NERVE SURGERY IN LEPROSY

Dr Dinkar Palande
NERVE TRUNK DAMAGE MAIN FACTORS

INFECTION----IMMUNE RESPONSE

MECHANICAL FACTORS---TRAUMA
SEQUENCE OF EVENTS

MICROTRAUMATA
INFLAMMATION
BACILLARY INVASION
OEDEMA-COMPRESSION
DIMINISHED MOBILITY
ENTRAPMENT - STRETCH TR.
FURTHER OEDEMA
MORE COMPRESSION
DAMAGE OCCURS WHERE THE NERVE TRUNK IS ...

• Superficial
• On bone
• Crosses a joint
• In a tunnel
NERVE TRUNK INJURED BY
PRESSURE
STRETCH
FRICITION
NEURITIS IN LEPROSY

ACUTE

SUB-ACUTE

RECURRENT

SEGMENTAL - EXTENSIVE
NEURITIS

IRRITATIVE NERVE SYNDROME

SILENT

SLOW COURSE WITH REMISSIONS AND EXACERBATIONS

RAPIDLY PROGRESSIVE
**NEURITIS CLASSIFICATION**

- Clinically uninvolved but infected
- Clinically involved but without nerve function deficit and with or without hyperalgesia
- Clinically uninvolved but with nerve function deficit
- Clinically involved and with functional nerve deficit
- Nerve abscess: acute, chronic, sinus
- Fibroed atrophic nerve
NERVE ABSCESS

ACUTE CHRONIC

COLLAR-STUD ABSCESS
ASSESSMENT OF NEURITIS

NUMBER AND EXTENT
PAIN-TENDERNESS-MOBILITY
STRETCH-COMPRESSION SIGNS
MOTOR-SENSORY-ELECTRICAL
NERVE ABSCESS
SITUATION IN 1968 – S. KARAT
NERVE INVOLVEMENT IN LEPROSY
ILL-UNDERSTOOD, NEGLECTED,
IGNORED IN MASS TREATMENT PROGRAMME.
TREATMENT FOR NERVE INVOLVEMENT THEN:
CHLOROQUINE, CHANGE OF SPECIFIC DRUG
LATE SURGERY TO RELIEVE PAIN
STRIPPING, INCISIONS.
AIMS OF MANAGEMENT

RELIEVE EXISTING INJURY
PREVENT TRAUMA
REDUCE OEDEMA
REDUCE INFLAMMATION
REDUCE INFECTION AND
HARMFUL IMMUNE RESPONSE
<table>
<thead>
<tr>
<th>INITIAL TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYSICAL</td>
</tr>
<tr>
<td>SPLINTING</td>
</tr>
<tr>
<td>THERMOSTASIS</td>
</tr>
<tr>
<td>GENERAL REST</td>
</tr>
</tbody>
</table>
MEDICAL TREATMENT

B.663.  300 mgm o.d.
PREDNISOLONE 30–60 mgm o.d.
THALIDOMIDE (L.L. CASES).
NERVE PROTECTION.
SURGERY DONE
WHEN MEDICAL TREATMENT FAILED
AFTER 2 WEEKS TRIAL,
REPEATED NERVE FUNCTION—
--EVALUATIONS ESSENTIAL.
THE PROBLEME IS TO CHOOSE THE "RIGHT MOMENT" WHEN GOOD MEDICAL TREATMENT CANNOT REDRESS THE NERVE DAMAGE
NERVE SURGERY INDICATED WHEN
MEDICAL TREATMENT FAILS
2 OF 5 CRITERIA ARE PRESENT.
CRITERIA – SELECTION – SURGERY

PERSISTANCE OF (2/5)
1. NERVE FUNCTION DEFICIT
2. STRETCH / COMPRESSION SIGNS
3. PAIN AND TENDERNESS
4. NERVE ABSCESS
5. PAINFUL NERVE DISLOCATION.
NERVE SURGERY
MUST BE DONE EARLY/DELIcATELY
WHEN INDICATED
MAGNIFICATION GREAT HELP.
NEURITIS

