Skeletal Radiol (1984) 12:192–195

Skeletal Radiology

The Value of Computed Tomography in Osseous Hydatid Disease (Echinococcosis)

A. Bouras, M.D.[1], D. Lardé, M.D.[1], D. Mathieu, M.D.[1], G. Delépine, M.D.[2], C. Benameur, M.D.[1], and J. Ferrané, M.D.[1]

[1] Department of Radiology, and [2] Department of Orthopaedic Surgery, Henri Mondor Hospital, F-94010 Creteil, France

Abstract. The authors report three cases of osseous hydatid disease (echinococcosis) in which examination by computed tomography (CT) was found to be helpful in establishing the diagnosis. Recognition of this rare bone infection in orthodox radiographs is notoriously difficult, but is aided by knowledge of the patient having lived in an area in which the disease is endemic. In two instances, one involving the shoulder and the other the thoracic spine, radiological abnormalities had been attributed at first to tuberculosis. In the third case, in which a destructive lesion in the sacrum had been interpreted correctly, CT studies provided confirmation of a recurrence.

CT has proved to be an effective and sensitive method of demonstrating these destructive lesions in bone, of determining their spread, and of establishing the presence of other hydatid cysts in adjacent soft tissues. This technique has been found to be of value in preoperative planning of the surgical approach to hydatid lesions of the skeleton.

Key words: Osseous hydatid disease – Echinococcosis – Computed tomography – Soft tissues

In spite of recent progress in the immunological diagnosis and medical treatment of hydatid disease [5], its osseous lesions pose two different problems. Difficulty arises in diagnosis, since this localisation is rare (0.5 to 5%) [1, 2], and serodiagnosis is unreliable in cases of bone involvement. At the therapeutic level the behaviour of skeletal lesions is comparable to that of a malignant tumour [1, 2]. Precise determination of their extent, a preoperative essential prior to performing a single stage excision, is often difficult with conventional radiographic techniques. This report assesses the value of supplementary investigation by computed tomodensitometric examinations in three cases of osseous localisations of hydatid disease.

Address reprint requests to: A. Bouras, M.D., Department of Radiology, Henri Mondor Hospital, F-94010 Creteil, France

Case Reports

Case 1

A 29-year-old male Algerian consulted on account of pain in the right shoulder, which was stiff and swollen. This state of affairs had existed and progressed for several years. Clinical examination revealed the presence of a mobile mass in the external region of the delto-pectoral furrow.

Plain films demonstrated a loculated lytic lesion in the head and neck of the humerus, extending into the metadiaphyseal area and causing endosteal erosion of the cortex (Fig. 1). This radiological appearance aroused suspicion of a primary neoplasm. A further lytic lesion, however, was identified in the upper portion of the glenoid. This abnormality, coupled with narrowing of the gleno-humeral joint space, suggested a tuberculous infection. The mobile anterior mass was punctured and from it several millilitres of a highly viscous yellowish liquid were aspirated. Bacteriological examination for *M. tuberculosis* was negative, as was also immunoelectrophoresis and immunofluorescence in search of a parasitic aetiology.

Computed tomography (CT) examination (Fig. 2) confirmed osteolysis of the head of the humerus and spread of the lesion into the diaphysis. Gross destruction of the anterior cortex was clearly evident, together with the sharply defined glenoid lesion and narrowing of the gleno-humeral joint. More interestingly, CT revealed several rounded cysts (density: 10 HU) in the muscle masses (Fig. 3). One cyst originated in the humeral head and extended distally in the bicipital groove, while another, 4 cm in diameter, lay in the infraspinous fossa.

The existence of these cysts in association with the osteolytic lesions, coupled with the geographical origin of the patient from an endemic area, suggested osseous involvement by hydatid disease. Curettage and puncture of the cysts was performed and the diagnosis was confirmed by postoperative pathological examination. Further immunological studies then were found to be positive.

