Evidence Based Approach to the Use of Tissue Flossing Bands to Improve Perceived and Actual Range of Motion

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Thank you
PICO Question

- **Patients** – Subjects suffering from a decreased range
- **Intervention** – Tissue flossing with tissue flossing bands
- **Control** – Conventional treatment
- **Outcome** – Improved perceived and actual range of motion
Outline

• History of tissue flossing bands
• Potential modes of action
• Precautions
• The evidence behind flossing bands
• Anecdotal evidence
• Methods
• Conclusions
History of tissue flossing bands

- Relatively new modality

- Gained initial popularity in the weight lifting community
  - Improved muscle preparation for performance

- Evidence was largely anecdotal until recently
Potential modes of action

• Gate Control Theory

• Other neurological pathways

• Myofascial Release
Myofascial Release

- Began to develop as far back as the 1940’s

- First named in 1981

- Can be accomplished by manually mobilizing tissues or placing them on a stretch
Myofascial Release

• Current level of evidence ranges from low to high
  • Leads to difficulties in making conclusive statements

• Shows a lot of promise for clinical application
Potential modes of action

• Gate Control Theory

• Other neurological pathways

• Myofascial Release

• Blood reperfusion
Blood Flow Restriction

- Occludes venous blood flow while restricting arterial inflow
  - Application of some form of tourniquet

- Reduces oxygen delivery to muscle cells during exercise
Blood Flow Restriction

• Creates anaerobic environment

• May promote muscle hypertrophy
  • Initiating cell signaling
  • Hormonal changes
  • Preferential type II muscle fiber activation

• Safe treatment option
Precautions

• Can be uncomfortable
  • “Pinching” sensation
  • “Rope burn”

• Can leave temporary marks

• Cannot be used on patients with latex allergies
  • Band is 100% latex
Best available evidence
Borda J, Selhorst M, 2017

• Case Study

• 14-year-old female with chronic Achilles tendon pain

• Pain intensity decreased from 8/10 to 0/10 after two flossing band sessions
Cage, et al, 2018

- 21-year-old collegiate men’s basketball player
- X-ray and MRI revealed advanced Keinbock’s Disease
- Patient experiencing high levels of pain and dysfunction
Cage, et al, 2018
Cage, et al, 2018

- 6-weeks of tissue flossing treatments tiw in conjunction with therapeutic exercise.

- 88% decrease in pain from week 1 to week 6 as measured with VAS
  - p < 0.05

- 45% increase in function as measured using the Wrist/Hand Disability Index
  - p < 0.05
Driller, Overmayer, 2017

• Randomized controlled trial

• Showed significant improvements in:
  • Weightbearing lunge test
  • Ankle dorsiflexion
  • Ankle plantarflexion
  • Single leg vertical jump height
  • Single leg vertical jump velocity
Driller, et al, 2017

• Follow up from previous study

• Found that previous measures were maintained for at least 45 minutes
  • Points to tissue flossing not having a negative effect on muscle performance
Kiefer, et al, 2017

• Pilot study

• Examined effects of tissue flossing on actual and perceived range of motion at the glenohumeral joint

• No actual improvement in glenohumeral joint range of motion

• Significant improvement in perceived glenohumeral joint range of motion
PICO Question

- Patients – Subjects suffering from a decreased range
- Intervention – Tissue flossing with tissue flossing bands
- Control – Conventional treatment
- Outcome – Improved perceived and actual range of motion
What do you do when there is limited evidence?

