

the superficial peroneal nerve. Sensation and strength were all steadily improving.

### Discussion

A high index of suspicion and careful clinical evaluation will detect most impending or established cases of compartment syndrome. Compartment pressure measurements are a useful adjunct to evaluation. If they are higher than 40 mm Hg, then urgent decompression is called for.<sup>1</sup> Recent studies advocate the determination of the difference between the mean arterial and compartmental pressures rather than absolute tissue pressure measurements.<sup>9, 10</sup> Our case easily satisfied both sets of criteria.

Once the diagnosis of compartment syndrome is confirmed or suspected, fasciotomy should be performed without delay. This entails incision of the underlying skin and investing fascia of the compartment, relieving pressure and enhancing tissue perfusion. Delayed primary closure is recommended, but skin edge retraction often necessitates a split thickness skin graft.<sup>11</sup>

In our patient rupture of the medial head of gastrocnemius caused bleeding into the superficial posterior compartment and an increase in intracompartmental pressure. This eventually also led to compromise of the anterior and lateral compartments. Allen and Barnes<sup>12</sup> described an acute superficial posterior compartment syndrome following a non-contact squash injury. Urgent fasciotomy led to an uneventful recovery. The delay in our case probably accounts for involvement of the other compartments because of continuing haemorrhage. This prolonged period of elevated intracompartmental pressure would also explain the residual neurological symptoms and signs.

Moyer *et al*<sup>13</sup> retrospectively reviewed three patients who developed atraumatic acute compartment syndrome of the lower extremity, with injuries sustained in a similar manner to

an ankle sprain. The compartment syndromes appeared to arise in a similar manner as a result of a muscle strain or tear with haemorrhage into the compartment. Williams *et al*<sup>14</sup> presented a case where rupture of peroneus longus caused haemorrhage into the lateral compartment which resulted in a delayed diagnosis of compartment syndrome.

The case presented illustrates the potential dangers of an apparently benign non-contact injury. It emphasises the importance of a full examination and a high index of suspicion for compartment syndrome whenever any painful soft tissue injury is being assessed.

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### Commentary

This is a fascinating case report. As has been pointed out by the authors these conditions are rare but can have serious consequences if missed. Without doubt the initial insult was the ruptured gastrocnemius, confirmed by both the symptoms and operative findings. However, the most interesting aspect is how did the anterior compartment become affected?

Almost by definition the four compartments of the lower leg act as discrete pressure units; a raised pressure in one is rarely transmitted to the others, and indeed extensive experience of measuring compartment pressures has shown this to be the case.

In this instance, however, the raised pressure in the superficial posterior compartment was transmitted, not just into the adjacent compartments, but right across the leg to cause a definite anterior compartment syndrome, with grossly increased pressure and long term neurological deficits in the distribution of the deep peroneal nerve.

I would be very interested in any ideas the authors may have as to how this might have occurred. Could it be the length of time involved? If so, this case strongly emphasises the importance of early diagnosis and treatment.

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