Unusual symptomatology treated by neurolysis:
About 119 neurolysis of the common fibular nerve at the fibular neck mainly associated with neurolysis of the posterior tibial nerve at the tarsal tunnel

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Anatomy

Common Peroneal Nerve (CPN)

Posterior Tibial Nerve (PTN)

Peripheral entrapment neuropathies of the lower extremity, Koppel, NEJM, 1960

Figure 5. Relations of the Posterior Tibial and Plantar Nerves. Note the passage of the plantar nerves beneath the edge of the abductor hallucis muscle.
Sensitive Territories

Entrapment Neuropathies of the Lower Extremity
Michael P. Bowley, MD, PhD, Christopher T. Doughty, MDb
Uncommon Compressive Syndrome

• **Common Peroneal Nerve Compressive Syndrome at the fibular neck**
  • Most frequently
  • First described and surgically treated in 1952, H. Garland & D. Moorehouse: « Compressive lesion of the external popliteal (common peroneal) nerve: « the foot going to sleep », « foot drop »

• **Tarsal Tunnel Syndrome with Posterior Tibial Nerve**
  • Recently described by Kopell in 1960 (Keck and Lam 1962) and first release by Keck in 1969
  • Weakness of flexion of toes and abduction of toes

• **Etiologies**: IDIOPATHIC, traumatic, iatrogenic, intrinsic and extrinsic compression, diabetes.
Our series: Population: 119 Neurolysis

• Atypical pains could be linked to double compressive syndrome?

• Retrospective series, 2 centers, 3 years (2015-2018)

• One surgeon, 119 neurolysis:
  • 115 dual neurolysis (CPN at the fibular neck and PTN at the tarsal tunnel)
  • 13 neurolysis of both lower limbs
  • 1 neurolysis of CPN only
  • 3 neurolysis of PTN only
Our series: Population: 119 Neurolysis

- Mostly females (68 females & 38 males)
- Mean age: 55 years

- Reason for consultation:
  - Global pain of lower limbs: 105 cases (88%)
  - Associated or isolated paresthesia: 50 cases (42%)

- Average time of evolution before consulting: 34 months

- Surgical history: 36% of cases (Knee arthroscopy, Total hip arthroplasty, Total knee arthroplasty)

- Other medical histories: Obesity or overweight 43%, Diabetes mellitus 11%
Clinical Characteristics

Symptomatology: Pain

• Mean duration of pain: 34 months
• Average NAS (Numerical analogue scale) of pain: 6/10 (Max 9/10)
• Irradiation of pain: 80 cases (76%): Upward or downward
• Associated signs: Cramps (46 cases, 38%, Leg > Foot > Thigh), Pruritus (10 cases, 8%):

Physical exam

• Irritative Syndrome (Pseudo-Tinel Sign): 96 cases (81%)
• Hypoesthesia: 28 cases (24%)
• Motor Disorder: 10 cases (8%)
Paraclinical Investigations

• **Electrophysiological studies**: 110 cases (92%)
  * Positive findings: 87 (80%)
    * TPN: 52 (60%)
    * CPN: 18 (21%)
    * CPN + TPN: 17 (19%)
  * Normal or other pathologies (Diabetic neuropathy, Radiculopathy): 23 (20%)

• X-ray (lumbar spine, knee, ankle)

• If discordant ENMG or diagnostic doubt: Therapeutic test: Corticoids infiltration: 37 limbs (v. good improvement or improvement: 62.5%)
Surgery

• Average time between 1\textsuperscript{st} consultation and surgery: 18 weeks.

• Mainly dual neurolysis (CPN + PTN) (97%) but only 19% had dual electrophysiological abnormalities.

• CPN neurolysis at the fibular neck: Direct approach, widely open of the arcade of the Tibial anterior and muscle release up to division of CPN.

• Neurolysis of TPN at the tarsal tunnel: Direct approach, opening of Flexor digitorum longus retinaculum and opening of Abductor hallucis aponeurosis.
Results

• Per-operative abnormalities > 90%

<table>
<thead>
<tr>
<th>Per-operative</th>
<th>CPN</th>
<th>TPN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drab</td>
<td>35 (30%)</td>
<td>32 (27%)</td>
</tr>
<tr>
<td>Compressed</td>
<td>19 (16%)</td>
<td>27 (23%)</td>
</tr>
<tr>
<td>Spread</td>
<td>15 (12%)</td>
<td>Inflammatory 21 (18%)</td>
</tr>
</tbody>
</table>