SEVERITY

ACUTE NEURITIS WITHOUT PARALYSIS
RARELY

WITH EARLY PARALYSIS
OCCASIONALLY

INTRACTABLE PAIN
ALWAYS
NERVES AMENABLE TO SURGERY

POSTERIOR TIBIAL  AT ANKLE
ULNAR  AT ELBOW
MEDIAN  AT WRIST
LAT. POPLITEAL  AT FIBULAR NECK
NERVES REQUIRE SURGERY

• Posterior Tibial
• Medial-Ulnar
• Lateral popliteal

• Often
• Occasionally
• Rarely
OPERATIVE FINDINGS

CONSTRUCTING TUNELL
PROXIMAL SWELLING
THICKENED SHEATHS
INCREASED INTRANEURAL TENSION
NODULES
COLLAR-STUD ABSCESS
TYPE OF NERVE SURGERY

EXTERNAL DECOMPRESSION
EPINEUROTOMY
EPICONDYLECTOMY
INTERNAL NEUROLYSIS
EXCISION ABSCESS
EVACUATION
SECTION OF THE ULNAR NERVE AT VARIOUS LEVELS IN THE LOWER 1/3rd OF THE ARM
Limited fascicular neurolysis of the ulnar nerve near medial epicondyle.

Different structural patterns of tunicular inside a nerve.
NERVE SURGERY IS PART OF OVERALL TREATMENT, ESSENTIAL WHEN INDICATED, POTENTIALLY HARMFUL.
MEDIAN NERVE: EARLY SURGERY
WITHIN ONE TO TWO MONTHS
EXCELLENT RECOVERY IN 80%
CARAYON AND BOURREL 1970-71
P.T. COMPRESSION EFFECTS
DEMONSTRATED BY
LYMPHANGIOGRAPHY AND
ANGIOGRAPHY INVESTIGATIONS
PIONEERED P.T. NERVE SURGERY
MEDICAL TREATMENT CAN RELIEVE A PATIENT OF HANSEN BACILLI. EPIDEMIOLOGIST IS SATISFIED BUT IN 30% OF CASES HYPERTROPHIC NEURITIS ➔ LOSS OF SENSITIVITY ➔ SUPERINFECTION ➔ PLANTAR ULCERS ➔ SPONTANEOUS MUTILATIONS

= MAIN COMPLICATION OF LEPROSY

XII INTERNATIONAL LEPROSY CONGRESS, 1984 NEW DELHI

Slide from Andre Carayon & Prof. Bourrel
THE IMMUNOLOGIST SAYS: "IT IS AN IMMUNOLOGICAL AND INFLAMMATORY PHENOMENA!"

HYPERTROPHIC NEURITIS

THE SURGEON SEES AN ADDITIONAL MECHANICAL PHENOMENA = INTERNAL COMPRESSION

THICKENED INEXTENSIBLE SHEATH

GRANULATION TISSUE

Slide from Andre Carayon & Prof. Bourrel
POSTERIOR TIBIAL NEUROVASCULAR COMPLEX INVOLVEMENT
LEADS TO ANAESTHESIA, INTRINSIC MUSCLE PARALYSIS,
PERIPHERAL ISCHAEMIA.
POSTERIOR TIBIAL COMPRESSION SIGNS
RETROMALLEOlar SIGN
PAIN – TENDERNESs
PARTIAL PARALYSIS.
I.V. – TOES T.C. D.C. DIFFERENCE
POSTERIOR TIBIAL NEUROVASCULAR
DECOMPRESSION AIMED AT
NERVE RECOVERY &
CORRECT VASCULAR INADEQUACY
THE IMMUNOLOGIST SAYS: "IT IS AN IMMUNOLOGICAL AND INFLAMMATORY PHENOMENA!"

