after 10 years of follow up. This excess death rate is probably due to an increased incidence of other tumours and an excess of deaths from cardiac failure due to the effects of radiation on the myocardium.

The study in the United Kingdom is selecting women with completely excised lesions for randomisation. To give healthy women who have volunteered for screening a five week course of radiotherapy, with its associated short term morbidity and its potentially more serious effects after treatment, seems hard to justify. Surely the scientifically and ethically sound approach in this uncommon disorder is a careful appraisal of the excised tissue after surgery and then close observation of the patient. In this way the course of the disease will be learnt, groups at high risk of progression identified, and public confidence in the screening programme maintained.

1 Broders AC. Carcinoma in situ contrasted with benign penetrating epithelium. *JAMA* 1932;99:1670-4.

- 2 World Health Organisation. *Histological typing of breast tumours*. 2nd ed. Geneva: WHO, 1981.
- 3 Rosen PP, Servie R, Schottenfeld D, Ashikari R. Non-invasive breast cancer. Frequency of unsuspected invasion and implications for treatment. *Ann Surg* 1979;189:377-82.
- 4 Carter D, Smith RRL. Carcinoma in situ of the breast. *Cancer* 1977;40:1189-93.
- 5 Wanebo HJ, Huvois WD, Urban JA. Treatment of minimal breast cancer. *Cancer* 1974;33:349-57.
- 6 Page DL, Dupont WD, Roger L, Landenburger M. Intraductal carcinoma of the breast: follow up after biopsy only. *Cancer* 1982;49:751-8.
- 7 Rosner D. Non-invasive breast cancer. Results of a national survey by the American College of Surgeons. *Ann Surg* 1980;192:139-47.
- 8 Millis RR, Thynne GSJ. In situ intraduct carcinoma of the breast: a long term follow up study. *Br J Surg* 1975;62:957-62.
- 9 Fisher ER, Sass R, Fisher B, Wickerham L, Paik SM. Pathologic findings from the national surgical adjuvant breast project (protocol 6) 1. Intraductal carcinoma (DCIS). *Cancer* 1986;57:197-208.
- 10 Read PE, Ash DV, Thorogood J, Benson EA. Short term morbidity and cosmesis following lumpectomy and radical radiotherapy for operable breast cancer. *Clin Radiol* 1987;38:371-3.
- 11 Cuzick J, Stewart HJ, Peto R, et al. Overview of randomised trial of postoperative adjuvant radiotherapy in breast cancer. *Recent Results Cancer Res* 1988;111:105-29.
- 12 Haybittle JL, Brinkley D, Houghton J, A'Hearn RP, Baum M. Postoperative radiotherapy and late morbidity: evidence from the Cancer Research Campaign trial for early breast cancer. *Br Med J* 1989;298:1611-4.

(Accepted 2 May 1990)

Lesson of the Week

Fractures of long bones occurring in neonatal intensive therapy units

Rachel R Phillips, Stephen H Lee

To avoid fracturing long bones the utmost care must be used when handling premature infants during minimally invasive procedures

Highly specialised intensive care and technology enable extremely premature and low birthweight infants to survive. The utmost delicacy must be used when handling these infants because the slightest trauma may cause fractures. We report on two premature infants who had fractures of long bones after insertion of an intravenous catheter.

Case reports

Case 1—A girl weighing 690 g was born at 25 weeks' gestation. She developed severe hyaline membrane disease requiring prolonged assisted ventilation, which was started when she was 6 hours old. Her other problems included septicaemia, a patent ductus arteriosus, and hydrocephalus resulting from an intraventricular haemorrhage. She required a combination of parenteral and nasojunal feeding. Ten weeks after delivery an intravenous catheter was inserted into a peripheral vein in the dorsum of her left wrist. Swelling of soft tissue was noted subsequently, although the

FIG 2—Fractures of distal metaphysis and midshaft of left femur, with no radiological changes of metabolic bone disease of prematurity.

intravenous infusion was running normally. Radiography showed fractures of the distal metaphyses of the radius and ulna but no evidence of loss of bone density or thinning of the cortex (fig 1). The temporal relation between insertion of the catheter and the clinical and radiological evidence of the fractures indicated that they were traumatic in origin rather than a result of metabolic bone disease of prematurity. Before the fractures the serum alkaline phosphatase activity was normal and the serum phosphate concentration mildly raised at 1.69 mmol/l (normal range 0.8-1.4 mmol/l). The fractures were treated with immobilisation, and dietary supplements of calcium, phosphate, and vitamin D were continued. Satisfactory healing occurred without sequelae.

Case 2—A boy weighing 980 g was born at 29 weeks' gestation. He required assisted ventilation for hyaline membrane disease and persistent ductus arteriosus. He was fed through a nasojunal tube and was given an intravenous infusion. On the fifth day after delivery the intravenous infusion was sited into a vein in the

Department of Imaging,
Middlesex Hospital,
London W1N 8AA
Rachel R Phillips, MRCP,
senior registrar in radiology
Stephen H Lee, FRCP, senior
registrar in radiology

Correspondence to:
Dr Phillips.