• D+0: **Constant extinction of initial pain**

• D+21:
  • Mean NAS of pain: **3/10**
  • Persistent pain > 6/10 among 26 neurolysis (22%) but different pain
  • Usual pain killers and Gabapentin
  • 38 patients: Infiltration in both post-operative sites

• Last follow up (Average 20 months): Mean NAS of pain: **2/10**
14 Complications (12%)

<table>
<thead>
<tr>
<th>Complication</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound disunion (Ankle, healing with simple cares)</td>
<td>8 Neurolysis (7%)</td>
</tr>
<tr>
<td>Non compressive hematomum</td>
<td>2 (1 knee and 1 ankle)</td>
</tr>
<tr>
<td>Hypoesthesia</td>
<td>2 Posterior Tibial Nerve territory</td>
</tr>
<tr>
<td>Stifness (Resolving in 4 months)</td>
<td>1 antalgic knee flexion deformity + 1 antalgic equinus ankle</td>
</tr>
<tr>
<td>Recurrence (Surgical revision with dual neurolysis)</td>
<td>1 Common Fibular Nerve</td>
</tr>
</tbody>
</table>
Discussion

CPN (fibular neck)
- 16 series, 1 metanalysis
- Non-surgical treatment inefficient
- Only surgery is efficient

TPN (tarsal tunnel)
- 20 series & 11 series about revision procedure for failed initial release
- Diagnosis challenging
- Controversial treatment
  - Initial conservative treatment?
  - Efficient surgery: Iterative and extensive neurolysis

Multifactorial ætiologia
Several surgical procedures
## Common Peroneal Nerve

<table>
<thead>
<tr>
<th>Series</th>
<th>Neurolysis</th>
<th>ENMG</th>
<th>Results</th>
<th>Follow-up</th>
<th>Complications</th>
<th>Commentaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dellon, 2003</td>
<td>1158</td>
<td>/</td>
<td>Improvement 82.5%</td>
<td>/</td>
<td>/</td>
<td>Metanalysis, diabetes mellitus, Triple neurolysis, ulcer, amputation</td>
</tr>
<tr>
<td>Ducic, 2012</td>
<td>167</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>25</td>
<td>Safely &amp; effectively minimal skin incision, combinate neurolysis of CPN branches</td>
</tr>
<tr>
<td>Kim, 2004</td>
<td>121</td>
<td>/</td>
<td>NAS pain 2.3</td>
<td>25.3 months</td>
<td>/</td>
<td>All aetiology, all surgical technics</td>
</tr>
<tr>
<td>Our series</td>
<td>119</td>
<td>110</td>
<td>NAS pain 2/10</td>
<td>20 months</td>
<td>14</td>
<td>Dual neurolysis (CPN + TPN)</td>
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## Tibial Posterior Nerve

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<th>ENMG</th>
<th>Results</th>
<th>F-up</th>
<th>Complications</th>
<th>Commentaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mullick et Dellon, 2005</td>
<td>87</td>
<td>46</td>
<td>82% excellent, 11% good, 5% fair, 2% poor</td>
<td>3.6 years</td>
<td>/</td>
<td>Four tunnels neurolysis, diabetes</td>
</tr>
<tr>
<td>Sammarco, 2003</td>
<td>75</td>
<td>75</td>
<td>Significant improvement (MFS)</td>
<td>58 months</td>
<td>/</td>
<td>PTN + branches neurolysis</td>
</tr>
<tr>
<td>Gondring, 2003</td>
<td>68</td>
<td>68</td>
<td>Pain decreased</td>
<td>5 weeks</td>
<td>1</td>
<td>Two tunnels neurolysis Medical et surgical</td>
</tr>
<tr>
<td>Our series</td>
<td>119</td>
<td>110</td>
<td>NAS pain 2/10</td>
<td>20 months</td>
<td>14</td>
<td>Dual Neurolysis (CPN + TPN)</td>
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Discussion: Our series

- **Limits**
  - Retrospective design

- **Strengths**
  - First series with dual neurolysis (CPN + TPN)
  - 119 neurolysis
  - Only one surgeon
  - Electrophysiological studies among > 90% patients: Documented compression of nerves
  - Long term follow-up (Average 20 months)
Conclusion: According to our series

• **First** series with consequent cases of dual neurolysis for idiopathic compressive syndrome

• **Underestimated**

• Atypical presentation and challenging diagnostic

• **No concordance** between
  • Symptoms localization and
  • Compression

• **Efficiency** of dual neurolysis: Diminution of pain (Average decreased NAS of pain: 6 to 2)

• Perspective: Prospective and controlled study
Bibliography

Thank you for your attention