BRIEF REPORTS

DISLOCATION OF THE INTACT FIBULA WITH FRACTURE OF THE MEDIAL MALLEOLUS

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Bosworth's posterior fracture-dislocation of the distal fibula (Bosworth 1947) is an ankle injury which does not fit neatly into any known classification. We report a variation of this uncommon fracture-dislocation which suggests to us that previously reported opinions on the mechanism of injury may have been mistaken.

Case report. A 21-year-old woman suffered a twisting injury of her left ankle (Fig. 1). On examination, the ankle appeared to be subluxed, and an attempt was made to reduce it but without success.

An open reduction of the medial malleolus was then performed and the fragments were fixed with two cancellous screws. To our surprise the intraoperative lateral radiograph (Fig. 2a) showed that the distal fibula had remained in its position of posterior dislocation. Through a further incision the fibula was explored. The anterior and posterior tibiofibular ligaments and the intraosseous membrane were found to be disrupted, with the distal fibula trapped behind the posterior border of the fibular notch. There was no fracture of the fibula. Considerable force was required to reduce the fibula, which was then held in place with a syndesmosis screw placed proximal to the distal tibiofibular joint (Fig. 2b). Finally, the tibiofibular ligaments were repaired.

After two weeks in a plaster cast the ankle was mobilised, but no weight-bearing was allowed for a further four weeks. Two months postoperatively, there was a full painfree range of motion in the ankle.

None of the stigmata of hypermobility were present in this patient.

Discussion. Since posterior fracture-dislocation of the distal part of the fibula was first described by Bosworth in 1947, 28 instances of this injury have been reported (Perry et al 1983). Three of these patients had posterior dislocation of an intact fibula but none of them had a fracture of the medial malleolus and all were described as variants of the Bosworth fracture.

The mechanism of injury of the Bosworth fracture is controversial (Bosworth 1947; Schatzker, McBroom and Dzioba 1977). In 1983 Perry et al suggested a mechanism and a method of classification based on clinical and cadaver studies. They thought that the injuries were the result of an external rotation force applied to the supinated foot and that the first stages were identical to those of a Maisonneuve fracture, with rupture of the anterior and posterior tibiofibular ligaments. The later stages involved posterior dislocation of the fibula, followed by fracture of the fibula and finally fracture of the medial malleolus (or rupture of the deltoid

Fig. 1a

Fig. 1b

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Fig. 2a

Fig. 2b

ligament). Perry et al also stated that if the dislocated fibula did not fracture, the medial structures would remain intact. They referred, as support for their theory, to the three cases with an intact dislocated fibula reported in the literature, none of which had damage to the medial structures, and suggested that these three cases represented an earlier stage in the development of the complete injury. Our case, however, in which posterior dislocation of an intact fibula was combined with a medial malleolar fracture seems to contradict the proposed mechanism.

It is unlikely that external rotation of a supinated foot could cause posterior dislocation of the fibula *and* a medial malleolar fracture. Such an injury might result from external rotation of a pronated foot, or the position of the foot might have changed during the injury, from supination to pronation. Perhaps local anatomical variations also play a role.

Since the exact nature of this type of injury still remains unclear and because of the severity of the associated ligamentous damage, there is no place for non-operative management. We believe that it is wise to explore both sides of the ankle and repair the damaged structures both medially and laterally.

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THE KNEE FLEXION TEST: A NEW TEST FOR LUMBOSACRAL ROOT TENSION

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The usual clinical tests to detect tension and irritation in the nerve roots forming the femoral or the sciatic nerve are well known. The straight-leg-raising (SLR) test and the femoral-nerve-stretch test involve the L5, S1 or S2 roots and the L2 to L4 roots respectively.

We report a new test, the knee-flexion test, which indicates tension in the lumbosacral roots. It is positive when, with the patient in the prone position, flexion of the knee causes or aggravates pain in the ipsilateral buttock and/or the posterior aspect of the thigh (Fig. 1). A positive test appears to be a reliable predictor of herniation of a lower lumbar disc.

Patients, methods and results. Over a three-year period we examined 512 patients with clinical evidence of lumbar disc herniation. Tension tests, including the SLR and the knee-flexion tests were performed in each patient, and the results were graded as negative, slight, moderate or marked.

The knee-flexion test was positive in 48 patients (29 men and 19 women aged from 22 to 57 years). Of these, 34 underwent CT, MRI and/or myelography; seven refused these investigations and seven did not return for further evaluation. In 32 of the 34 patients, imaging

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