INTRODUCTION

- For a physical therapy student completing a clinical internship, one quickly learns that not all patients present as perfectly as they do in the textbooks. This case report highlights the clinical decision making to navigate such a patient and the various interventions used to reduce pain, increase range of motion and help the patient return to functional activities following a complex knee injury.
- Knee sprains and strains are among the most common diagnosis and the highest injury rate was amongst those age 15 to 24 years of age.
- 20% involved the anterior cruciate ligament
- 10.8% involved the meniscus
- 7.9% involved the medial collateral ligament
- 3.7% involved the lateral meniscus
- 0.65% involved the posterior cruciate ligament
- Multiple Ligament Knee Injuries occur at a rate of 0.072 per 100,000 patients.
- The most common activity resulting in these injuries was soccer
- The purpose of this case report is to provide the clinical decision making process from a student physical therapist’s perspective in managing a patient with multiple knee ligament injuries to help improve knee mobility.

CASE DESCRIPTION

- The patient was a 21-year-old male who sustained a multiple ligament knee injury while playing soccer
- Pt presented to physical therapy 9 days post operatively with significant swelling to knee joint causing decreased range of motion and pain on movement.
- Chief complaints were dull ache in right knee, limited range of motion with stiffness and pain, generalized weakness of right knee and hip as well as inability to walk or stand independently which prevented him from returning to work as a cook.
- His knee range of motion at evaluation was 89/90 degrees AROM/PROM knee flexion and -100 degrees AROM/PROM knee extension. He also presented with R knee hypomobility of the tibiofemoral joint and quadriceps/hamstring weakness.
- The patient did not have formal therapy prior to surgery and he did not present with expected range of motion post operatively.
- See Tables 1-4 for initial visit objective data regarding A/PROM, strength and Lower Extremity Functional Scale outcome measures.

PLAN OF CARE

- Physical therapy management included joint mobilizations, patella mobilizations, contract/relax techniques, manual stretching and low load long duration stretches in order to improve knee mobility.
- Isometric and isotonic exercises focused on increasing quadriceps activation and hip strength.
- Balance and gait training was provided to improve functional mobility. Modalities were also used for palliative care.
- Treatment was aimed at improving knee mobility and stability with the use of joint mobilization, passive stretching and strengthening.

OUTCOMES

- The patient demonstrated improvements in knee range of motion, strength, flexibility, pain, gait and Lower Extremity Functional Scale (LEFS).
- At discharge, patient reported no pain.
- Knee flexion improved from 89 degrees to 127 degrees and knee extension improved from -10 degrees to 0 degrees.
- Patient had fluctuations in range of motion throughout treatment but overall showed improved mobility gains in active/passive range of motion, joint mobility and muscle length.

Table 1. AROM Post Treatment

<table>
<thead>
<tr>
<th>Knee Flexion</th>
<th>Knee Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1 (Visit 2-4)</td>
<td>89 deg</td>
</tr>
<tr>
<td>Week 2 (Visit 5-7)</td>
<td>100 deg</td>
</tr>
<tr>
<td>Week 3 (Visit 8)</td>
<td>110 deg</td>
</tr>
<tr>
<td>Week 3 (Visit 9)</td>
<td>112 deg</td>
</tr>
<tr>
<td>Week 4 (Visit 10)</td>
<td>118 deg</td>
</tr>
<tr>
<td>Week 4 (Visit 11)</td>
<td>122 deg</td>
</tr>
<tr>
<td>Week 4 (Visit 12)</td>
<td>127 deg</td>
</tr>
</tbody>
</table>

Table 2. Knee Range of Motion

<table>
<thead>
<tr>
<th>Flexion A/PROM</th>
<th>Extension A/PROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Visit</td>
<td>89/90 degrees</td>
</tr>
<tr>
<td>Discharge</td>
<td>127/129 degrees</td>
</tr>
</tbody>
</table>

Table 3. Muscle Strength

<table>
<thead>
<tr>
<th>Knee Flexion</th>
<th>Knee Extension</th>
<th>Hip Flexion</th>
<th>Hip Extension</th>
<th>Hip Abduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Visit</td>
<td>4/5</td>
<td>5/5</td>
<td>4+5</td>
<td>4/5</td>
</tr>
<tr>
<td>Discharge</td>
<td>5/5</td>
<td>5/5</td>
<td>4/5</td>
<td>4/5</td>
</tr>
</tbody>
</table>

Table 4. Lower Extremity Functional Scale

<table>
<thead>
<tr>
<th>Initial Visit</th>
<th>Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>25/80</td>
<td>43/80</td>
</tr>
</tbody>
</table>

CONCLUSION

- This patient case required significant clinical reasoning and monitoring which proved challenging for a student physical therapist.
- Patient responded positively to a combination of knee mobility interventions with the most gains occurring after included, contract-relax to hip flexors, joint mobilizations to tibiofemoral joint, tuck and stretch techniques to hamstrings and low load long duration stretch to hamstrings.
- At discharge patient demonstrated reduction in pain, increased knee ROM and improvement in function.
- Evidence is lacking in physical therapy management of multiple ligament knee injuries. Well-researched and established protocols should be used for guidelines.
- It is important for the SPT to complete test/retest following each intervention to assess for tissue response in order to progress patient appropriately.
- This case report demonstrates the clinical reasoning of a student physical therapist treating a complex case for a multiple ligament knee injury. The test/retest clinical reasoning methodology was shown to be successful at finding the most effective strategy to improve ROM and function for this patient.

REFERENCES


ACKNOWLEDGEMENTS

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