Efficacy of Early resistance protocol to hasten Grip strength recovery after Lasso surgery – a randomized control study

The Leprosy Mission Trust India
Introduction

• Claw hand deformity in leprosy leads to poor appearance and loss of function when untreated

• Tendon transfer surgery is done to restore hand function

• Grip strength is reduced during the immediate post operative therapy period

• The early introduction of resistance could minimize this reduction in grip strength.
Objectives

To determine the effect of early resistance exercises in restoring grip strength soon after lasso surgery procedure
Setting

- The Leprosy Mission Hospital, Naini, Allahabad, Uttar Pradesh, India.
- Tertiary referral center
- Over 2000 untreated Leprosy cases, each year
- 150 beds
- Computerized medical records since 2008
- Over 250 tendon transfer surgeries for hand each year
INCLUSION CRITERIA

- Patient with Flexor digitorum superficialis (FDS) Lasso surgery in 2011
- Age group of 20 to 50 years

SAMPLE SIZE

124 patients

Randomly assigned

Conventional therapy
(62 patients)

Early resistance therapy
(62 patients)
**ASSESSMENT TOOL**

*Jammar Dynamometer* is used to measure Grip strength

*Finger Goniometer* is used to measure the unassisted angles
Therapy protocol
3 weeks Immobilization for both groups followed by

1st week
- Metacarpophalangeal (MCP) Isolation Exercise

2nd week
- Grasp activities without resistance

3rd week
- Strengthening activities & Functional activities

Conventional therapy
- MCP Isolation exercise with resistance (Intrinsic strengthening tool)

Early resistance therapy
- Grasp activities with resistance
- Strengthening activities & Functional activities
Intrinsic strengthening tool
resistance is applied by elastic bands

Early resistance therapy follows the MCP isolation exercise—by using the intrinsic strengthening tool.

Courtesy: Luiz Fábio Machado Barbosa, Johanna Noordhoek, Federal University Hospital, Brazil, JHT Jan-March 2007
Results

Grip Strength

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Conventional therapy</th>
<th>Early resistance therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative</td>
<td>15.6</td>
<td>16.6</td>
</tr>
<tr>
<td>Immediate Post-op period</td>
<td>9.5</td>
<td>6.6</td>
</tr>
<tr>
<td>1st Follow up &lt;6 months</td>
<td>10.5</td>
<td>11.6</td>
</tr>
<tr>
<td>2nd Follow up 1-2 yrs</td>
<td>14.5</td>
<td>15</td>
</tr>
</tbody>
</table>

39% reduction
76% reduction

Conventional therapy: Early resistance therapy
Table shows the Mean & SD of the difference (between pre and post) of Grip strength

<table>
<thead>
<tr>
<th>Grip Strength</th>
<th>Group</th>
<th>N</th>
<th>Mean (Kg force)</th>
<th>SD</th>
<th>p-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conventional therapy</td>
<td>62</td>
<td>12.55</td>
<td>4.803</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Early resistance</td>
<td>62</td>
<td>6.00</td>
<td>3.098</td>
<td>0.0001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

- The mean and SD of the difference (between pre and post) of each variable is taken.
- Grip strength shows significant difference in both the groups.
Un-assisted angles

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Angle Value</th>
<th>Therapy Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Operative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate post-Op</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Follow up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Follow up</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Conventional therapy
- Early resistance therapy
Conclusion

Early resistance protocol is more effective in restoring grip strength during immediate post-operative therapy period as compared to conventional therapy and it is not expensive and there is no negative effect on transferred tendon.
Recommendations

The elastic resistance of the intrinsic strengthening tool should be measured and standardized.

Long term follow up of the patients should be done.
Acknowledgement

• We acknowledge the contribution of The Leprosy Mission, the leprosy affected and all the concerned staff who helped in this study.
THANK YOU...