• Make the most of the evidence that is available

• Remember that evidence based practice has three pillars
  • Best available evidence
  • Clinician expertise
  • Patient values

• Find your own evidence
What we’ve been working on
Pain & Dysfunction

- Controlled design study
- 20 collegiate baseball players
- Participated in upper body fatiguing protocol
- Threw 10 fastballs
- Received Flossing Treatment
- Threw 10 more fast balls
Pain & Dysfunction

• Pre- and post measures taken

• 27% decrease in pain as measured with the VAS
  • $p < 0.05$

• No significant difference in function as measured with Upper Extremity Functional Scale
  • Likely due to the fact that subjects were healthy and already at a high level of function.
Muscular Tenderness

• Controlled design study

• 13 collegiate baseball players

• 3 tenderness measurements taken using handheld algometer
  • Dominant and non-dominant forearms
Muscular Tenderness

• Single flossing band treatment performed to the dominant forearm

• Immediate retest of muscle tenderness for both the dominant and non-dominant forearm

• Significant differences muscle tenderness along medial and lateral aspects
  • Medial = 4.83 ± 2.44 vs. 0.79 ± 1.59
  • Lateral = 3.03 ± 2.39 vs. 0.41 ± 1.89
  • p < 0.001
Grip Strength

• Controlled design study

• 20 collegiate baseball players

• Baseline grip strength tested for dominant and non-dominant hand 3 times
Grip Strength
Grip Strength

• Controlled design study

• 20 collegiate baseball players

• Baseline grip strength tested for dominant and non-dominant hand 3 times

• Single tissue flossing band treatment to the dominant forearm followed by retests
Grip Strength
Grip Strength

• 4.3% decrease in strength in the dominant hand
  • $p = 0.001$

• No significant difference between dominant and non-dominant hand
  • $p = 0.143$
Anecdotal Evidence

• Initially introduced at UT Tyler with baseball pitchers

• Effective for decreasing pain and muscle and joint stiffness

• Some pitchers reported decreased accuracy with pitches
  • Used primarily on off days
Methods

• Indications
  • Musculoskeletal pain
  • Muscular tightness
  • Myofascial adhesions
  • Decrease joint range of motion related to muscle or joint stiffness
Methods

• Contraindications
  • Latex allergy
  • Open wounds
  • Conditions affecting circulation
  • Conditions affecting sensation
Methods

• Make sure your patient is NOT ALLERGIC to LATEX

• Prescreen the tissues
  • Feel for adhesions, tightness, and tension
  • Ask patient about tender areas
Methods

• Apply distal to proximal

• First session apply ~50% tension
  • Can increase tension as patient tolerance increases

• Take patient through brief bout of exercise
  • Do not exceed 3 minutes
Methods

• Remove band

• Scan tissues again

• Solicit patient feedback

• Repeat again if necessary
Conclusions

• Tissue flossing is continuing to increase in popularity

• Further research needs to be conducted

• Tissue flossing is a safe and potentially effective alternative modality to decrease pain and increase perceived and actual range of motion
Quiz Time
Question 1

• Which of the following is NOT a contraindications for tissue flossing bands?
  • Muscular Tightness
  • Acute Muscle Strain
  • Latex Allergy
  • Open Wound
Question 1

Which of the following is NOT a contraindications for tissue flossing bands?

- Muscular Tightness
- Acute Muscle Strain
- Latex Allergy
- Open Wound
Question 2

• True/False: There is evidence to support that tissue flossing bands can positively affect actual ankle dorsiflexion.
Question 2

• True/False: There is evidence to support that tissue flossing bands can positively affect actual ankle dorsiflexion.
Question 3

• True/False: There is evidence to support that tissue flossing bands can positively affect perceived ankle dorsiflexion.
Question 3

• True/False: There is evidence to support that tissue flossing bands can positively affect perceived ankle dorsiflexion.
Question 4

• True/False: Tissue flossing bands should be applied in a distal to proximal fashion.
Question 4

- True/False: Tissue flossing bands should be applied in a distal to proximal fashion.
Question 5

• For an initial treatment, tissue flossing bands should be applied with approximately ___ percent tension.
  • 25
  • 50
  • 75
  • 100
Question 5

- For an initial treatment, tissue flossing bands should be applied with approximately ___ percent tension.
  - 25
  - **50**
  - 75
  - 100
References


Questions