Validation of the Foot and Ankle Outcome Score for Hallux Valgus

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Summary
Patient-reported outcome questionnaires like the Foot and Ankle Outcome Score are useful in evaluating results after orthopedic interventions. The FAOS is validated for lateral ankle reconstruction (1), but not for common forefoot pathology. In hallux valgus (HV) patients, we show acceptable construct validity of the FAOS when compared to the SF36, a widely validated outcome. Content validity of specific FAOS questions as it applies to HV patients is questioned. Test-retest reliability and responsiveness of FAOS is also confirmed.

Introduction
The Foot and Ankle Outcome Score is a patient-reported outcome frequently used in the literature, however, its validity has not been established for forefoot disorders. Our study aimed to validate the FAOS for use in assessing forefoot disorders, specifically hallux valgus (HV).

Methods
From 2006-2009, 195 patients from the HSS foot and ankle registry with the diagnosis of non-arthritic HV were included in the study. Each patient had both a SF36v1/v2 and FAOS administered at the same time-point. Moderate correlation coefficients (0.4 to 0.7) indicate acceptable construct validity (2) between subscales of the FAOS and SF36. Forty additional HV patients, identified by ICD9 search, were given questionnaires to assess the relevance of each FAOS question as it pertained to their bunion. Questions were scored as 1 (not relevant), 2 (somewhat relevant), or 3 (very relevant). Acceptable content validity was a relevance score of 2 or more. Reliability was assessed with thirty-three HV patients, also identified by ICD9 search, who were administered a second FAOS one month after the first. An intra-class correlation coefficient (ICC) above 0.7 (3) indicated acceptable test-retest reliability. Responsiveness of the FAOS was assessed with forty patients with both pre-operative and post-operative FAOS.

Results
The FAOS pain, activities of daily living (ADL), sports, and foot/ankle quality of life (QOL) subscales all demonstrated moderate Pearson’s correlation coefficients of 0.45 or greater (Table 1). Patients rated the QOL questions of the FAOS as having the highest relevance (relevance score 2.31, range 1-3) while the symptoms and ADL subscales were less relevant (relevance score 1.56 and 1.62). All items of the QOL subscale were considered as being at least of some importance by more than 69% of the patients (range 69% to 97%). The FAOS symptoms, ADL, QOL, and sports subscales achieved acceptable test-retest reliability intra-class correlation coefficients of 0.77, 0.89, 0.91, and 0.85 respectively, while pain had a correlation of 0.76. Four subscales of the FAOS (pain, symptoms, ADL, QOL) showed statistically significant differences between the pre-operative and post-operative groups (p-value<0.5). The sports subscale was the least responsive and did not change between the two groups.

Conclusions
Acceptable construct validity was achieved for 4/5 FAOS subscales when compared with the SF36. The symptoms subscale did not achieve adequate correlation with the SF36 subscales. The FAOS questions are foot-specific and not reflected in a generalized SF36 outcome. The relevance of specific subscales of the FAOS as it pertains to HV is questioned. FAOS further demonstrates good internal reliability and responsiveness, indicating that it is a valuable outcome tool in the assessment of hallux valgus patients.
1. Roos EM, Brandsson S, Karlsson J. Validation of the FAOS for ankle ligament reconstruction. FAI 2001

<table>
<thead>
<tr>
<th>SF36</th>
<th>FAOS</th>
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<tbody>
<tr>
<td>Physical Functioning</td>
<td>0.612 Pain</td>
</tr>
<tr>
<td>Limitation - Physical Health (RP)</td>
<td>0.467 Pain</td>
</tr>
<tr>
<td>Bodily Pain</td>
<td>0.638 Physical Functioning</td>
</tr>
<tr>
<td>Physical Component Score</td>
<td>0.634 Physical Functioning</td>
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