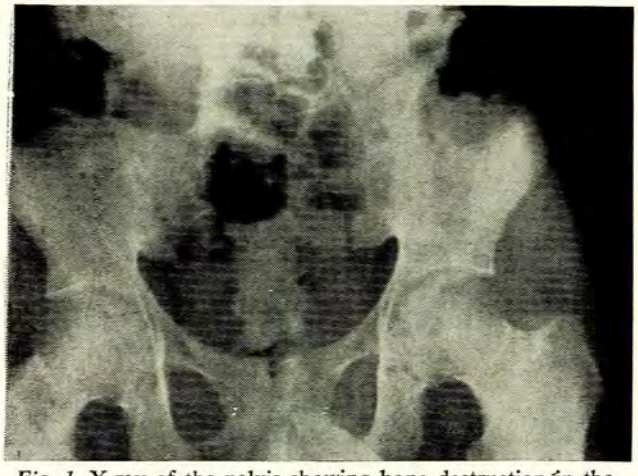

Fig. 1. X-ray of the pelvis showing bone destruction in the left ala of the sacrum and in the adjoining ilium.

*Date received: 7 January 1971.

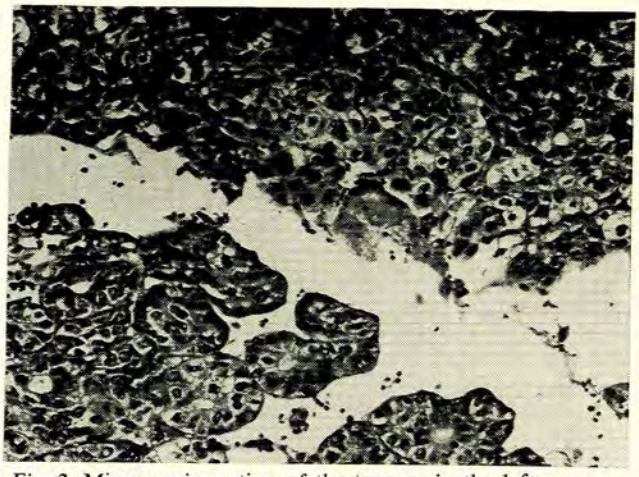

Fig. 2. Microscopic section of the tumour in the left sacro-iliac joint region. A trabecular pattern of metastatic tumour is seen.

Fig. 3. Macroscopic section of the liver of case 1 showing tumour nodules and cirrhosis.

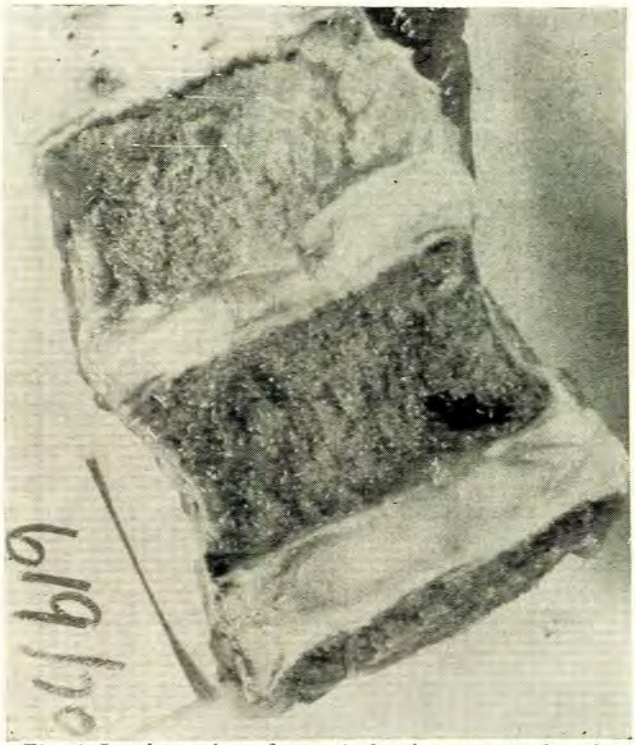

Fig. 4. Lumbar spine of case 1 showing tumour deposits in the fourth and fifth lumbar vertebrae.

