Use of posterior tibial support braces for posterior cruciate ligament injury treatment; patients' perspective

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Background

Knee braces for static and dynamic posterior tibial support (PTS) are used in non-operative treatment of acute injury to the posterior cruciate ligament (PCL). Typically, the braces are used for a longer period requiring optimal patient compliance.

Patients’ perceptions on possible physical, psychological and social challenges associated with the use of PTS braces have not been described in the existing literature.

Aim

To describe patient-reported problems associated with use of either static or dynamic PTS braces.
Materials and methods

• A prospective and descriptive cohort study of 54 consecutively enrolled patients undergoing non-operative treatment of acute injury to the PCL.

• Data were collected from a non-validated questionnaire designed on the basis of data from semi-structured patient interviews and including questions on skin disorders, problems with odor, choice of clothes and influence on sleep.

• Data were collected after eight weeks of continuous use of either a static brace (SB) or a dynamic brace (DB).
<table>
<thead>
<tr>
<th>Type of PTS brace</th>
<th>Sex</th>
<th>Age</th>
<th>Days from injury to start of treatment with PTS brace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic PTS brace group</td>
<td>10 men/10 women</td>
<td>35 years (15-61 years)</td>
<td>25 days (7-77 days)</td>
</tr>
<tr>
<td>Static PTS brace group</td>
<td>25 men/9 women</td>
<td>34 years (16-35 years)</td>
<td>22 days (3-64 days)</td>
</tr>
</tbody>
</table>
Static and dynamic braces

- **The static brace** (PCL Jack Brace, Albrecht, Stephanskirchen, Germany) applies a static anterior directed force on the proximal tibia to counteract the posterior sag of the tibia. The level of force can be manually adjusted.

- **The dynamic brace** (Rebound PCL, Össur Inc., Foothill Ranch, CA, USA) applies forces to the posterior proximal tibia that dynamically increases with increased flexion angles through a tensioned cable and pulley system.
The four main questions

• Did you experience skin disorders in the period when you had to wear the brace? If yes – what type of skin disorders did you experience?
  A: Excoriations
  B: Rashes
  C: Wounds
  D: Other - Describe other: ______________________

• Did you experience problems with bad odor during the eight weeks you had to wear the brace?  A: Yes
  B: No

• Did the brace have any negative influence on your sleep?  A: Yes
  B: No

• Did the brace have any negative impact on your choice of clothes?
  A: Yes
  B: No
Results
Patient reported problems

- Skin disorders: 0.65 (Dynamic), 0.71 (Static)
- Odor problems: 0.6 (Dynamic), 0.53 (Static)
- Choice of clothes: 0.95 (Dynamic), 0.97 (Static)
- Influence on sleep: 0.8 (Dynamic), 0.76 (Static)

Legend:
- Blue: Dynamic PCL brace
- Red: Static PCL brace
Conclusions

PTS bracing of patients with acute injury to the PCL undergoing non-operative treatment is highly associated with challenges related to problems with the skin, odor, sleep and choice of clothes.

Type of brace, static or dynamic, had little influence on challenges associated with brace treatment.
Significance for clinical practice

The present data suggests the need to inform patients undergoing nonoperative treatment with PTS braces about the reported typical challenges and make sure that they know where to seek help and advice if necessary.

To minimize skin disorders as excoriations and wounds, it is important to measure the patients leg for the right size of brace and make sure the brace is well padded.

It underpins the need for regular follow ups in the clinic in order to adjust the fitting of the brace, secure the skin and change the lining of the brace when necessary.
LaPrade R. et al., ”Quantification of functional brace forces for posterior cruciate ligament injuries on the knee joint: an in vivo investigation”. KSSTA 2014

Jansson K et al., ”A historical perspective of PCL bracing” KSSTA 2012

Pierce et al., ”Posterior cruciate ligament tears: functional and postoperative rehabilitation” KSSTA 2012