The Effects Of Splinting On Functional Independence For Adults With Dupuytren's Contracture: A Systematic Review

Leahmay Castillo, OTS, Layne Foster, OTS, Jeanette Guzman-Machado, OTS, Sarah Wong, OTS
Hawai'i Pacific University, Doctor of Occupational Therapy Program, Honolulu, Hawai'i

HAWAI'I PACIFIC UNIVERSITY
Doctor of Occupational Therapy

Condition

- Dupuytren's contracture (DC) is a fibroproliferative disorder of palmar fascia that causes flexion contractures of one or more digits (Kitridis et al., 2018)
- Dupuytren's Contracture is genetic.
  - It is often inherited in an autosomal fashion but most commonly seen with multifactorial etiology.
- The mechanism is still unknown, but may be linked to smoking, alcoholism, diabetes, nutritional deficiencies, or epileptic medications.
  - There is no clear link to occupation and activities being risk factors.
- Signs/Symptoms include:
  - Not being able to lay hand flat on table with palm down
  - One or more small nodules in the palm
  - Nodules thicken/tighten, cause thick bands of tissue under skin
  - Pits or grooves in the skin compressed by contracture
  - Fingers are pulled forward toward the palm
- Precautions:
  - Avoid gripping things too tightly or holding a static position for a long period of time
  - Repetitive trauma
  - Stop drug and alcohol use
  - Be aware of changes in hand function or tightening of palm/fingers

Evidence-Based Interventions & HEP

The following interventions were selected due to the post-operative protocols followed in the studies by Jerosch-Herold et al. (2011), Kitridis et al. (2018), and Tam et al. (2016).

Finger Extension with Band Video Example

Dupuytren's Contracture Home Exercise Program (HEP) Example

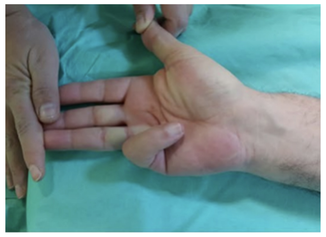
Scar Mobility Instructions

OT Assessments/Special Tests

- Quick DASH or DASH
- Dynamometer for grip strength
- Goniometer for AROM/PROM of MCP, PIP, DIP joints extension

Research Question

Does splinting promote increased functional hand independence in middle-aged adults with Dupuytren's Contracture?



Dupuytren's Contracture at Digit 5 with PIP flexion, (Kitridis et al. 2019)

Post-Operative Dorsal Digit Extension Splint, (Giesberts et al., 2020)

Pits/Groove compressed by Dupuytren's Contracture, (Johns Hopkins Medicine, 2024)

Post-Operative Volar Digit Extension Splint, (Hand Therapy Group, 2024)

Orthotics

Splints: These are custom-made or prefabricated devices worn on the hand or fingers to stretch and straighten contracted tissues over time

Night Splints: Designed to be worn during sleep, these splints maintain a prolonged stretch on the affected fingers to prevent further contracture and promote tissue relaxation

Finger Extension Splints: Specifically designed to extend and straighten fingers affected by Dupuytren's contracture, helping to maintain or improve finger mobility

Hand Orthosis: Custom-fitted devices that support the hand and fingers while allowing for functional use, preventing contractures and promoting optimal hand positioning and function

References

Physical Agent Modalities (PAMS)

- Heat Therapy - This helps increase blood flow, reduces pain, and can improve flexibility in the affected joint or tissue
- Ultrasound - Can be used to promote tissue recovery and can increase extensibility of collagen tissues. It may promote benefits when used alongside other modalities.
- Stretching - This helps maintain or improve joint flexibility and range of motion. It can also assist with slowing the progression of the condition and improve function over time.
- Massage - This modality can help by promoting circulation and reducing tissue adhesion. Massaging the area can improve flexibility, reduce pain, and promote recovery alongside other interventions.

Method

- This systematic review included five studies that contained relevant information regarding splinting to promote increased functional outcomes with range of motion and recurrence in individuals with Dupuytren's Contracture.
- A literature search was conducted with the following criteria: published within the last ten years (2014-2024), peer-reviewed, and focused on splinting as a post-operative intervention with adults. We searched for articles from the following databases: PubMed, EBSCO, Cochrane, CINAHL.

Results

All five studies provided evidence that night splinting is effective in maintaining range of motion gained through surgery. Outcome measures included patient-report and range of motion (ROM) measurements. Evidence demonstrates that night splinting does not increase the total range of motion when compared to adults who did not receive splinting. Splinting decreases the recurrence rate of Dupuytren's Contracture.

Discussion & Implications for OT Practice

- Splinting for Dupuytren's Contracture is effective to maintain range of motion and decrease recurrence but does not enhance the total ROM of the affected digit.
- OTs can provide custom splinting to increase the comfort of patients with Dupuytren's Contracture.
- Splinting should be implemented with occupation-based interventions to promote independence with ADLs and IADLs.
- More research is needed to understand the efficacy of splinting and the most effective protocol/intervention when used in practice (e.g., timeline, duration, etc.)