Analysis of single heel raise and muscle power after repair of achilles tendon rupture

Department of Orthopaedic Surgery
Inje University College of Medicine
Ilsan Paik Hospital

Seong Mu Cha, M.D.
Ji Hoon Kim, M.D.
Jae Gwang Song, MD.
Kyung Ah Chun, M.D.
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My disclosure is in the Final AOFAS Program Book.
I have no potential conflicts with this presentation.
Purpose of Study

To evaluate the **timing of possible single heel raise (SHR)** and **isokinetic muscle power** after **achilles tendon repair**

To find **SHR can influence clinical outcome** of last follow up
Material and Methods

- Period: 2006.3 ~ 2011.6
- Operated in out hospital for achilles tendon rupture
- 39 cases (39 pts) of achilles tendon
- Mean age: 41.9(27-54)yrs
  - Male: Female = 29 : 10
  - Injury mechanism
    - 34 cases: sports related injury
    - 5 cases: slip down injury
  - Injury to operation, delayed time: mean 4days
Surgery protocol

- All patients were operated by one surgeon
- Medial longitudinal approach
- Krackow suture method
- End to end tendon repair

Protection protocol

- Short leg cast and tip toe walking for 4 weeks (with naturalequinous position)
- Boots prosthesis and full weight bearing
  (3 wedges were inserted at heel, then removed 1 by 1 weeks)
- POP 8 weeks, free walking without any prosthesis
Rehabilitation protocol

- Intermittent ROM exercise was done during boots prosthesis period
- Ankle strengthening exercise and stretching exercise were started at 8 weeks of POP (in our sports medicine center)

Medical Record Review

- Timing of capable SHR were checked
- SHR was defined as heel rise more than 2 finger breadth for seconds
Muscle Power Evaluation (POP 3 months)

- CYBEX770® system (CYBEX, USA)
- Ankle ROM exercise & warm up was done before test
- Isokinetic plantar flexion power were checked
- 30°/sec (represent peak torque, slow exercise)
- 120°/sec (represent running, jumping)

Clinical Evaluation (POP 12 months)

- AOFAS hindfoot score
- Arner-Lindhlom score
- Achilles tendon total rupture score (ATRS)
- Foot and ankle outcome score (FAOS)
Group by SHR

- Group 1: SHR was possible before 12 weeks (12 cases)
- Group 2: SHR was not possible before 12 weeks (27 cases)

Statistical Analysis

- Clinical Results and Muscle power
- Mann-Whitney U test by SPSS 18.0

Results (SHR)

- Timing of possible SHR:
  - mean 14 weeks + 3 days
  - (11 weeks + 4 days ~ 20 weeks + 4 days)
- Timing of repetitive SHR:
  - mean 20 weeks
  - (13 weeks + 1 day ~ 30 weeks + 2 days)
## Results

<table>
<thead>
<tr>
<th>Measure</th>
<th>Average</th>
<th>Group 1</th>
<th>Group 2</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOFAS score</td>
<td>90.7</td>
<td>93.2</td>
<td>89.6</td>
<td>0.408</td>
</tr>
<tr>
<td>Arner-Lindlhom score</td>
<td>1.2</td>
<td>1.4</td>
<td>0.271</td>
<td></td>
</tr>
<tr>
<td>ATRS</td>
<td>78.6</td>
<td>82.2</td>
<td>76.5</td>
<td>0.012</td>
</tr>
<tr>
<td>FAOS (DL)</td>
<td>83.2</td>
<td>86.9</td>
<td>81.5</td>
<td>0.012</td>
</tr>
<tr>
<td>FAOS (Sport&amp;Rec)</td>
<td>82.1</td>
<td>86.7</td>
<td>80.0</td>
<td>0.039</td>
</tr>
<tr>
<td>FAOS (QOL)</td>
<td>73.3</td>
<td>81.7</td>
<td>69.6</td>
<td>0.009</td>
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<tr>
<td>30°/sec Torque of plantar flexion</td>
<td>69</td>
<td>87.4</td>
<td>60.6</td>
<td>0.015</td>
</tr>
<tr>
<td>120°/sec Torque of plantar flexion</td>
<td>41</td>
<td>51.6</td>
<td>36.2</td>
<td>0.039</td>
</tr>
<tr>
<td>Power % compare with contralateral leg</td>
<td>69</td>
<td>77.8</td>
<td>65.1</td>
<td>0.020</td>
</tr>
</tbody>
</table>
Conclusions

- **SHR can be possible at mean about 14 weeks after achilles tendon repair**
- **Repetitive SHR can be done at mean 20 weeks**
- **The patients who were possible SHR before 12 weeks, have more good results (clinical & isokinetic test) than the others**
- **SHR can be a prognostic factor for achilles tendon repair during follow up**

Reference