Fig. 5. Microscopic section of liver taken at autopsy. A tumour nodule is seen in the top left-hand and bottom right-hand corners. The nodules did not contain iron on special staining. The intervening liver is cirrhotic.

pain. The pain radiated down the back of his left leg to the toes. He had had several previous haematemeses. On examination his liver was enlarged to 4 fingerbreadths below the costal margin and the spleen was just palpable. He was tender to percussion over the spinous process of the fourth and fifth lumbar vertebrae. The muscles of the left thigh and calf were wasted. Sensation to pinprick and light touch over the fourth and fifth lumbar dermatomes on the left sides was impaired. X-ray of the pelvis and lower lumbar spine (Fig. 1) showed a destruction of the left ala of the sacrum and of the adjacent portion of the ilium. X-ray of the chest showed no abnormality. A biopsy specimen was obtained through the retroperitoneal route.

At operation a brownish tumour growing over the surface of the left ilium, posteriorally, was found. Histology of the tumour showed a metastatic carcinoma with a trabecular pattern. Brownish pigment resembling bile was found. The features were strongly suggestive of hepatoma (Fig. 2).

Following operation the patient had several further haematemeses and died. At autopsy the liver was found

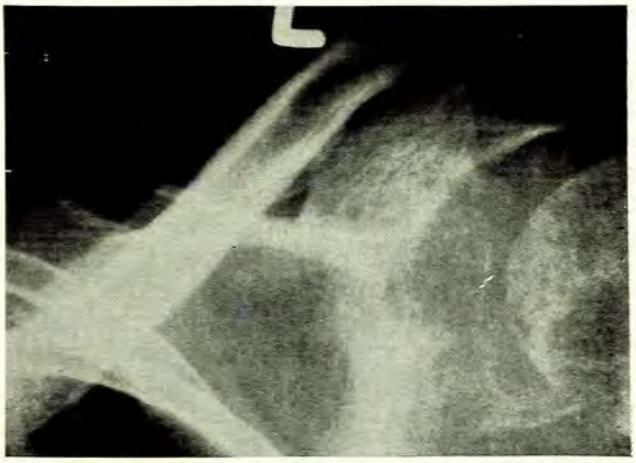

Fig. 6. X-ray of the left shoulder showing destruction of bone in glenoid and in the head of the humerus.

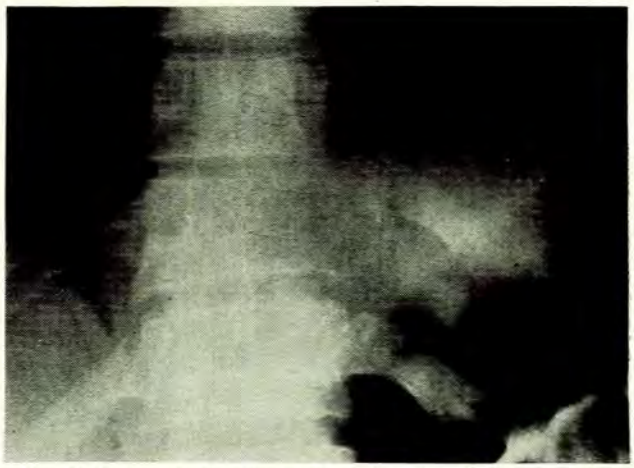

Fig. 7. X-ray of the lower thoracic spine showing partial destruction of the body of the eleventh thoracic vertebra.

to contain numerous tumour nodules scattered throughout the substance. These were pale coloured and of variable size (Fig. 3). There was destruction of bone in the left sacro-iliac region consistent with metastasia. Metastatic deposits were also present in the bodies of the fourth and fifth lumbar vertebrae (Fig. 4). There was no macroscopic evidence of metastases to the lungs or other organs.

Fig. 8. Destructive changes can be seen in both pubic rami.

