The future behaviour of the distal femoral and proximal tibial growth plates cannot be predicted. We hope that it will involve only linear growth without a recurrence of the flexion deformity.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

References

We describe a patient with fractures of both bones of the forearm in whom flexible intramedullary nail fixation of the radius alone led to ulnar malunion and a symptomatic distal radio-ulnar joint subluxation. This was successfully treated by ulnar osteotomy.

The majority of diaphyseal fractures of the forearm in children are treated by closed reduction and plaster immobilisation. The indications for surgical intervention include instability, irreducibility and an open wound. Recent reports show that intramedullary nailing is gaining popularity over plate fixation.2-4 Distal radio-ulnar joint (DRUJ) subluxation following intramedullary nailing of the radius alone when both forearm bones are fractured is a rare complication. To our knowledge this has not been previously reported.

Case report
An 11-year-old girl presented with midshaft fractures of both bones of her right non-dominant forearm after a simple fall. On initial radiographs the radial fracture was displaced but the ulnar fracture was not (Fig. 1). The wrist and elbow joints were unaffected, either clinically or radiologically (Fig. 1b). She was treated by closed flexible intramedullary nailing (FIMN) of the radius. The ulnar fracture was treated conservatively as it was apparently undisplaced. The arm was immobilised in an above elbow plaster cast.

At six weeks the cast was removed, radiographs showed the radius to be in good alignment but there was malunion of the ulnar fracture with 12˚ of volar angulation (Fig. 2). At three months review she had wrist pain, which was worse on supination. On examination the range of pronation was 60˚ and supination, 40˚. Radiographs of the wrist showed volar subluxation of the DRUJ with the forearm in supination. The subluxation reduced spontaneously on pronation. At one-year review the wrist pain was more severe. New radiographs showed persistent DRUJ subluxation with no remodelling of the ulna. The radial nail was removed and a corrective osteotomy of the ulna was performed, closing a dorsally-based wedge and securing it with a plate. Subsequent radiographs confirmed the DRUJ to be reduced (Fig. 3). The osteotomy healed uneventfully. When reviewed one year later she was asymptomatic.

Discussion
Fractures involving the shafts of the radius and ulna are among the most common childhood injuries. The majority are treated by closed reduction and cast immobilisation. Indications for operative management of diaphyseal forearm fractures in children include failure to achieve a satisfactory reduction, persistent instability and open fractures.1 Recent reports on intramedullary fixation have reported excellent clinical results and promoted the advantages of this technique over plating in children.2-4 These fractures present specific problems. If a good range of pronation and supination is to be
regained, axial and rotational alignment must be restored. In our case there was axial malalignment but no rotational malalignment confirmed by the quadrangular relationship between bicipital tuberosity, radial styloid, ulnar styloid and the coronoid process. An angulatory deformity of more than 10˚ in a child above the age of ten years fails to remodel adequately with growth, particularly if the fracture is in the proximal half of the forearm.5 In our case the ulna failed to remodel, resulting in symptomatic subluxation of the DRUJ.

Lascombes et al2 recommend FIMN fixation of both radius and ulna. Forearm bones are bound together by the annular ligament above, the triangular ligament below and the interosseous membrane in between. Therefore, osteosynthesis must include both bones since the nailing of a single bone may lead to the displacement of the other.1,2 Our case highlights this. In hindsight stabilisation of both the ulna and the radius, could have avoided this complication. Alternatively, had it been borne in mind that the ulna was in effect being managed conservatively, more frequent radiological monitoring in the early stages of healing would have revealed the angulation at a time when the deformity of the ulna could have been corrected and a new moulded plaster cast applied.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.
Fluorosis-induced hyperparathyroidism mimicking a giant-cell tumour of the femur

M. Chadha, S. Kumar

From the University College of Medical Sciences and Associated Guru Teg Bahadur Hospital, Delhi, India

We report the case of a young woman who, over a period of five years was diagnosed and treated for a giant-cell tumour of bone, osteomalacia and fluorosis. A review of the literature revealed a correlation between these three diagnoses, the primary pathology being fluorosis and the remaining symptoms being secondary manifestations. It is important to be aware of this association, especially in regions with endemic skeletal fluorosis.

Case report

A 28-year-old woman presented in May 1997 with insidious, progressive pain in the right hip and difficulty in walking. Initially, she had been treated elsewhere and a radiograph (Fig. 1) had revealed an osteolytic lesion in the right proximal femur. CT showed features suggestive of a giant-cell tumour. By the time she presented to us she had sustained a pathological fracture of the neck of the femur (Fig. 2). CT-guided fine-needle aspiration cytology was inconclusive. A clinicoradiological diagnosis of a giant-cell tumour of the femur was made. At surgery the lesion was found to be large and measuring 4 cm × 4 cm × 3 cm. It was located in the metaphysis of the femur just below the lesser trochanter. The lesion involved the whole length of the bone and was seen extending up to the lesser trochanter. A biopsy of the lesion was taken and the specimen was sent for histopathological examination. The specimen showed features suggestive of a giant-cell tumour. Histological examination revealed a lesion that was composed of anastomosing groups of fibrovascular stalks with numerous epithelioid and giant-cells. The lesion was richly supplied with blood vessels and had no definite capsule. The histological features were suggestive of a giant-cell tumour of bone. The patient was discharged on the 3rd post-operative day and the lesion was kept under observation. She was reviewed every six months and showed no recurrence of the lesion.

Discussion

Classical teaching in medicine suggests that all signs and symptoms in a patient should be explained by one diagnosis. In our patient, over a period of five years, three different diagnoses were made. The primary pathology was fluorosis with the remaining symptoms being secondary manifestations. It is important to be aware of this association, especially in regions with endemic skeletal fluorosis.

References