

P1-44

Assessment of left ventricular myocardium development during the fetal life by speckle tracking echocardiography

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Background

Human left ventricular myocardium is an anisotropic tissue in which the constituent cardiomyocytes are arranged in a complex three-dimensional network. However, the timing of the development myocardial layers during the fetal life is still unknown.

The aim of the study is to study the development of left ventricular myocardial layers by speckle tracking at different gestational ages.

Methods

We enrolled 30 normal fetuses aged between 18 and 34 weeks of gestation and 11 normal infants. Longitudinal endocardial and epicardial strain by speckle tracking echocardiography was obtained by apical four chambers view.

Results

During the fetal life, endocardial and epicardial longitudinal strain values progressively increased (Endo: $r = -0.49$; $p = 0.006$; Epi: $r = -0.39$; $p = 0.04$). The endocardial layer developed earlier than the epicardial layer, however the ratio between epicardial and endocardial strain progressively increase during the fetal life (Figure) ($r = 0.73$; $p < 0.0001$).

Conclusion

Left ventricular myocardium maturation is a process that begins relatively late during fetal life and is ongoing also after birth. The subendocardial layer appears earlier than the epicardial layer.