Case 2

This 49-year-old Algerian man had been treated for two years with antibiotics and surgical drainage for spinal tuberculosis

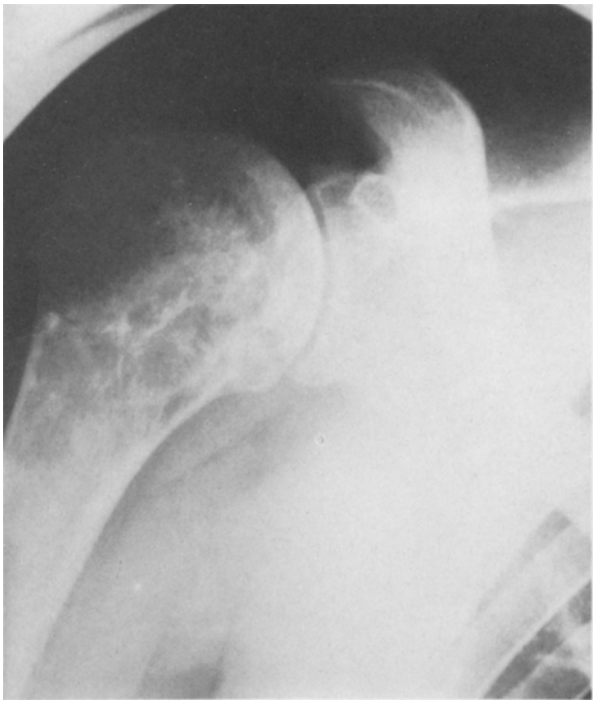

Fig. 1. *Case 1.* Right shoulder: loculated lytic lesion of head and neck of humerus, extending into metaphysis with endosteal cortical erosion. The glenohumeral joint space is narrow and another lytic lesion is present in the upper portion of the glenoid

at the T5/6 level. No bacteriological proof of this diagnosis had been obtained. He was admitted to our institution on account of a recurrent left paramedian abscess and complete paraplegia. The reflexes of the abdominal skin and lower limbs were absent and general anaesthesia existed below T9. A film of the chest showed a rounded opacity superimposed on the aortic knuckle and a lytic lesion of the 6th left posterior costal arch.

Frontal and profile tomograms of the thoracic spine (Fig. 4) revealed a clearly defined lytic lesion in the body of T6. The left side of this body was expanded, being demarcated by a slender bony shell. The left pedicle and the posterior portion of the left 6th rib had undergone similar destruction. A paravertebral soft tissue swelling was evident. The intervertebral disc spaces at the T5/6 and T6/7 levels, however, were normal. These findings were considered to eliminate the diagnosis of vertebral tuberculosis. The involvement of two adjacent bones caused a number of diagnostic possibilities to be considered, but the geographical origin of the patient and the length of history caused hydatid disease to be favoured. CT studies then were undertaken. These studies (Figs. 5 and 6) established not only extensive destruction of the body and left pedicle of T6 and the posterior portion of the left 6th rib, but revealed also similar involvement of the body of T5. The paraspinal soft tissue mass on the left side was due to large cysts. One had displaced the aorta forwards and others involved the posterior muscles. The spinal cord appeared to be unaffected.

These findings strongly supported the diagnosis of osseous hydatid disease. Immunological reactions, however, although slightly positive, remained inconclusive. The diagnosis was confirmed at operation. By a left lateral approach, laminectomy of T5 and 6 and resection of the involved rib were performed. The lesions in the vertebral bodies were curetted and the cysts

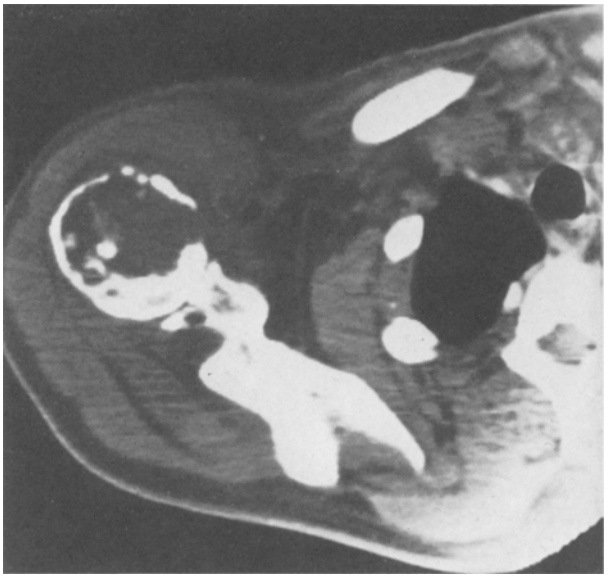

Fig. 2. *Case 1.* Right shoulder: CT shows extensive cortical destruction of the anterior side of the humerus, narrowing of the glenohumeral joint space, and the lytic lesion in the glenoid

