The Effects of Voodoo Floss on Closed Chain Gastrocnemius Extensibility

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Introduction

• Restricted range of motion is an issue that athletes and recreationally active individuals may experience

• Range of motion may be restricted due to
  – inflammation or joint swelling
  – surgical hardware
  – muscle tightness
  – immobilization > 1 week¹
Ankle Dorsiflexion

• Commonly limited in healthy individuals and in patients recovering from lateral ankle sprain\(^2\)
• Affects daily activities such as walking, running, stair climbing and squatting\(^2, 3\)
• Research has found that decreased dorsiflexion range of motion contributed to higher risk of lateral ankle sprains and other lower limb injuries\(^4, 5\)
Voodoo Floss

- 7 foot long by 2 inch wide latex band
- Used by wrapping around joints and muscle bellies
- Looking to improve\(^6\)
  - range of motion
  - restore joint mechanics
  - unglue matted down or previously injured tissue
The purpose of this study was to explore the acute effects of the Voodoo Floss band on gastrocnemius length when compared to the control group.
Methods: Design
Randomized Control Study

**Independent Variables**
- Group
  - Voodoo floss group
  - Standard of care group
- Time
  - Pre and post measurements

**Dependent Variable**
- Gastrocnemius Length
Methods: Subjects

Inclusion Criteria
• Males and females
• 18-60 years old
• < 10° of DF ROM in open chain measure of the dominant leg

Exclusion Criteria
• Excessive gastrocnemius length of > 20°
• Loss of TCJ motion of < 20°
• Lower extremity injury within the past 6 months
• Open reduction internal fixation (ORIF)
• Allergy to latex material
• Open wounds/cuts
• Poor circulation (varicose veins, diabetes, DVT, PAD)
Methods: Instruments
Methods: Procedure

Subject Screening (informed consent form, general medical history questionnaire, inclusion/exclusion screen)

Baseline Measurements

Randomly Allocated

Voodoo Floss Intervention

Control Group

Post Intervention Measurements

Post Intervention Question
Screening

Open Chain Gastrocnemius Length

Open Chain Talocrural Joint Range of Motion
Closed Chain Measurement
Voodoo Floss Intervention
Closed Chain Measurement
Methods: Statistical Analysis

• Means and standard deviation were calculated
• A two-way mixed ANOVA was used to assess for CCDF differences between groups over time
  – Post hoc pairwise comparisons
• $\alpha$ level was $a priori$ at $p \leq 0.05$
# Descriptive Statistics

## Baseline Characteristics of Subjects

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects (N)</td>
<td>59</td>
</tr>
<tr>
<td>Male (n)</td>
<td>8</td>
</tr>
<tr>
<td>Female (n)</td>
<td>51</td>
</tr>
<tr>
<td>Age (y)</td>
<td>21.6 ± 3.5</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>166.2 ± 8.1</td>
</tr>
<tr>
<td>Mass (kg)</td>
<td>68.5 ± 12.5</td>
</tr>
</tbody>
</table>
Results: Dorsiflexion ROM

Average Pre Intervention | Average Post Intervention

Control | Voodoo
Results: Post Intervention Question #1

Do you feel the same, tighter, or looser than before the intervention?

- Same
- Tighter
- Looser

Subject Answer

- Control
- Voodoo
Results: Post Intervention Question #2

Do you feel as thought you gained motion?

- Yes: 80.00% Control, 90.00% Voodoo
- No: 10.00% Control, 0.00% Voodoo
Discussion

• Our results were not statistically significant despite seeing minor differences between the control and intervention group.

• Voodoo floss did not have a greater effect on closed chain dorsiflexion when compared to static stretching alone.
Discussion

• A change was seen in closed chain dorsiflexion over time
  – Average increase was 2° after 2 minute bout of stretching
  – Other studies looking at the effect of static stretching on ankle DF found small gains ranging from 2-5°\(^7-11\)

• Konor et al. found MDC for CCDF was 3.7°-3.8°\(^12\)
Discussion

• When asked the post intervention questions
  – A larger percentage of subjects in the Voodoo Floss group reported feeling looser afterwards
  – However, similar amount of subjects in both groups reported feeling as though they gained motion
  – Only a small number of subjects in both groups stated they felt the same or tighter after the intervention and felt they did not gain motion
Limitations

• Subjects’ pre-participation activities
• Subject population was not very broad
• Some subjects felt a strong stretch while others did not
• Static stretching alone may not have been effective
• Novice’s to using Voodoo Floss
Clinical Implications

Voodoo Floss alone did not show much increase in CCDF, but it was found to be a safe technique/tool to use that subjects preferred subjectively.
Future Research

• Use the band with active stretches and exercises
• Try using the band with multiple bouts
• Investigate the lasting effects of each intervention
References


Power Analysis

• Effect size = small (0.2 - 0.5)
• $\alpha = 0.05$
• $1 - \beta = 0.80$
• 60 healthy subjects
  – 30 subjects per group