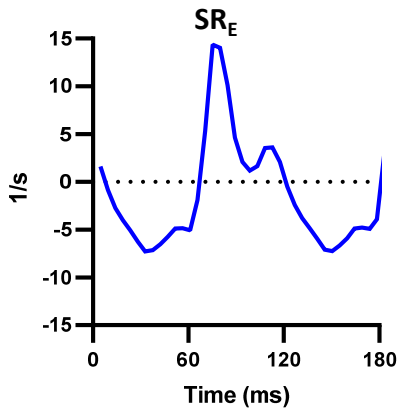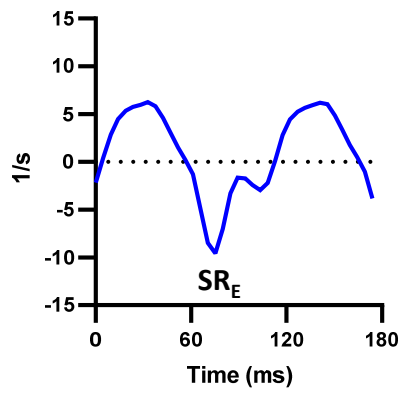|	Control	T2D
Global radial strain (%)	34.4 ± 1.7	34.1 ± 3.4
Global circumferential strain (%)	-26.9 ± 0.9	-24.6 ± 2.6
Global longitudinal strain (%)	-25.6 ± 1.2	-21.6 ± 1.2*
Longitudinal:		
Diastolic peak strain rate (1/s)	12.2 ± 0.7	8.20 ± 0.6*
Systolic peak strain rate (1/s)	-8.05 ± 0.5	-7.39 ± 0.5
Diastolic peak velocity (cm/s)	-1.09 ± 0.1	-0.74 ± 0.1*
Systolic peak velocity (cm/s)	0.84 ± 0.04	0.70 ± 0.04*
Radial:		
Diastolic peak strain rate (1/s)	-12.5 ± 0.9	-8.41 ± 0.50*
Systolic peak strain rate (1/s)	7.33 ± 0.4	7.39 ± 0.6
Diastolic peak velocity (cm/s)	-1.87 ± 0.1	-1.39 ± 0.2*
Systolic peak velocity (cm/s)	1.32 ± 0.04	1.29 ± 0.1
Circumferential:		
Diastolic peak strain rate (1/s)	12.6 ± 0.9	8.39 ± 0.8*
Systolic peak strain rate (1/s)	-8.88 ± 0.4	-9.09 ± 1.0
Diastolic peak velocity (cm/s)	-221 ± 29	-183 ± 18
Systolic peak velocity (cm/s)	206 ± 18	171 ± 20

Supplementary Table 1. Benchmark values of echocardiographic myocardial wall deformation imaging in T2D mice. Data are presented as mean ± SEM. n = 7-8/group. Analyzed by Students unpaired t-test, *p< 0.05.
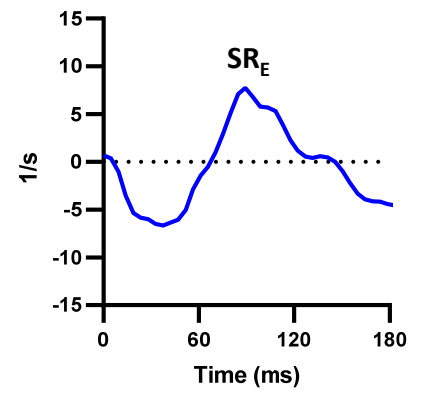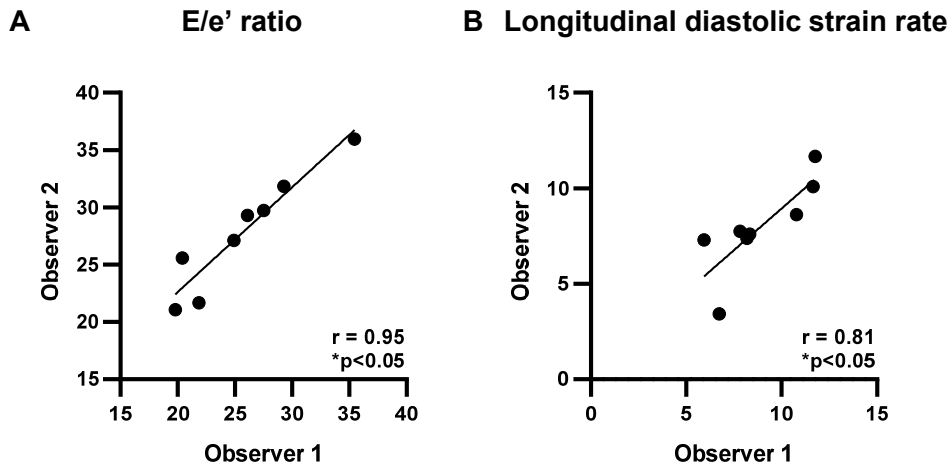
Supplementary Figure 1. Representative strain rate profiles for longitudinal, radial and circumferential planes. Early strain rate peak (E_{SR}) is indicated.

A E/e' ratio

Observer 2 (y-axis): 15, 20, 25, 30, 35, 40
Observer 1 (x-axis): 15, 20, 25, 30, 35, 40

r = 0.95
*p<0.05

B Longitudinal diastolic strain rate

Observer 2 (y-axis): 0, 5, 10, 15
Observer 1 (x-axis): 0, 5, 10, 15

r = 0.81
*p<0.05

Supplementary Figure 2. Reproducibility analysis for E/e' ratio and longitudinal diastolic strain rate in mice, comparing two independent observers. r, Pearson correlation coefficient.
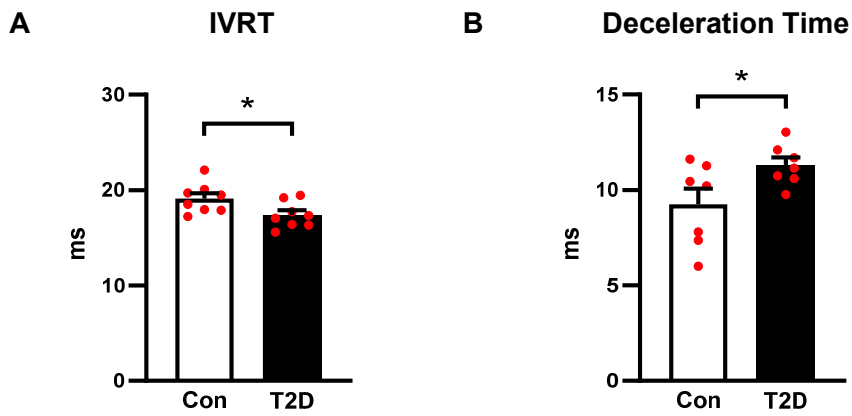
Supplementary Figure 3. (**A**) Isovolumetric relaxation time (IVRT) in T2D mice (20 weeks high fat high sugar diet). Analyzed by Students unpaired t-test. (**B**) Mitral valve E-wave deceleration time in T2D mice (20 weeks high fat high sugar diet). Analyzed by Students unpaired t-test. Data are presented as mean ± SEM. n = 7-8/group. *$p < 0.05$.