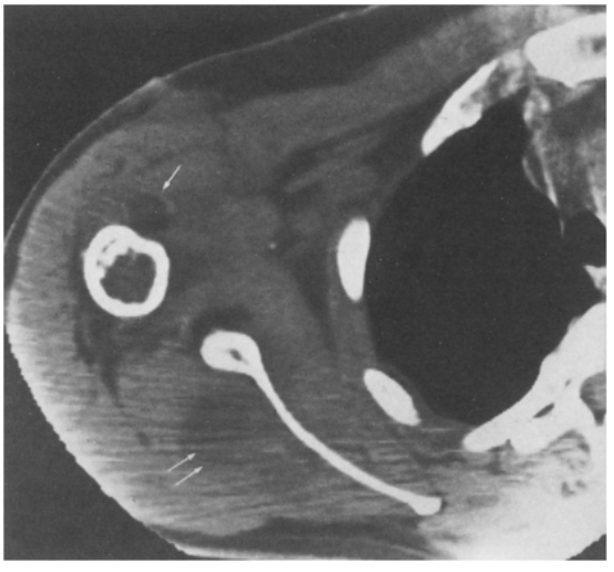

Fig. 3. *Case 1.* Right shoulder: this more distal CT scan shows several round cysts ($d=10$ HU) in the muscles. One cyst (*arrow*) in the bicipital groove originated from the humeral head; another (*double arrow*) was located in the infraspinous fossa

were excised, with the exception of the anterior wall of that in contact with the descending aorta.

Case 3

This 43-year-old Italian man presented in April 1978 with a cauda equina syndrome and progressively increasing S1 left sciatica. Myelography at that time had suggested an intrasacral tumour, but the preoperative diagnosis of hydatid disease was confirmed at operation. Laminectomy and deroofing of the sacral canal had been accompanied by evacuation of daughter

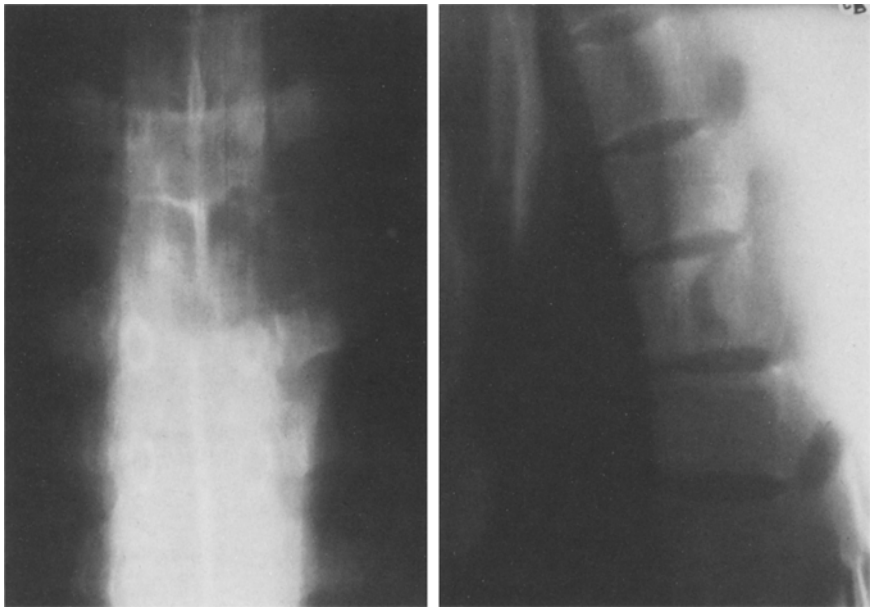

Fig. 4. *Case 2.* These tomograms show the expansive osteolytic lesion on the left side of the body of T6, destruction of the left pedicle, and an associated soft tissue mass

