

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.

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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

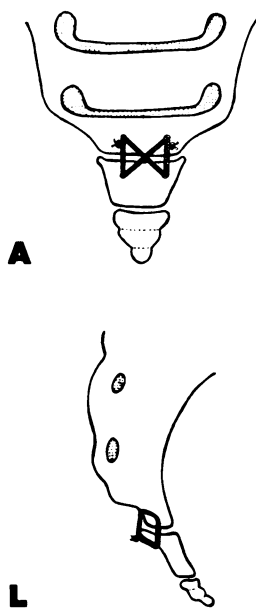


Fig. 2

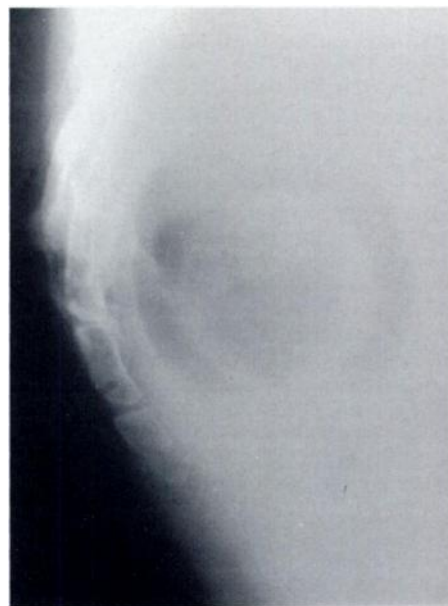


Fig. 3

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.

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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-

pared for an open procedure. Under general anaesthesia and in the knee-elbow position, a central incision was made over the dislocated joint. There was a local haematoma with minor damage to the periosteum. The coccyx was found to be displaced ventrally and 1 cm proximally. Distal traction alone proved ineffective but reduction was achieved using a raspator as a lever. The sacrum and coccyx were fixed together using four vicryl sutures as tension bands (Fig. 2). Postoperative radiographs confirmed reduction (Fig. 3).

The patient was advised not to sit during the first six weeks after surgery, but rehabilitation was uncomplicated and she had no pain. Radiological examination at six weeks and six months after operation showed normal alignment and at two years she had no complaint.

Discussion. We have been unable to find any publication of

this type of traumatic dislocation. Yamashita (1988) mentioned the condition but his article was not published in English. Fractures are more common, probably because of the normal strength of the ligaments.

The need for surgical reduction may be questioned. Excision of the coccyx is performed for coccydynia (Tilscher et al 1986), but the application of the normal principles of trauma surgery led us to reduce the dislocation with success.

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.

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TENOTOMY OF THE LIGAMENTUM PATELLAE IN SPINA BIFIDA: MANAGEMENT OF LIMITED FLEXION RANGE AT THE KNEE

P. S. SANDHU, N. S. BROUGHTON, M. B. MENELAUS

About 5% of children with spina bifida have fixed extension of the knee with limitation of flexion (Dupré and Walker 1972). This causes difficulty in the use of wheelchairs, public seating and getting in and out of vehicles. When the child is small this can be overcome, but by the age of seven or eight years the length of the fixed lower limbs is increasingly awkward.

Most of these children have no active quadriceps; the knees have a featureless appearance similar to that seen in arthrogryposis multiplex congenita (Birch 1977). In some the quadriceps is spastic with a mixed spastic and voluntary pattern in the rest of the leg. We describe treatment for these children by simple division of the ligamentum patellae.

Patients and methods. At the Royal Children's Hospital,

Melbourne, 297 children with spina bifida born between 1960 and 1987 have been examined and kept under review (Broughton et al 1993). Eight presented with limited range of flexion of the knee, causing difficulty with everyday activities. Details are given in Table I.

All operations were performed under general anaesthesia by MBM. With the patient supine, a 1 cm longitudinal incision at the lateral edge of the ligamentum patellae is made opposite the lower pole of the patella. Using retractors the ligamentum patellae is exposed and divided. The patient is then moved so that the lower leg overhangs the end of the operating table. Division of the ligamentum patellae generally produces 50° to 70° of flexion and by further division of the medial and lateral retinacula a flexion range of more than 90° can be achieved. A second incision is sometimes necessary.

A plaster cylinder is applied at 90° flexion. At two weeks the plaster is bivalved and the posterior half used as a night splint for six weeks. During this time passive extension is regained by mobilisation under the direction of a physiotherapist.

Results. All patients had a satisfactory outcome in the long term although three of the knees required further surgery (cases 6 and 8; Table I). All the children continued to walk after surgery in knee-ankle-foot orthoses with pelvic bands. In line with our general experience of high-level spina bifida, walking ceased in adolescence but continued for between two and seven years after surgery. Case 5 con-

P. S. Sandhu, MB BS, MS, Orthopaedic Fellow
N. S. Broughton, FRCS Ed, FRCS, FRACS, Consultant Orthopaedic Surgeon
M. B. Menelaus, MD, FRCS, FRACS, Senior Orthopaedic Consultant
Orthopaedic Department, The Royal Children's Hospital, Flemington Road, Parkville, Victoria 3052, Australia.

Correspondence to Dr M. B. Menelaus.

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