REPAIR OF THE COMMON PERONEAL NERVE

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Elective repair of lesions of the common peroneal nerve was carried out in 27 patients between 1982 and 1992. Twenty-three have been reviewed of whom 11 recovered power sufficient to prevent foot drop and 13 recovered protective sensation or better.

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Reported results of repair of the common peroneal nerve are not good. Seddon (1975) found recovery of functional ankle extension in one-third of 72 cases of repair of the common peroneal nerve and also of the lateral division of the sciatic nerve. Sunderland (1972) described various features of the common peroneal nerve which make it vulnerable to injury. It runs a superficial course, is tethered to the sciatic trunk and is especially at risk where it divides at the neck of the fibula. It has less supportive connective tissue and fewer autonomic fibres than the tibial nerve; thus in any traction injury, the motor and sensory fibres bear the brunt of the injury.

PATIENTS AND METHODS

Between July 1982 and December 1992 we performed elective repair on 27 common peroneal nerves. Twenty-three patients were available for follow-up (17 men, 6 women). We excluded those who had an associated posterior tibial or sciatic nerve injury and those with a vascular injury. The average age at injury was 23 years 10 months (6 years 6 months to 41 years 3 months) and the average interval between injury and repair was 8 months (0 to 59). Traction injuries were the most common (usually during sport) followed by penetrating and iatrogenic injuries (Table 1). Open wounds were classified as tidy (sharp) and untidy (crush or contamination) after Rank, Wakefield and Hueston (1973). The interval between operation and review was 34 months (7 to 103); the three patients reviewed within 18 months of repair all had a good result.

Table I. Details of the nature and type of injury in 23 patients who had repair of the common peroneal nerve

<table>
<thead>
<tr>
<th>Injury</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>7</td>
</tr>
<tr>
<td>Glass wound</td>
<td>4</td>
</tr>
<tr>
<td>Other wound</td>
<td>3</td>
</tr>
<tr>
<td>Iatrogenic</td>
<td>3</td>
</tr>
<tr>
<td>Road-traffic accident</td>
<td>3</td>
</tr>
<tr>
<td>Shotgun</td>
<td>1</td>
</tr>
<tr>
<td>Chainsaw</td>
<td>1</td>
</tr>
<tr>
<td>Door</td>
<td>1</td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Traction injury</td>
<td>12</td>
</tr>
<tr>
<td>Tidy wound</td>
<td>6</td>
</tr>
<tr>
<td>Untidy wound</td>
<td>5</td>
</tr>
</tbody>
</table>

Operative treatment. Direct suture was possible in three patients. In 18 patients the ipsilateral sural nerve was used as a free graft and in two a free muscle graft, frozen and thawed. The gap ranged from 2 to 15 cm. In all patients the injured nerve ends were trimmed back to healthy-looking faces, with pouting bundles. After operation the repair was protected by immobilising the knee in a plaster-of-Paris splint. In 18 patients the knee was brought into extension in stages, changing the splints regularly between five and 12 weeks. A single splint was used in five patients for three to six weeks.

We now use serial splintage for six weeks after nerve grafting, at 90° for three weeks followed by progressive straightening over the next three weeks, and for 12 weeks after direct suture. In children splintage for three weeks is considered to be adequate.

Assessment of recovery. Motor recovery was assessed using MRC grades and classified after Seddon (1975) as good, fair, poor or bad. Each muscle supplied by the common peroneal nerve was separately graded; recovery of power of grade M4 in the evertors and long extensors of the ankle indicated recovery from foot drop (Seddon 1975). Sensory recovery was assessed for each of the three cutaneous branches of the nerve. Grade S2 and above was considered as useful, providing protective sensation, or
better. All patients were asked about persisting functional loss and pain.

RESULTS

Patient assessment. Subjectively, three patients had problems with foot drop or inversion; the rest felt that they were improving, and eight felt that they were living normal or near-normal lifestyles. One patient continued to wear an ankle-foot orthosis (foot-drop splint). Such orthoses were not liked; most patients preferred to adapt to their injury by the use of raised heels. Two patients were worse post-operatively; one experienced occasional deep pain and the other had pain with an orthosis due to hypertrophic scarring after tendon transfer. Walking was improved (without a splint) in 15 patients at follow-up and eight had returned to competitive sport.

Motor and sensory recovery. Eleven patients had a good result, with recovery of power in the proximal muscles of grade 4 or 5 (Table II). Three patients had a fair result, with recovery of power to grade 3. There was no significant functional improvement in the remaining nine, six of whom had no measurable motor recovery. The only full recovery occurred in the youngest patient, but otherwise age did not seem to influence outcome; neither did the overall gap. The quality of recovery was most influenced by the nature of the injury (Table III) and the delay between injury and repair (Table IV). Tidy wounds gave the best recovery, untidy the worst; traction injuries were between the two. There was failure in five of the 14 repairs performed within six months of injury and in four of the nine performed after six months. Thirteen patients regained protective sensation or better and no patient complained of cutaneous hypersensitivity.

Tendon transfer. Tibialis tendon transfer was performed in seven of the nine failures, and it is planned in two more. After transfer four patients experienced no difficulty in walking on an even surface, and one has returned to competitive sport. Tendon transfer failed in one patient due to pain from hypertrophic scarring. He had a very late neurological recovery, nearly three years after the nerve repair, and is now awaiting reversal of his tendon transfer. Tibialis posterior transfer appears to be more effective when there is minor recovery in the evertor muscles (M2).

DISCUSSION

Seddon's large series, reported in 1975, included many examples of war wounds from missile injury. We have followed his methods of assessment. He considered that only recovery of power of grade M4 or better was functionally worthwhile and that the return of sensation was of relative unimportance in the common peroneal nerve. Although motor recovery was better after repair of the tibial nerve, significant pain was common.

Platt (1928) described traction rupture of the common peroneal nerve from varus injury to the knee, and this is the most common lesion in civilian practice. Sedel and Nizard (1993) reported 17 grafts for rupture of the nerve to bridge gaps of between 7 and 20 cm. All but one patient were followed up for a minimum of 18 months, with satisfactory results in six, fair in six and poor in four. Palliative tendon transfer was required in seven patients and a subtalar arthrodesis in three.

Delaria et al (1983) compared recovery of the tibial and peroneal components of the sciatic nerve after proximal injury. Recovery was excellent in four of the nine grafted patients; in four more there was recovery of the tibial but not the peroneal component, and there was no recovery in one case. Stellini (1982) described the results of grafting 52 peripheral nerves, including five common peroneal nerves. Recovery was better in younger patients and in those with shorter grafts. Demuyck and Zuker (1987) had three good results from four repairs of the nerve in teenage patients.

Both Sedel (1985) and Millesi (1986) found tendon transfer benefited patients after failure of nerve repair. Millesi noted improved recovery of those muscles supplied by the common peroneal nerve after tendon transfer, and suggested that this may be due to a change in muscle and nerve dynamics in the injured leg.

All but one of our patients reported an improvement in pain after the nerve repair. Eleven of the 23 had motor...
recovery sufficient to overcome foot drop, and 13 had recovery of protective sensation or better. Early repair of the nerve is recommended; tendon transfer is reserved for those patients in whom there is no significant recovery at one year.

The authors chose not to respond to the request for a conflict of interest statement.

REFERENCES