Br Med J 1990;301:225-6

FIG 1—Fractures of distal metaphyses of radius and ulna of left forearm, showing preservation of bone density and cortical margins

dorsum of his left foot, for which his leg was stabilised. Spontaneous swelling of his left thigh developed in the next 24 hours, and radiography showed fractures of the distal metaphysis and the midshaft of the left femur (fig 2). The density of the bony cortex along the shaft of the femur, the normal dense white line at the metaphysis, and the normal band of lucency in the submetaphyseal region were preserved. These features suggested that the fractures were secondary to trauma and were not due to metabolic bone disease of prematurity. Both of the fractures healed satisfactorily after immobilisation. Routine biochemical screening showed a raised serum alkaline phosphatase activity (975 IU/l three weeks after delivery and 3685 IU/l at 7 weeks (normal range <220 IU/l)). Serum phosphate concentration was low (0.7 mmol/l).

Discussion

These two cases show how fragile the bones of very premature infants are. The fractures were evident after minimally invasive procedures in both cases, and the lack of other fractures or other radiological signs of severe metabolic bone disease imply that they were traumatic in origin. Even without definite evidence of bone disease, which is almost universal in infants born at less than 28 weeks' gestation,¹ premature infants are at risk of fractures and extreme care in handling them is essential.

1 James JR, Congdon PJ, Tryscott J, Horsman A, Arthur R. Osteopenia of prematurity. *Arch Dis Child* 1986;61:871-6.

(Accepted 3 April 1990)

Hammersmith Staff Rounds

Cerebral mass lesions in patients with AIDS

Role and timing of cerebral biopsy

The central nervous system is often affected in patients with AIDS, and cerebral mass lesions are a recognised cause of neurological symptoms of rapid onset. The management of such symptoms will depend on the extent of the disease, its correct diagnosis, and the presence of opportunistic infection or associated disease at other sites. We report on a patient with AIDS who presented with an acute confusional state due to cerebral mass lesions. The case illustrates circumstances when a stereotactic biopsy of the lesion is appropriate and the value of generally available diagnostic tests.

Case history

A 42 year old man presented in 1985 with oral candidiasis and recurrent bacterial infections of the upper respiratory tract. He was found to be seropositive for HIV-I. Investigations at that time gave: haemoglobin concentration of 129 g/l, white cell count of $2.4 \times 10^9/l$, and platelet count of $120 \times 10^9/l$; a test for HIV p24 antigen gave negative results, and his toxoplasma antibody titre was negative for IgG and weakly positive for IgM. During the two years after presentation he had recurrent infections of herpes simplex, seborrhoeic dermatitis, and two generalised seizures. Further investigations during this period included computed tomography of his brain and examination of cerebrospinal fluid, both of which gave normal results.

In April 1989 he presented with confusion and incontinence of urine of abrupt onset. On admission to hospital he scored 5/10 in a mental test, but there were no focal neurological signs. Examination of both retinas showed normal results. He was febrile, but general examination at that time was otherwise unremarkable. The following further investigations gave normal or negative results: chest radiography and finger oximetry; cultures of stool, throat, and skin swabs and of blood; and toxoplasma titre for IgG.

Computed tomography of his brain showed several irregularly defined masses with low attenuation in the basal ganglia, the largest measuring 4×5 cm (fig 1). These did not enhance after intravenous administration of contrast medium. On lumbar puncture the opening pressure was 18 cm of water and the cerebrospinal fluid

appeared clear. The fluid contained eight red blood cells per ml and one white blood cell per ml; no organisms were seen and the results of culture were negative. The protein concentration in the cerebrospinal fluid was 0.6 mg/l and glucose concentration was 6.1 mmol/l. The results of staining for fungi and determination of cryptococcal antigen were negative and those of cytological examination were normal.

Empirical treatment was started for infection with toxoplasma (sulphadiazine 6 g/day, pyrimethamine 25 mg/day, and folinic acid) and for oral and oesophageal candidiasis (oral fluconazole). His symptoms of confusion did not improve, and computed tomography after 28 days' treatment showed that the lesions had increased in number and size; peripheral or ring enhancement of the lesions after intravenous injection of contrast material was also seen. A stereotactic brain biopsy was therefore undertaken. Despite a normal platelet count and normal results of a coagulation screen he had an intracerebral haemorrhage and died 14 hours later. The tissue consisted of aggregates of macrophages (fig 2 (left)), which included an occasional reactive astrocyte and a few inflammatory cells. The macrophages had relatively small nuclei and finely vacuolated cytoplasm. No granulomas, giant cells, or appearances suggesting fungi were seen. Immunohistochemical investigation with a polyclonal antitoxoplasma antibody (Bioquote, United Kingdom) and the avidin-biotin complex method showed several

FIG 1—Two sections from computed tomography of brain showing multiple low attenuation lesions in both cerebral hemispheres. Lesions are consistent with infection with toxoplasma

Department of Medicine,
Hammersmith Hospital,
London W12 0HS

Case presented by:
H Montgomery, MB, senior
house officer

Radiology:
A Adam, FRCP, senior lecturer

Chairman:
C T Dollery, FRCP, professor
of medicine

Discussion group:
J Weber, MRCP, senior
lecturer in infectious diseases
P Volberding, MD, director of
AIDS unit, San Francisco
General Hospital
B Griffin, FRCPATH, professor
of virology
F Scaravilli, FRCPATH, senior
lecturer in neuropathology
(Institute of Neurology,
London)

Series edited by:
Dr Robert Winter.

Br Med J 1990;301:226-8