CASE REPORT

Entrapment of a displaced common peroneal nerve following knee ligament reconstruction

A. S. Montgomery, R. Birch, A. Malone
From Royal National Orthopaedic Hospital, Stanmore, England

We present a case of disruption of the posterolateral corner of the knee with avulsion of the tendon of biceps femoris. Repair and reconstruction included an allogenic tendon graft to replace the posterior cruciate ligament. Surgery was followed by a complete common peroneal nerve palsy. Revision surgery revealed that the nerve had been displaced anteriorly by avulsion of the biceps tendon and the tendon graft encircled it. Release of the nerve restored normal function at five months.

Case report

A 37-year-old woman pedestrian was struck on the left knee while walking, by a car traveling at about 30 mph. She sustained a fracture of the fibular styloid which was initially repaired with a bone suture. There was no lesion of the common peroneal nerve at this stage. The knee became increasingly unstable and three years later a diagnosis of an anterior cruciate ligament rupture and posterolateral corner injury was confirmed by MRI. A hamstring reconstruction of the anterior cruciate ligament and an allogenic tendon graft of the posterior cruciate ligament were subsequently performed (Fig. 1). The patient awoke after the operation with a painless foot-drop and complete motor and sensory loss. There was no recovery at three months and she was referred to our Nerve Injury Unit.

Examination confirmed no improvement from the initial post-operative state. A positive Tinel's sign was found on the posterolateral aspect of the popliteal fossa and the biceps tendon was felt to be in a more anterior position compared with the uninjured knee. At operation, the common peroneal nerve was found to be displaced anteriorly and tented upwards with the displaced biceps tendon. The allogenic graft encircled the nerve and compressed it to one-third of its normal diameter (Fig. 2). The graft was divided, releasing the nerve which then slid freely on flexion and extension of the knee. The nerve, although narrowed, was anatomically intact (Fig. 3). The tendon graft was then repaired.

Recovery for the deep division of the nerve was apparent at four weeks. Using the Medical Research Council grading1 (maximum 5), tibialis anterior was a grade 3 and extensor digitorum communis grade 2. There was no evidence of recovery for the superficial peroneal division. Nerve conduction studies showed no sensory action potential for the left superficial peroneal nerve and no motor action potential for the deep division. Electromyographic examination confirmed complete denervation of peroneus longus and extensor hallucis longus. Fibrillation was observed in...
these muscles. Concentric needle examination of tibialis anterior showed two motor units firing against a background of fibrillation.

At five months however, the patient reported complete recovery of function, a stable knee and that she had returned to full activities. She declined further neurophysiological investigation. She described the strength in her muscles as normal, and that there was no disturbance of sensation. At no time did she experience neuropathic pain.

Discussion
The vulnerability of the common peroneal nerve in avulsion fractures of the fibular styloid was described by Platt.2 The nerve was found to be ruptured in three cases. Recovery was good following suture repair. Watson-Jones3 noted extensive longitudinal injury to the nerve when the lateral ligamentous complex had been disrupted and described the prognosis as poor. In our patient, the biceps tendon was avulsed from the fibular styloid and displaced anteriorly with the common peroneal nerve because of the nerve’s close relationship with the enveloping fascia of the muscle. Although the reconstruction had been performed skillfully, without apparent complication, the nerve was caught and compressed by the tendon graft.

The nerve lesion was one of almost complete degeneration with a small component of conduction block attributable to compression. The nerve was not interrupted, so the lesion was more favourable than one caused by a plate or screw. The rapid recovery implies a component of prolonged conduction block with limited Wallerian degeneration (axonotmesis)4 while the absence of neuropathic pain indicated that the nerve had not been transected.

Severe injury to the ligaments of the knee distorts anatomical planes. Avulsion of the biceps tendon can displace the common peroneal nerve to an abnormal position. The nerve is, therefore, at risk even with the most skillfully performed surgery, and merits exploration at the time of reconstruction.

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