The Air-Stirrup brace with elastic wrap improved function in first incident grade 1 or 2 lateral ankle ligament sprain

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In patients with first incident grade 1, 2, or 3 lateral ankle ligament sprain, how do different treatments compare?

**METHODS**

- **Design:** randomised controlled trial.
- **Allocation:** (allocation concealed)†
- **Blinding:** (unblinded)†
- **Follow up period:** 21 days or until recovery.
- **Setting:** sports medicine clinic at the University of Vermont, USA.
- **Patients:** 212 patients 16–61 years of age without congenital or degenerative conditions and presenting to the sports medicine clinic within 72 hours of an initial ankle injury. Patients were classified by severity of ankle injury—grade 1 (n = 64), 2 (n = 116), or 3 (n = 32)—and then randomised to treatment groups. Exclusion criteria were abnormal gait before injury, previous ankle sprain, current or previous ankle fracture, syndesmosis injury, burns, lacerations, puncture wounds, open tibial epiphyses, chronic illness, metabolic or neurological disease, pregnancy, or unwillingness to adhere to therapy.
- **Intervention:** grade 1 patients were allocated to (i) elastic wrap (EW) (Ace), (ii) Air-Stirrup (AS) ankle brace (Aircast Inc, Summit, NJ, USA), or (iii) both EW plus AS. Grade 2 patients were allocated to all grade 1 interventions or fibreglass cast for 10 days followed by EW. Grade 3 patients were allocated to AS or cast. All patients were also given instructions for a standardised home rehabilitation programme, which included swelling control and protection from reinjury. Patients should have relative rest for the first 24–48 hours. Ice should be used with elevation to reduce swelling and pain. Exercises to restore full range of motion and strength should begin after 48 hours.‡

**MAIN RESULTS**

**Grade 1.** The AS plus EW group returned to normal walking and stair climbing sooner than the AS or EW groups (table). Grade 2. The AS plus EW group returned to normal walking and stair climbing sooner than the cast group (table). Grade 3. The AS and cast groups did not differ for any outcome (table).

**OUTCOMES**

<table>
<thead>
<tr>
<th>Outcomes at 21 days or recovery</th>
<th>Sprain</th>
<th>AS+ EW</th>
<th>AS</th>
<th>EW</th>
<th>Cast</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean time to normal walking (d)</td>
<td>1 4.6 10 – – 0.0008</td>
<td>1 4.6 – 11 0.004</td>
<td>2 10 – 24 0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean time to normal stair climbing (d)</td>
<td>3 – 19 – 0.0001</td>
<td>3 – 18 – 21 0.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*AS = Air-Stirrup; EW = elastic wrap.

**CONCLUSIONS**

In patients with first incident grade 1 or 2 lateral ankle ligament sprain, the Air-Stirrup brace with elastic wrap improved function more quickly than the brace or wrap alone or cast. For grade 3 sprains, the Air-Stirrup brace and cast did not differ.

**Commentary**

Lateral ankle sprains are commonly seen acute injuries in primary care clinics and emergency departments and account for 20% of sports injuries in the US. A recent meta-analysis evaluated various braces including “lace up” and “semi rigid,” both of which showed superiority in recovery time when compared with an elastic bandage alone.‡ Taping was the least effective as well as more expensive treatment.

The study by Beynnon et al and funded by Aircast evaluated the Aircast AS ankle brace that allows active movement while protecting from ankle inversion. The patients were relatively young and either attended 1 of several settings, including university affiliated emergency departments or health clinics, or were referred by athletic trainers within 72 hours of their first time ankle injury. In patients who had grade I or II tears, recovery was fastest with a combined ankle brace and wrap, the ankle brace and cast groups did not differ in patients who had grade III tears. At 6 months follow up, treatment groups for any grade tear did not differ for the tertiary outcome. There was a 19% dropout rate in the study, and Beynnon et al did not specify what happened to those patients. Current practice recommendations are that initial treatment of a mild to moderate lateral ankle sprain should include decreasing pain and swelling and protection from reinjury. Patients should have relative rest for the first 24–48 hours. Ice should be used with elevation to reduce swelling and pain. Exercises to restore full range of motion and strength should begin after 48 hours.‡ Application of both a splint brace and an elastic wrap to maintain compression with activity appears to speed up healing.

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† See glossary.
‡ Information provided by author.