Pectus Index: a novel marker for the clinical severity of pectus carinatum deformity

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Radiological Haller

CT image B demonstrating the Haller index: “the measurement of the internal transverse diameter of the thorax on the inside of the rib cage, divided by the shortest anteroposterior depth from the internal aspect of the sternum of the anterior cortex of the nearest vertebral body.”

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Technique: physical measurements
Technique: calculation

Where $M$ is the width of the chest wall (medio-lateral) in centimetres at the level of the nipples and $AP$ is the depth of the chest wall (antero-posterior) between the spine and anterior chest wall at the level of the pectoral peak.
Comparison with clinician’s assessment
Development - Use of 3D topographic Scanner

Conventional MRI

Topographic scan using handheld 3D scanner allows precise measurements to be taken
## Table 1

<table>
<thead>
<tr>
<th>Clinical Severity</th>
<th>n</th>
<th>Coefficient</th>
<th>P</th>
<th>95% LCI</th>
<th>95% UCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>6</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Moderate</td>
<td>55</td>
<td>-0.104</td>
<td>0.022</td>
<td>-0.192</td>
<td>-0.015</td>
</tr>
<tr>
<td>Severe</td>
<td>81</td>
<td>-0.217</td>
<td>0.000</td>
<td>-0.305</td>
<td>-0.130</td>
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<tr>
<td>Extreme</td>
<td>2</td>
<td>-0.265</td>
<td>0.002</td>
<td>-0.434</td>
<td>-0.097</td>
</tr>
</tbody>
</table>
Pectus Index

- Mild: Pectus index >1.29
- Moderate: Pectus index 1.28-1.18
- Severe: Pectus index 1.17-1.02
- Extreme: Pectus index <1.02

More ROUND chest dimensions
More OVAL chest dimensions
Applications

Cheap and easy adjunct to clinical assessment

Objective tool to enable comparison of results

Reproducible result for monitoring of progress with treatment