Speckle tracking echocardiography and aortic mechanics.

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April 29, 2016
Objectives

1. What is speckle tracking?
2. How does it work on the aorta?
3. What can it tell us?
How does speckle tracking work?
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Figure 8  Displacement of acoustic markers from frame to frame. Green dots represent the initial position and red the final position of the speckles.

Heart 2010;96:716—722. doi:10.1136/hrt.2007.141002
Strain(%) = \frac{L - L_0}{L_0}
Strain is champ
Strain(%) = \frac{L - L_0}{L_0}
Speckle tracking on the aorta
2D Strain

Longitudinal

Circumferential

Radial
3D Strain

Tangential

Longitudinal

Circumferential

Radial
Aortic Valve Disease and Vascular Mechanics: Two-Dimensional Speckle Tracking Echocardiographic Analysis

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Echocardiography 2016;00:1–10
Eur J Vasc Endovasc Surg 18, 515–522 (1999)

Elastic Compliance
Viscoelasticity

Strain %

mmHg
Hurdles and questions

1. Variable image quality
2. Validation for use on the aorta
3. Strain values compared with other modalities
4. Reliance on algorithms (2D vs 3D)
5. Variance between patients
6. Variance within patients (time and location)
(some) clinical questions

1. Ventricular-aortic interactions (near and far)
2. Stiffness in aneurysmal disease
3. Effects of aortic interventions (open vs surgical)