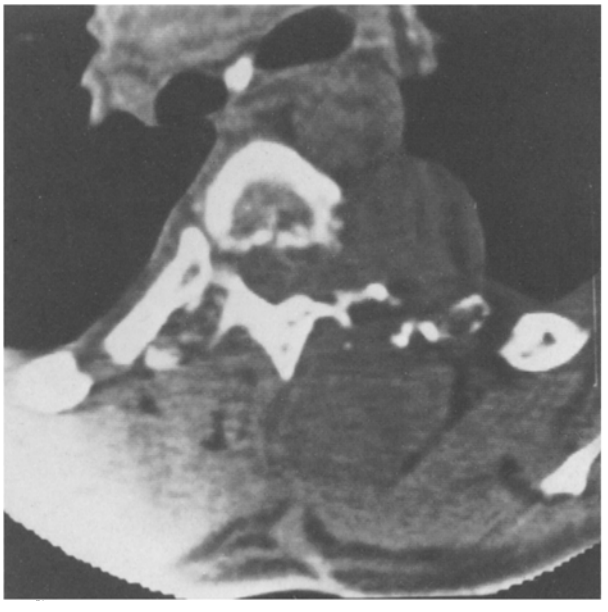

Fig. 5. *Case 2.* CT scan at the level of T5 shows osteolysis of the left side of this body, the left pedicle, and the posterior end of the rib. Large cysts are present both behind and in front, the latter in contact with the descending aorta

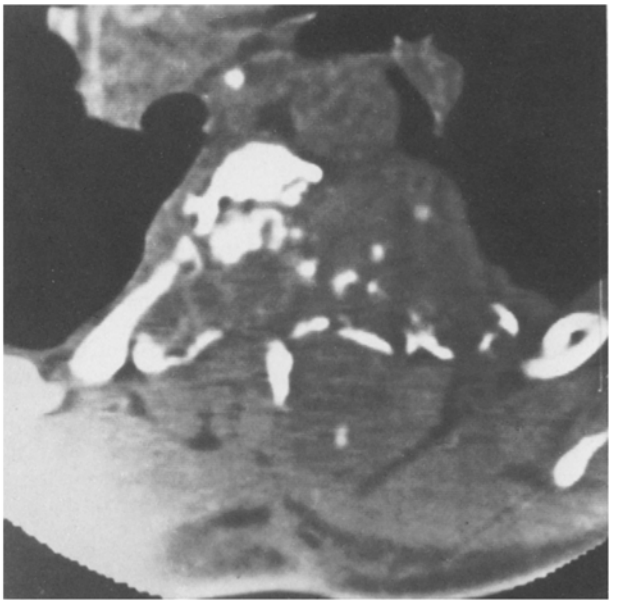

Fig. 6. *Case 2.* CT scan at the level of T6 shows even more severe destruction of the left side of this vertebral body and neural arch and the adjacent rib, corresponding to the tomograms in Fig. 4. The anterior cyst has caused anterior displacement of the descending aorta

vesicles and sterilisation with hypertonic saline. Immunofluorescence and immunoelectrophoresis reactions were positive.

Two years later this patient was admitted to hospital again with persistent sciatica and an abscess in the left buttock which had discharged spontaneously. At this time an obvious lytic lesion was evident in the left side of the sacrum. CT examination (Fig. 7) not only showed the former laminectomy, but confirmed the destructive lesions in the sacrum. In addition numerous cysts had displaced the dural sac forwards and had spread into the adjacent posterior soft tissues. The patient was treated with fluormebendazone (3 g/day). The immunofluorescent and immunoelectrophoretic reactions subsequently showed a slight tendency to become negative. A control CT, after seven months of treatment, indicated the lesions to have stabilised.

