Two-Dimensional Strain Imaging: Angle Independence in Assessment of Myocardial Performance

Julius Golender [1], Zeev Perles [1], Sagui Gavri [1], Nael El-Laham [1], Asaf Ta-Shma [2], Hadassah Kashani [1], Azaria JJT Rein [1]

[1] Pediatric Cardiology, [2] Pediatrics, Hadassah Hebrew University Medical Center, Jerusalem, Israel

Background: 2D strain imaging (2DSI) is a novel technique for assessment of myocardial performance. This "speckle" tracking (non-Doppler) technique is assumed to be independent of the angle of insonation.
Aim: To test this assumption in children with a wide span of insonation angles.
Methods: We analyzed 2DSI studies of 30 children aged 61 months (0-219) with normal cardiac function at different angles of insonation using the GE Medical Systems software (Milwaukee, WI, USA). In apical four chamber view (A4CH) insonation angles for the septum ranged from 0° to 20° and for the free wall 15° to 40°. In parasternal long axis view (PSLA), insonation angles for the septum ranged from 5° to 45° and for the free wall 15° to 60°. Regional longitudinal velocity, regional strain and strain rate were measured for the septum and the free wall at increment angle of insonation of 5°.
Results: There was no significant variability of regional longitudinal velocity, strain and strain rate neither over the septum nor the free wall within the described angle span (ANOVA p=ns).
Conclusions: This in vivo study confirms that longitudinal velocity, strain and strain rate measured by 2DSI technique are not affected by the angle of insonation (up to 60°).