Diagnostic Accuracy of Clinical Examination Measures for Pathology of the Distal Biceps Brachii Tendon Unit: A Systematic Review with Meta-Analysis

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Background
- Patient outcomes are improved after early diagnosis and management of distal biceps brachii tendon unit injury.
- It is imperative to consider the clinical utility of measures used for this diagnosis to make a prompt and accurate assessment.
- A comprehensive summary of all clinical measures for diagnosis of distal biceps brachii tendon unit pathology does not currently exist.

Objective
- Evaluate and summarize the current diagnostic accuracy of clinical examination measures for distal biceps brachii tendon unit pathology.

Methods
- A computer-assisted literature search of PubMed, CINAHL, and EMBASE databases was performed in January 2014.
- Search terms were combined to include physical examination, distal biceps tendon injury, and diagnostic properties.
- Quality of studies was assessed using the QUADAS-2 tool.
- Meta-analysis was utilized to create pooled sensitivity, specificity, and positive/negative likelihood ratios with their 95% confidence intervals.

1088 articles found through PubMed, CINAHL, and EMBASE
319 abstracts screened following a title screen
33 full-text articles screened
8 studies included in the systematic review
5 studies included in Meta-Analysis

Clinical Measures
- Biceps Squeeze Test
- Bicipital Aponeurosis Flex Test
- Direct Radial Tuberosity Compression Test
- Passive Forearm Pronation (PFP) Test
- Biceps Crease Interval (BCI)
- Hook Test

Diagnostic Results

<table>
<thead>
<tr>
<th>Diagnostic Accuracy of Clinical Measures [Single Studies]</th>
<th>Best Screening Tests</th>
<th>LR+</th>
<th>Risk Of Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Radial Tuberosity Compression Test</td>
<td>0.96</td>
<td>0.02</td>
<td>Low</td>
</tr>
<tr>
<td>Hook Test</td>
<td>0.79-0.99</td>
<td>0.02-0.28</td>
<td>Low to High</td>
</tr>
<tr>
<td>Biceps Squeeze Test</td>
<td>0.96</td>
<td>0.03</td>
<td>Low</td>
</tr>
<tr>
<td>Best Diagnostic Tests</td>
<td>SP</td>
<td>LR+</td>
<td>Risk Of Bias</td>
</tr>
<tr>
<td>Direct Radial Tuberosity Compression Test</td>
<td>0.96</td>
<td>49</td>
<td>Low</td>
</tr>
<tr>
<td>Hook Test</td>
<td>0.75-0.96</td>
<td>3.18-25.62</td>
<td>Low to High</td>
</tr>
<tr>
<td>Biceps Crease Interval (BCI)</td>
<td>0.75-0.96</td>
<td>3.41-41.25</td>
<td>High</td>
</tr>
</tbody>
</table>

Conclusions
- Clinical measures were typically only performed on individuals with suspected pathology.
- The clinical measure with the strongest diagnostic accuracy in a single, low-bias study is the direct radial tuberosity compression test.
- Meta-analysis results suggest strong diagnostic accuracy for the passive forearm pronation test.

Clinical Relevance
- Combining clinical measures improved diagnostic accuracy.
- The diagnostic cluster of BCI, PFP, and Hook tests appears to be the most practical for the practicing clinician.
- These clinical measures are best used in acute cases of suspected distal biceps brachii tendon unit pathology.
- Future high-quality research is suggested to enhance the diagnostic ability of these clinical measures and to elucidate their utility in conjunction with a comprehensive clinical examination.

References
- Available upon request.