

**Segmental Diastolic Dysfunction of Left Ventricular Wall
in Patients with 50% Coronary Artery Stenosis**

**R. Kakihara, M.D., C. Naruse,
H. Hironaka, T. Tsuzuku,
Kakihara Clinic, Toyohashi,
Japan**

Purpose

Coronary artery stenosis is known to cause segmental diastolic dysfunction of the left ventricular wall.

However, the degree of stenosis necessary to cause diastolic dysfunction is unknown.

We utilized strain rate profile of resting echocardiography to investigate the segmental diastolic dysfunction of patients with various degrees of coronary artery stenosis.

Total patients : 126 patients who had undergone CAG.

Normal coronary artery group (129 seg.) (gr-N) : 43 pt.

25% CAS (24 seg.) (gr-S1) : 22 pt.

50% CAS (32 seg.) (gr-S2) : 20 pt.

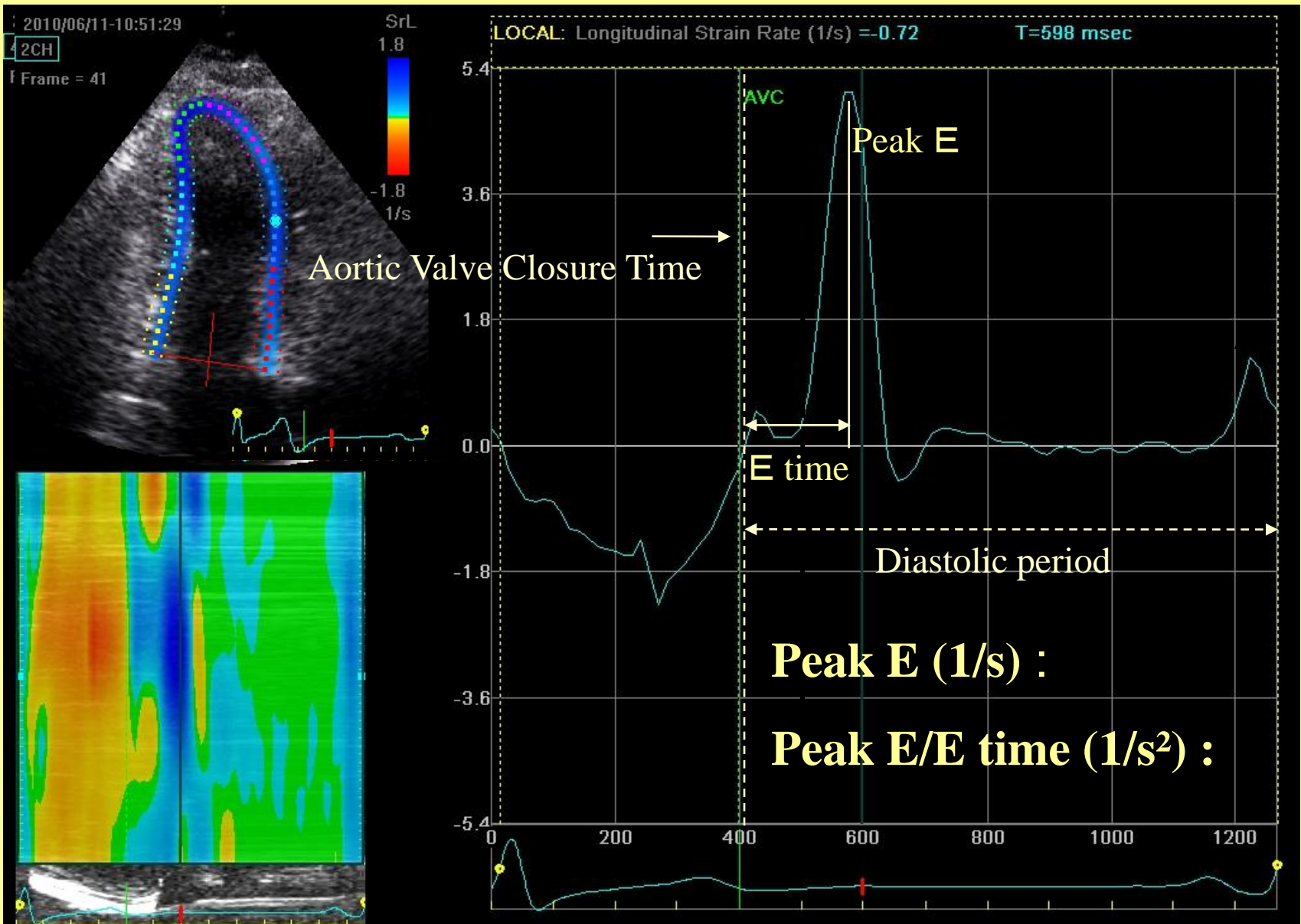
75% CAS (26 seg.) (gr-S3) : 20 pt.