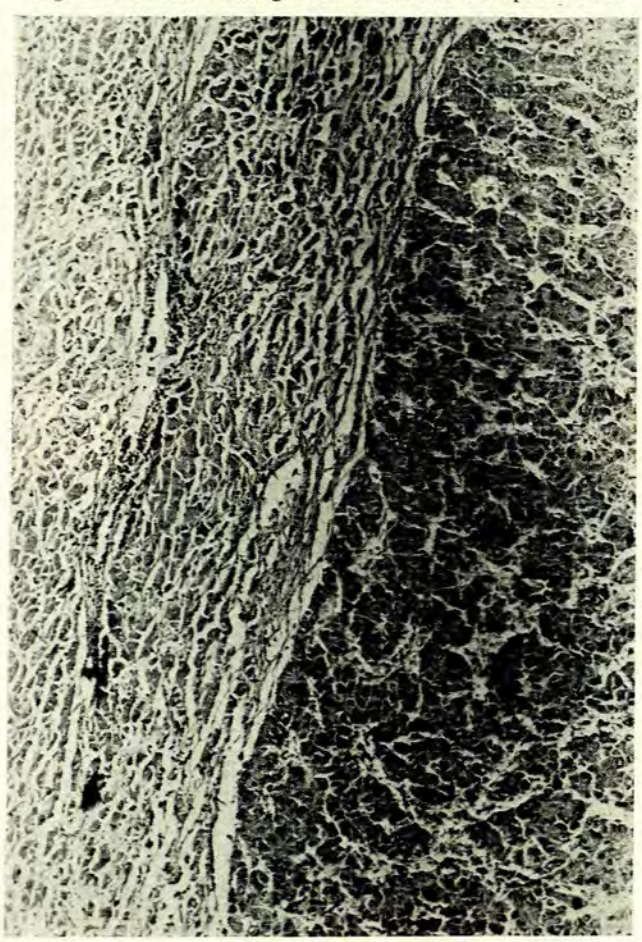

Fig. 9. Section from the liver showing tumour on the left side of the picture and compressed liver tissue on the right.

Histology of the tumour showed a bile-secreting hepatoma. Cirrhosis was present (Fig. 5).

Case 2

A 60-year-old Zulu male was admitted in 1967 with pain and swelling of the left shoulder region, low back pain, paraparesis and swelling of the feet. He stated that his symptoms had commenced 1 month before admission. The recorded physical findings were incomplete but he was found to be a cachectic individual. He had paraparesis and bed sores.

X-ray examination showed destructive changes at the proximal end of the left humerus and in the adjacent glenoid fossa (Fig. 6). There was partial destruction of the body of the eleventh thoracic vertebra and of the left third rib (Fig. 7). Destructive changes were present in both pubic rami (Fig. 8).

At autopsy multicentric carcinoma of the liver was found (Fig. 9). Tumour deposits were present in both the glenoid and the head of the left humerus (Fig. 10). A metastasis was present in the body of the eleventh thoracic vertebra. There was evidence of septicaemia in that bacterial colonies were found in sections from the heart, lungs, liver and kidneys. The humeral head and the body of the eleventh thoracic vertebra showed the presence of osteo-

Fig. 10. Microscopic section of the glenoid taken at autopsy. Metastatic tumour is seen in the lower half of the picture while evidence of osteomyelitis is seen in the top half.

myelitis in addition to being the site of tumour metastasis.

DISCUSSION

Primary carcinoma of the liver may arise either from the liver parenchyma (hepatoma) or from the duct system (cholangioma). Mixed forms occur.[3] Metastasis to the skeleton is said to be more frequent in the hepatoma than in the cholangioma.[4] Skeletal metastasis in both types of primary liver carcinoma is very uncommon. Charache[5] reviewed the world literature up to 1939 and found 18 cases.

Bile may be secreted by skeletal metastases in a hepatoma. This occurred in case 1. Berman[1] lists the vertebrae, ribs, sternum, skull bones, pelvis, humerus and femur as sites of bony metastasis. Neumann[6] reported a patient in whom many bones were involved. Spinal metastases usually present as backache, sciatica and with clinical features of cord compression. A pathological fracture of a long bone such as humerus[7] or femur[8,9] may occasionally be the initial presentation.

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REFERENCES

1. Berman, C. (1951): *Primary Carcinoma of the Liver*. London: H. K. Lewis.
2. Silva, M. and Manso, C. (1970): S. Afr. Med. J., **44**, 1123.
3. Parker, J., Dahlin, D. and Stauffer, M. (1970): Proc. Mayo Clin. **45**, 25.
4. Rosenberg, D. and Ochsner, A. (1948): Surgery, **24**, 1036.
5. Charache, H. (1939): Amer. J. Surg., **43**, 96.
6. Neumann, M. (1944): Amer. J. Path., **20**, 895.
7. Surtek, K. and Vos, J. (1951): *Op. cit.*[3]
8. Moon, V. (1929): Arch. Path., **8**, 938.
9. Bolker, H., Jacobi, M. and Koven, M. T. (1937): Arch. Intern. Med., **10**, 1212.