Strain in Cardiovascular Anesthesia

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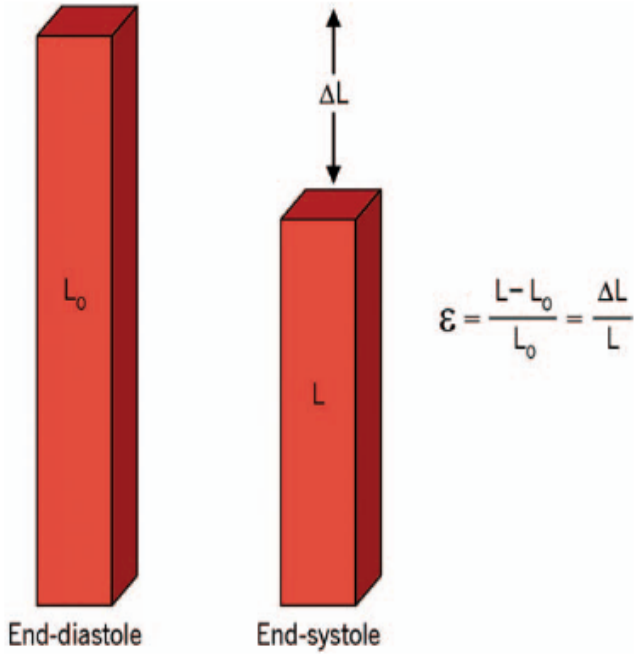
Conflict of interest