THE SURGEON SEES AN ADDITIONAL MECHANICAL PHENOMENA:

HYPERTROPHIC NEURITIS IN THICKENED INEXTENSIBLE SHEATH

= INTERNAL COMPRESSION

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DEFINITIVE PARALYSES TREATMENT
SOME WEEKS MORE DO NOT MATTER!
TWO POSSIBILITIES:

- DRIVE PATIENTS TO A COMPETENT SURGEON, WHENEVER IT CAN BE DONE
- REGROUP PATIENTS AND ASK AN EXPERIENCED SURGEON TO COME DURING A LIMITED PERIOD OF TIME AND OPERATE THEM (E.G. SHORT DURATION MISSIONS OF FOLLEREAU FOUNDATIONS)
P.T. DECOMPRESSION.
EARLY OPERATION LEADS TO NERVE RECOVERY OR STOPPAGE FURTHER NERVE DAMAGE. CORRECTS VASCULAR INSUFFICIENCY.
## Duration of Paralysis & Result

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<tr>
<th>Duration</th>
<th>Result</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>Improved &amp; No Change</td>
<td></td>
</tr>
<tr>
<td>Up to 3 months</td>
<td>28</td>
<td></td>
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<tr>
<td>Over 3 months</td>
<td>15</td>
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<tr>
<td>Total</td>
<td>43</td>
<td></td>
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<tr>
<td></td>
<td>Nil Maintained &amp; Worse</td>
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<tr>
<td>Up to 3 months</td>
<td>8</td>
<td>36</td>
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<tr>
<td>Over 3 months</td>
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<td>28</td>
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<tr>
<td>Total</td>
<td>21</td>
<td>64</td>
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Difference significant: $P < 5\%$
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<tr>
<th>Type</th>
<th>Result</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>Improved &amp; No Change</td>
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<tr>
<td>Lepromatous</td>
<td>20</td>
<td>23</td>
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<tr>
<td>Non Lepromatous</td>
<td>23</td>
<td>41</td>
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<tr>
<td>Total</td>
<td>43</td>
<td>64</td>
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<tr>
<td>Difference</td>
<td>Significant P &lt; 1%</td>
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## Initial Nerve Function Grade & Recovery

<table>
<thead>
<tr>
<th>Nerve Function Grade</th>
<th>Total No.</th>
<th>No. Improved</th>
<th>% Improved</th>
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<tr>
<td>0</td>
<td>25</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>1</td>
<td>16</td>
<td>12</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
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<td>10</td>
<td>90</td>
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<tr>
<td>3</td>
<td>6</td>
<td>5</td>
<td>83</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>6</td>
<td>100</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>64</strong></td>
<td><strong>43</strong></td>
<td><strong>67</strong></td>
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<tr>
<td>NERVE FUNCTION STATUS</td>
<td>SENSORY STATUS</td>
<td>MOTOR STATUS</td>
<td>DEFORMITY STATUS</td>
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<tr>
<td>-----------------------</td>
<td>---------------</td>
<td>--------------</td>
<td>------------------</td>
</tr>
<tr>
<td>IMPROVED</td>
<td>32 (69%)</td>
<td>31 (80%)</td>
<td>27 (61%)</td>
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<tr>
<td>NO FURTHER DAMAGE</td>
<td>12 (69%)</td>
<td>20 (80%)</td>
<td>12 (61%)</td>
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<tr>
<td>NIL GRADE MAINTAINED</td>
<td>16</td>
<td>9</td>
<td>17</td>
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<tr>
<td>WORSENED</td>
<td>4</td>
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<td>8</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>64</strong></td>
<td><strong>64</strong></td>
<td><strong>64</strong></td>
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TODAY

WITH PROPER MEDICAL TREATMENT
NERVE SURGERY NEEDED INFREQUENTLY
MAINLY IN ABSCESS - ACUTE OR CHRONIC
AND WHEN MEDICAL TREATMENT FAILS