Full Title: Subclinical Left Ventricular Dysfunction in COVID-19

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Background
Coronavirus Disease-2019 (COVID-19) is associated with cardiovascular injury, but left ventricular (LV) function is largely preserved. We aimed to evaluate for subclinical LV dysfunction in patients with COVID-19 through myocardial strain analysis.

Methods
We performed a single-center retrospective cohort study of all patients hospitalized with COVID-19 who underwent echocardiography. Traditional echocardiographic and global longitudinal strain (GLS) values were compared with prior and subsequent echocardiograms.

Results
Among 96 patients hospitalized with COVID-19 with complete echocardiograms, 67 (70%) had adequate image quality for strain analysis. The cohort was predominantly male (63%) and 18% had prevalent cardiovascular disease (CVD). Echocardiograms were largely normal with median [IQR] LV ejection fraction (EF) 62% [56%, 68%]. However, median GLS was abnormal in 91% (-13.5% [-15.0%, -10.8%]). When stratified by CVD, both groups had abnormal GLS, but presence of CVD was associated with worse median GLS (-11.6% [-13.4%, -7.2%] vs -13.9% [-15.0%, -11.3%], p=0.03). There was no difference in EF or GLS when stratified by symptoms or need for intensive care. Compared to pre-COVID-19 echocardiograms, EF was unchanged, but median GLS was significantly worse (-15% [-16%, -14%] vs -12% [-14%, -10%), p=0.003). Serial echocardiograms showed no significant changes in GLS or EF overall, however patients who died had stable or worsening GLS, while those who survived to discharge home showed improved GLS.

Conclusions
Patients with COVID-19 had evidence of subclinical cardiac dysfunction manifested by reduced GLS despite preserved EF. These findings were observed regardless of history of CVD, presence of COVID-19 symptoms, or severity of illness.