- No COI
- Philips user

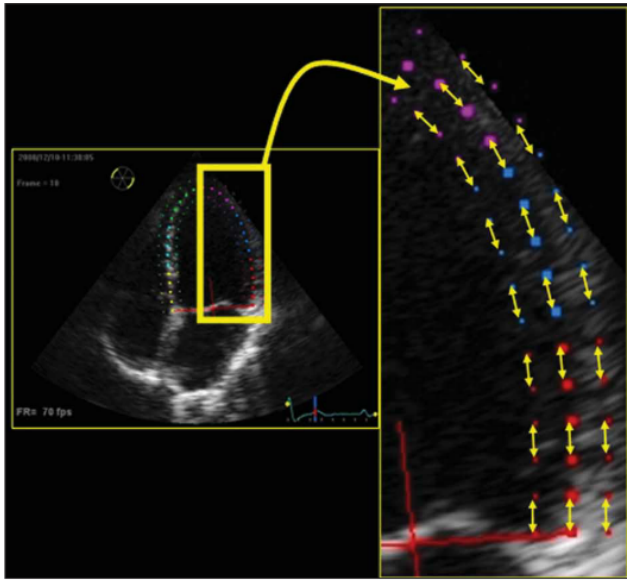
Definition

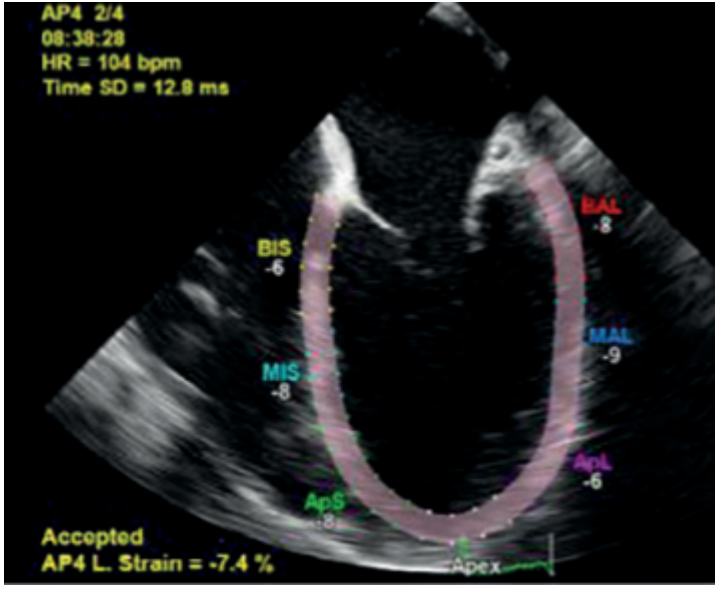


- Lagrangian Strain
- Dimensionless
- + when length ↑
- - when length ↓

Duncan Andra E, et al. Anesth Analg 2014; 118:525–44

Measurement

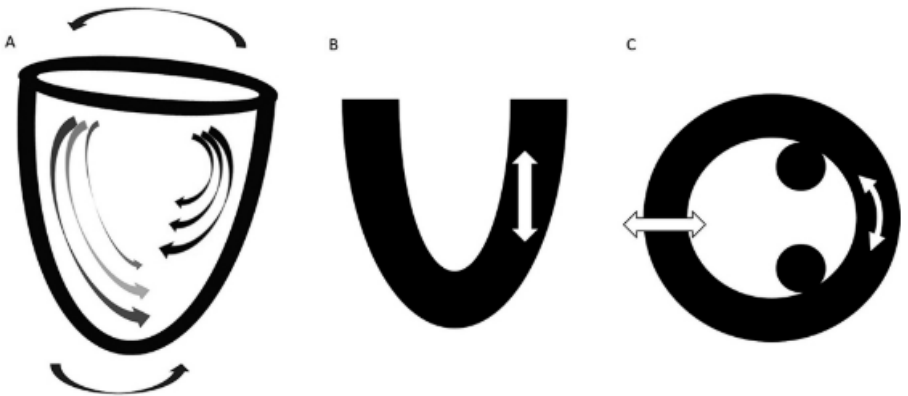




Mondillo Sergio, et al.: Speckle-Tracking Echocardiography 2011:71–83
Ocane Jaquet, et al. Myocardial deformation imaging in anesthesia and perioperative medicine: A non systematic review. Acta Anaesthesiol Belg 2020; 71:15–22

Clinical Applications

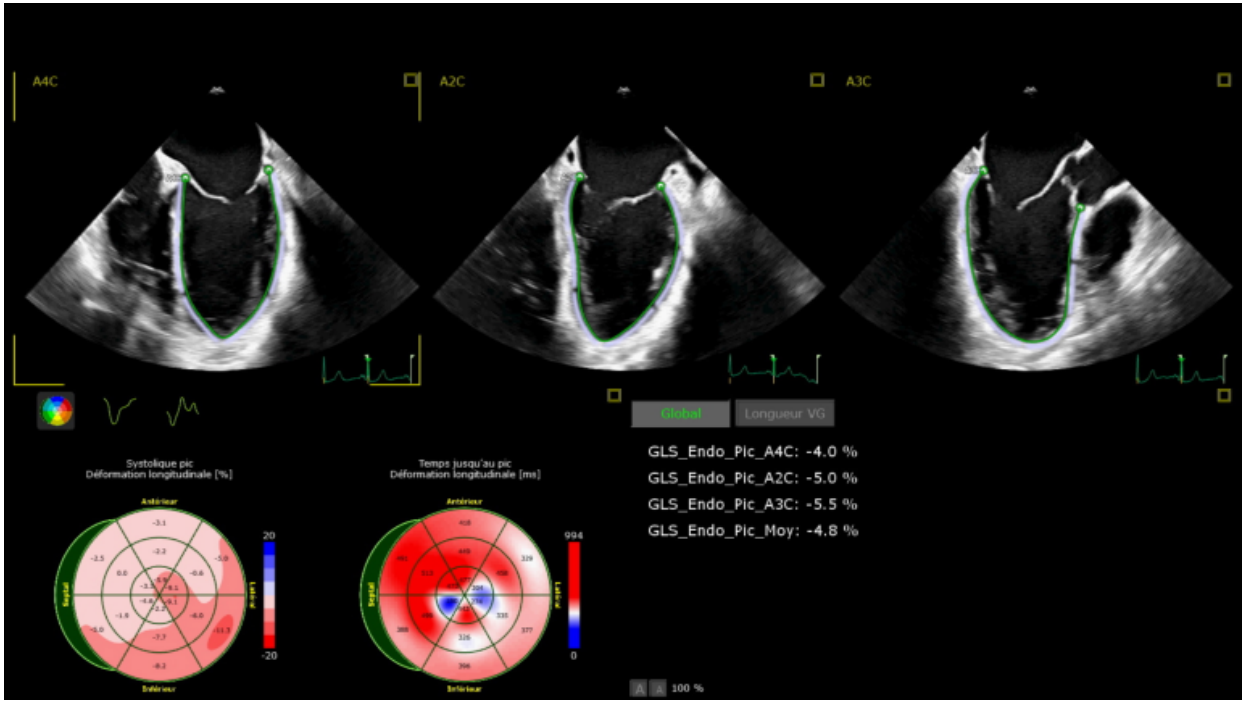
GLS: A measure of LV systolic function



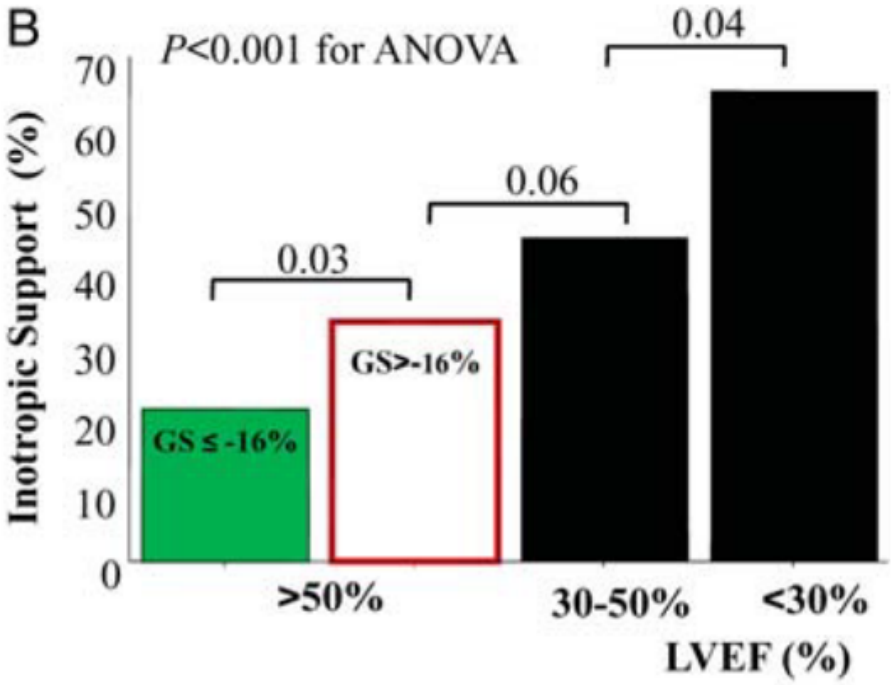
Oceane Jaquet, et al. Acta Anaesthesiol Belg 2020; 71:15–22