Discussion

Localisation of hydatid disease is usually visceral, the radiological and CT characteristics being well known, especially for hepatic [6] and cerebral [7]

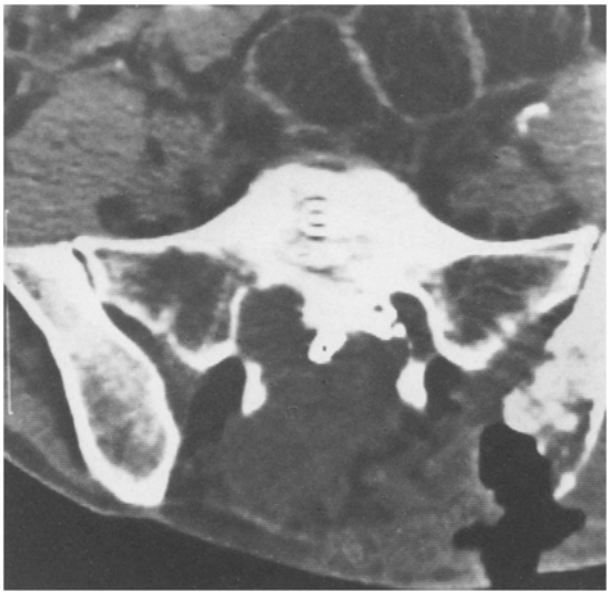

Fig. 7. *Case 3.* In this recurrent lesion numerous cysts were present in the lumbospinal soft tissues, having extending from the site of the previous laminectomy

sites. Bone involvement is rare, conventional films often being nonspecific. Lesions in soft tissues tend to be recognised only in advanced stages of the diseases. Two previous reports concerning study of spinal hydatid disease by CT have been published [3, 4], the authors stressing the advantage of CT over conventional radiology in the assessment of spread of intra- and perispinal lesions.

CT analysis of the bone lesions themselves in hydatid disease does not appear to contribute much more information than that obtained in orthodox films, but more accurate delineation of the areas of destruction does make interpretation easier, especially in the spine and hip, the most frequent sites to be affected. The primary contribution of CT is in the recognition of hydatid cysts within soft tissues. In the three cases reported, the round cystic formations in the soft tissues, with densities varying between 10 and 20 HU, did not take up intravenous contrast medium. Nevertheless, their presence did engender a strong suspicion of the correct diagnosis even when immunoelectrophoretic and immunofluorescent tests were negative (Case 1) or inconclusive (Case 2) before surgery.

The cases described illustrate the value of CT in management and its ability to furnish a precise preoperative status of spread of the lesions to the surgeon. In turn this information permits choice of the most suitable surgical approach which will provide the best chance of eradicating the lesion and causing the least mutilation. Such an approach should reduce the particularly high risk of recurrence which exists in this disease. In Case 1 the cyst in the infraspinous fossa would, at best, have been poorly recognised without CT. In Case 2 accurate definition of the osseous localisation and the involvement of soft tissues led to the choice of surgical approach. Finally, in Case 3 CT confirmed the recurrence, defined the degree of invasion of the lumbosacral soft tissues, and demonstrated extension of bone involvement. In this case medical treatment was preferred to further surgical intervention.

Conclusion

We believe that our results confirm the contribution of CT in assessing osseous manifestations of hydatid disease, both from the diagnostic and therapeutic aspects. Despite the relatively small size of the series CT, in our opinion, has an important and almost essential role to play in the diagnosis and management of these rare lesions. Its particular value lies in the demonstration of hydatid cysts, previously unsuspected, in soft tissues adjacent to areas of bone destruction.

References

1. Abelanet R, Forest M, Palangie A, Meary R, Tomeno B, Languepin A (1975) L'échinococcose osseuse: à propos de 6 observations anatomo-cliniques. Ann Anat Pathol 20:133
2. Bettaieb A, Khaldi M, Ben Rouma T, Touibi S (1978) L'échinococcose vertébro-médullaire. Neurochirurgie 24:205
3. Braithwaite PA, Lees RF (1981) Vertebral hydatid disease: Radiological assessment. Radiology 140:763
4. Giordano GB, Cerisoli M, Bernardi B (1982) Hydatid cysts of the spine. J Comput Assist Tomogr 6:408
5. Heath DD, Chevis RAF (1974) Mebendazole and hydatid cysts. Lancet 2:218
6. Kirschner LP, Ferris RA, Mero JH, Mortion LM (1978) Case report: Hydatid disease of the liver evaluated by computed tomography. J Comput Assist Tomogr 2:229
7. Ozgen T, Erbengi A, Bertan V, Saglam S, Guercay O, Pirnar T (1979) The use of computerized tomography in the diagnosis of cerebral hydatid cysts. J Neurosurg 50:339