BRIEF REPORTS

PERCUTANEOUS AUTOGENOUS BONE-MARROW GRAFTING IN CONGENITAL TIBIAL PSEUDARTHROSIS

N. K. GARG, S. GAUR

Bone marrow contains osteogenic precursor cells which contribute to the production of bone. It has a liquid texture and can be injected percutaneously. We describe a patient with congenital pseudarthrosis of the tibia treated successfully by percutaneous autogenous bone-marrow grafting.

Case report. A 12-year-old boy with the clinical and radiological diagnosis of congenital pseudarthrosis of the

right tibia had been treated by excision of the pseudarthrosis, an intramedullary fibular graft and cancellous bone grafting. Despite immobilisation in a plaster cast, the tibia remained ununited (Fig. 1a) at one year after operation. Unhealthy local skin precluded another open operation, so percutaneous bone-marrow grafting was advised.

This was performed under general anaesthesia. Bone

Fig. 1a

Fig. 1b

N. K. Garg, MS, Orthopaedic Registrar
Neath General Hospital, Neath, West Glamorgan SA11 2LQ, UK.

S. Gaur, MS, DNBE Orth, Lecturer in Orthopaedics
Gandhi Medical College, Bhopal-462 001, India.

Correspondence to Dr N. K. Garg at 22 Kenway Avenue, Cimla, Neath,
West Glamorgan SA11 3TU, UK.

©1995 British Editorial Society of Bone and Joint Surgery
0301-620X/95/5R43 \$2.00

J Bone Joint Surg [Br] 1995;77-B:830-1.

Received 15 March 1994; Accepted after revision 6 October 1994

marrow was aspirated aseptically from the posterior iliac crest and a 16-gauge spinal needle was inserted into the pseudarthrosis. Four aspirations each provided about 5 ml of marrow. The marrow was injected into the pseudarthrosis immediately after aspiration and the limb again placed in a plaster cast. The whole procedure was repeated after three weeks.

By five months, there was successful clinical and radiographic union. Protected weight-bearing was allowed in a

long leg brace. Radiographs at 18 months (Fig. 1b) confirmed sound union of the tibia.

Discussion. Healey et al (1990) used percutaneous bone-marrow grafting for delayed union or nonunion after extensive *en-bloc* resections and reconstructions of primary sarcomas of bone and reported good results. We have used this technique experimentally in rabbits (Sharma et al 1992) and found increased callus production, with early healing of radial osteotomies and bony defects. The technique has also been used as a substitute for open cancellous bone grafting for nonunion; approximately 90% success was reported by Connolly et al (1991) and Garg, Gaur and Sharma (1993).

We believe our case to be the first of its type to be reported. The result was encouraging but the type of suit-

able patient, and the timing, volume and frequency of bone-marrow injections required will need further studies.

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

- Connolly JF, Guse R, Tiedeman J, Dehne R. Autologous marrow injection as a substitute for operative grafting of tibial nonunions. *Clin Orthop* 1991;266:259-70.
- Garg NK, Gaur S, Sharma S. Percutaneous autogenous bone marrow grafting in 20 cases of ununited fracture. *Acta Orthop Scand* 1993;64:671-2.
- Healey JH, Zimmerman PA, McDonnell JM, Lane JM. Percutaneous bone marrow grafting of delayed union and nonunion in cancer patients. *Clin Orthop* 1990;256:280-5.
- Sharma S, Garg NK, Veliath AJ, Subramanian S, Srivastava KK. Percutaneous bone-marrow grafting of osteotomies and bony defects in rabbits. *Acta Orthop Scand* 1992;63:166-9.

DISLOCATION OF THE COCCYX: A CASE REPORT

A. B. M. BERGKAMP, J. A. N. VERHAAR

A 26-year-old woman presented after a fall down stairs with her three-month-old baby in her arms. She landed in a sitting position. Immediately after the accident she was able

to walk, but attended five hours later because of persistent pain in the anal region.

On examination a step was palpable at the level of the

Fig. 1

Fig. 2

Fig. 3

A. B. M. Bergkamp, MD, Senior Resident
J. A. N. Verhaar, MD, PhD, Orthopaedic Surgeon
Department of Orthopaedic Surgery, University Hospital, PO Box 5800,
6202 AZ Maastricht, The Netherlands.

Correspondence to Dr J. A. N. Verhaar.

©1995 British Editorial Society of Bone and Joint Surgery
0301-620X/95/5R46 \$2.00
J Bone Joint Surg [Br] 1995;77-B:831-2.

Received 12 August 1993; Accepted after revision 8 November 1994

sacrococcygeal joint. There was no sign of neurological damage. On rectal examination, the painful displacement of the joint was confirmed. Radiographs showed an anterior dislocation of the coccyx from the sacrum (Fig. 1). After local infiltration of 2% Lidocaine into the dislocated joint, an attempt was made to reduce the dislocation manually, taking care to avoid damage to the rectal mucosa. This manoeuvre proved unsuccessful and the patient was pre-