Clinical Applications

GLS: A measure of LV systolic function



GLS and Post-operative LCOS



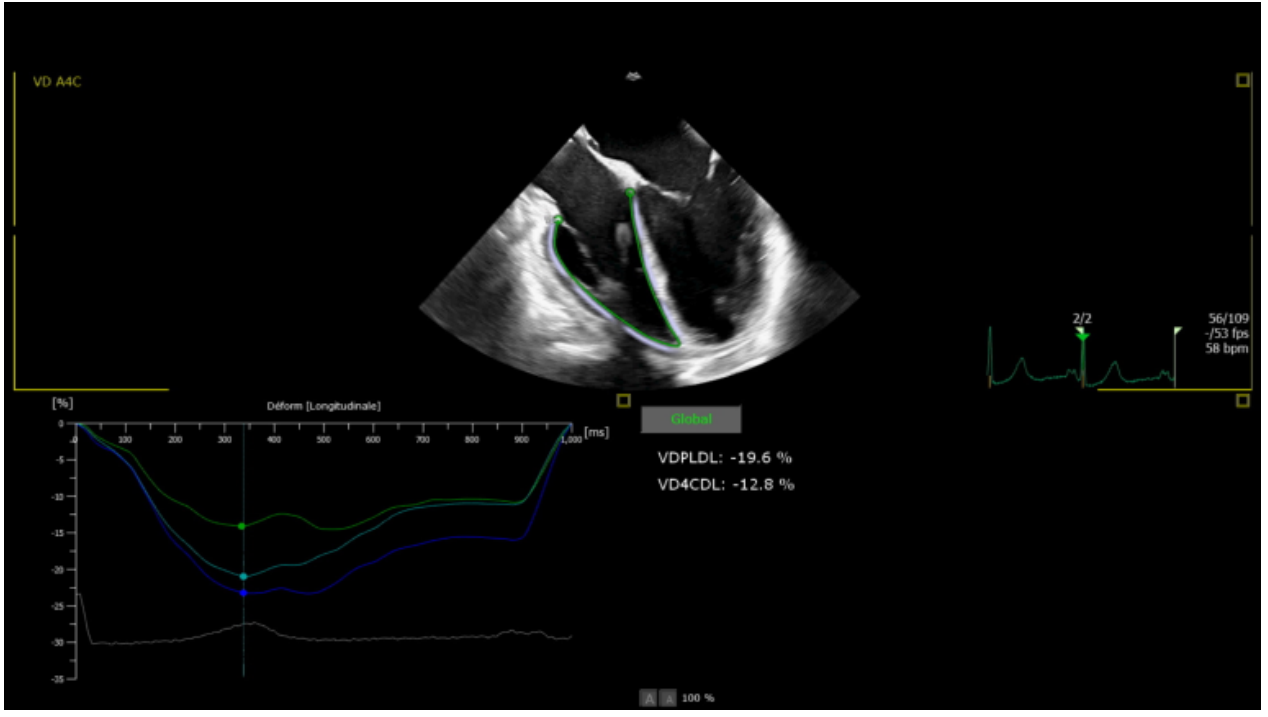
Ternacle J, et al.. Incremental value of global longitudinal strain for predicting early outcome after cardiac surgery. 2013:77–84.

GLS and Post-operative LCOS

Amabili P, et al. Anesth Analg 2018;126:1476–83.

Clinical Applications

RVS or FWS: A marker or RV systolic function



1. Johnson C, et al. Echo Res Pract 2019;6:R87–98.

Intra-operative strain and RV failure aver LVAD implantation

Aymami M, et al. J Card Fail 2018;24.

Beck DR, J et al. Cardiothorac Vasc Anesth 2017;31:2096–102.

Charisopoulou D, et al. Eur Hear journal Cardiovasc Imaging 2019;20:199–208.

Limitations of Strain Measurement

- Load-dependency
- Software dependency
- Endocardial border adjustment

Conclusion

- GLS is helpful in LCOS prediction
- Pre-operative RVS and FWS predict RF failure before LVAD implantation
- Future development
  - Strain and diastolic function
  - Atrial strain