Clinical and Functional Outcomes after Multiligament Knee Injury with Associated Peroneal Nerve Palsy: Comparison with a Matched Control Group at 2-18 Years

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Peroneal nerve (PN) injury in multiligament knee injuries (MLKI)

- Reported incidence = 25%\textsuperscript{6,7,9}
- Mechanism:
  - Hyperextension and varus stress\textsuperscript{1}
  - Often high-energy\textsuperscript{4,5,9}
Background

• Significant functional impairment
  • Loss of ankle dorsiflexion/eversion
  • Loss of dorsal foot sensation
  • Only about 1/3 get full recovery\(^3,6,7\)

• Paucity of data on clinical and functional outcomes
Purpose

1) Report clinical and functional outcomes after MLKI with concomitantly PN injury

2) Compare recovery and outcomes with partial versus complete PN injury

3) Compare outcomes to a matched cohort of MLKI without concomitant PN injury
Methods

• Level III Retrospective comparative study (1993-2010)

• Patients with MLKI (n= 114)
  • Patients with Peroneal nerve Injury (PI)
    • Complete PN palsy (CNP)
    • Partial PN palsy (PNP)

• Matched cohort: No peroneal nerve Injury (NI)
  • Matched for age, gender, and Schenck Classification
Methods

- Motor strength at last clinical follow-up
  - Manual muscle testing (1-5/5)
  - Tibialis Anterior (TA)
  - Extensor Hallucis Longus (EHL)

- Outcomes scores at 2-18 yr follow-up (mean 6.0 years)
  - IKDC
  - Lysholm
Results

Peroneal Nerve Injury (PI) Group

- 27 patients
  - 9 Complete peroneal nerve palsy (CNP)
  - 18 Partial peroneal nerve palsy (PNP)

- Prevalence = 23.7%

- Treatment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>CNP=9</th>
<th>PNP=18</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Non-operative</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Neurolysis</td>
<td>2</td>
<td>4</td>
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<tr>
<td>Tendon transfer</td>
<td>3</td>
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<tr>
<td>Nerve transfer</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Combined nerve &amp; tendon transfer</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Additional Surgery</td>
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<td></td>
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<tr>
<td>1 (below knee amputation*)</td>
<td>2 (1 TKA, 1 arthrodesis)</td>
<td></td>
</tr>
</tbody>
</table>

*excluded from peroneal nerve comparison

*Partial tibial nerve transfer to tibialis anterior motor branch of peroneal nerve*
Results

Peroneal Nerve Injury Outcomes

- TA motor strength antigravity (≥3/5)
  - CNP: 37.5% (3/8)
  - PNP: 83.3% (15/18)
  - p = 0.06

- EHL motor strength antigravity (≥3/5)
  - CNP: 12.5% (1/8)
  - PNP: 72.2% (13/18)
  - p = 0.0093
Results
Peroneal Nerve Injury Outcomes

• IKDC and Lysholm Scores

• No significant difference between complete peroneal nerve palsy and partial peroneal nerve palsy
Results

Matched Cohort

- 20 patients per group with ≥ 2 year fu
  - **Peroneal Nerve Injury (PI)**
    - 6 CNP, 14 PNP
  - **No Peroneal Nerve Injury (NI)**

<table>
<thead>
<tr>
<th></th>
<th>PI</th>
<th>NI</th>
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<tbody>
<tr>
<td>Gender</td>
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<tr>
<td>- Male</td>
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<tr>
<td>- Female</td>
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<td>Age</td>
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<td>29.5</td>
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<tr>
<td>- KD-I</td>
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<td>10</td>
<td>7</td>
</tr>
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<td>5</td>
<td>8</td>
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<td>- KD-V</td>
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</table>
Results

Matched Cohort Injury Outcomes

- PI group had **significantly worse** outcomes than NI group

<table>
<thead>
<tr>
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<th>PI</th>
<th>NI</th>
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<tbody>
<tr>
<td>IKDC</td>
<td>64.5</td>
<td>77.3</td>
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<tr>
<td>Lysholm</td>
<td>67.1</td>
<td>83</td>
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</table>

p = 0.036
p = 0.023


Conclusions

• Our series of multiligament knee injuries:

  • No significant difference in IKDC or Lysholm scores between patients with complete versus partial peroneal nerve palsy

  • Patients with partial peroneal nerve palsy more often regained antigravity EHL strength but not TA strength
Conclusions

• Our series of multiligament knee injuries:

• Patients *with peroneal nerve injury* have significantly worse IKDC and Lysholm scores than matched patients without peroneal nerve injury
### References


