Joint Stability and Proprioception Training to Reduce Chronic Pain for a Female Patient with Hypermobile Ehlers-Danlos Syndrome: A Case Report

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Background

- **Ehlers-Danlos Syndrome (EDS)** is a heritable connective tissue disorder with many subtypes.1
- **Hypermobile EDS (hEDS)**, the most common subtype, is characterized by generalized joint hypermobility, musculoskeletal impairments, systemic involvement, and a familial history of EDS.1
- Due to the many subtypes of EDS, and general hypermobility, a categorization of all terms was created called the Hypermobility Spectrum Disorder.1,2
- Patients present with physical, psychological, and central nervous system impairments reducing their quality of life (QoL).3

**Purpose**

The purpose of this case report was to describe the interventions utilized for a 28-year-old female with hEDS and chronic pain with the intention of reducing symptoms and promoting return to work.

**Case Description**

- Patient was a 28-year-old Caucasian female, married with no children, unemployed as a carpenter at time of initial eval.
- Right knee injury with no mechanism of injury noted in high school
- Surgery of right knee due to persistent pain, revealed a meniscal tear
- Chronic overuse symptoms in bilateral elbows due to high school job and most recent employment
- "New" neck pain with numbness and tingling down her right arm that incurred most recently before initial eval
- Neck, elbow, and knee pain limiting her physical activity
- Suspected EDS diagnosis in relation to her pain

**Procedure**

**Diagnostic Screen:** EDS > POTS > MCAD

**Physical Therapy Examination**

**Creation of POC and Interventions**

**Evaluation Procedure**

**Procedural Intervention Categories**

- **Strengthening:**
  - Musculature to improve functionality and joint stability
  - Core, Hip, Rotator cuff, intercostal mm

- **Proprioception Training**

- **Postural Retraining**

- **Motor Control Reeducation**

- **Training of postural musculature to improve joint alignment and reduce pain with movement
- DNF, GH glides**

- **改善 normal functioning of muscle activity within normal movement patterns
- Self METs, Foot intrinsics**

**Outcomes**

**Test & Measure**

- **Initial Evaluation**
- **Final Evaluation**

**Figure 1. Hypermobility Spectrum Disorder**

<table>
<thead>
<tr>
<th>Procedural Intervention Categories</th>
<th>Cervical ROM</th>
<th>Hip MMT</th>
<th>Knee MMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion:</td>
<td>45°</td>
<td>45°</td>
<td>45°</td>
</tr>
<tr>
<td>Extension:</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
</tr>
<tr>
<td>Adduction:</td>
<td>5°</td>
<td>5°</td>
<td>5°</td>
</tr>
<tr>
<td>Abduction:</td>
<td>5°</td>
<td>5°</td>
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<tr>
<td>External Rotation:</td>
<td>5°</td>
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<td>5°</td>
</tr>
<tr>
<td>Internal Rotation:</td>
<td>5°</td>
<td>5°</td>
<td>5°</td>
</tr>
<tr>
<td>Knee flexion: 0-30°</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
</tr>
<tr>
<td>Standing knee flexion: 0-30°</td>
<td>30°</td>
<td>30°</td>
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</tr>
</tbody>
</table>

**Figure 2. Strengthening**

- Intercostal strengthening by rib expansion with resistance band

**Figure 3. Postural Retraining**

- Glenohumeral posterior glide with ball

**Figure 4. Proprioception Training**

- Drinking Bird

**Figure 5A. Motor Control Reeducation**

- Pelvic balance: Self MET with contralateral hip flexion and extension

**Figure 6. Proprioception Testing Outcome**

**Figure 6: Red line represents targeted 30° of knee flexion the patient is trying to achieve with eyes closed during proprioception testing.

**Conclusion**

- The patient demonstrated improvement in strength, pain, proprioception, range of motion, and functional mobility.
- Graded strengthening, postural retraining, proprioception training, and motor control reeducation were shown to be the most effective way to address symptoms.
- More research needs to be conducted on specific physical therapy interventions for EDS patients to improve their QoL and function.

**Acknowledgments**

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**References**

2. Hypermobile EDS, the Most Common Subtype. 2023. Available at: [Link](https://example.com/heds).