90% \leq CAS (21 seg.) (gr-S4) : 21 pt.

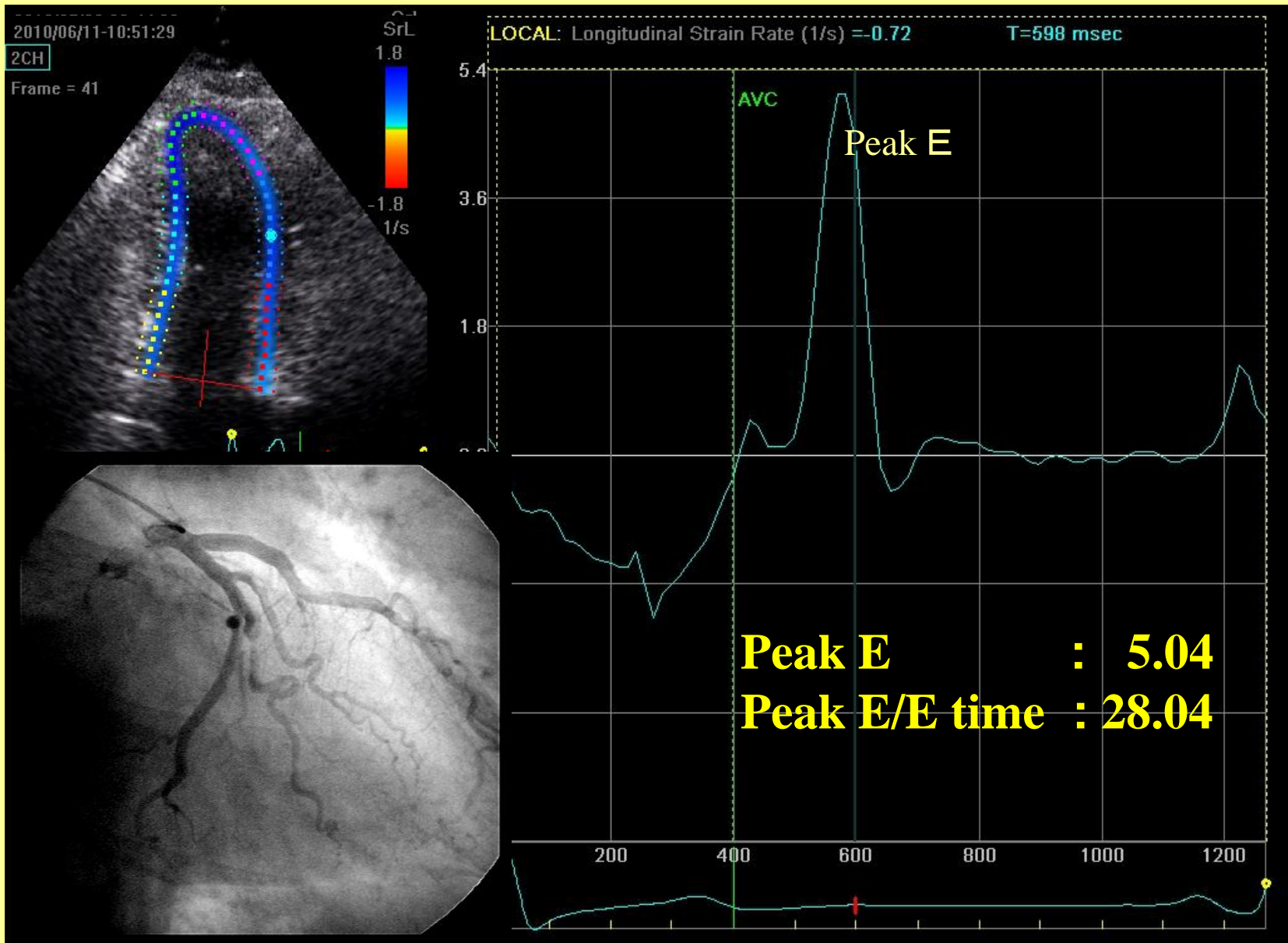
Variables Employed to Evaluate Segmental Myocardial Diastolic Function

**Peak E (1/s peak speed of active self-extension of myocardium
of the segment)**

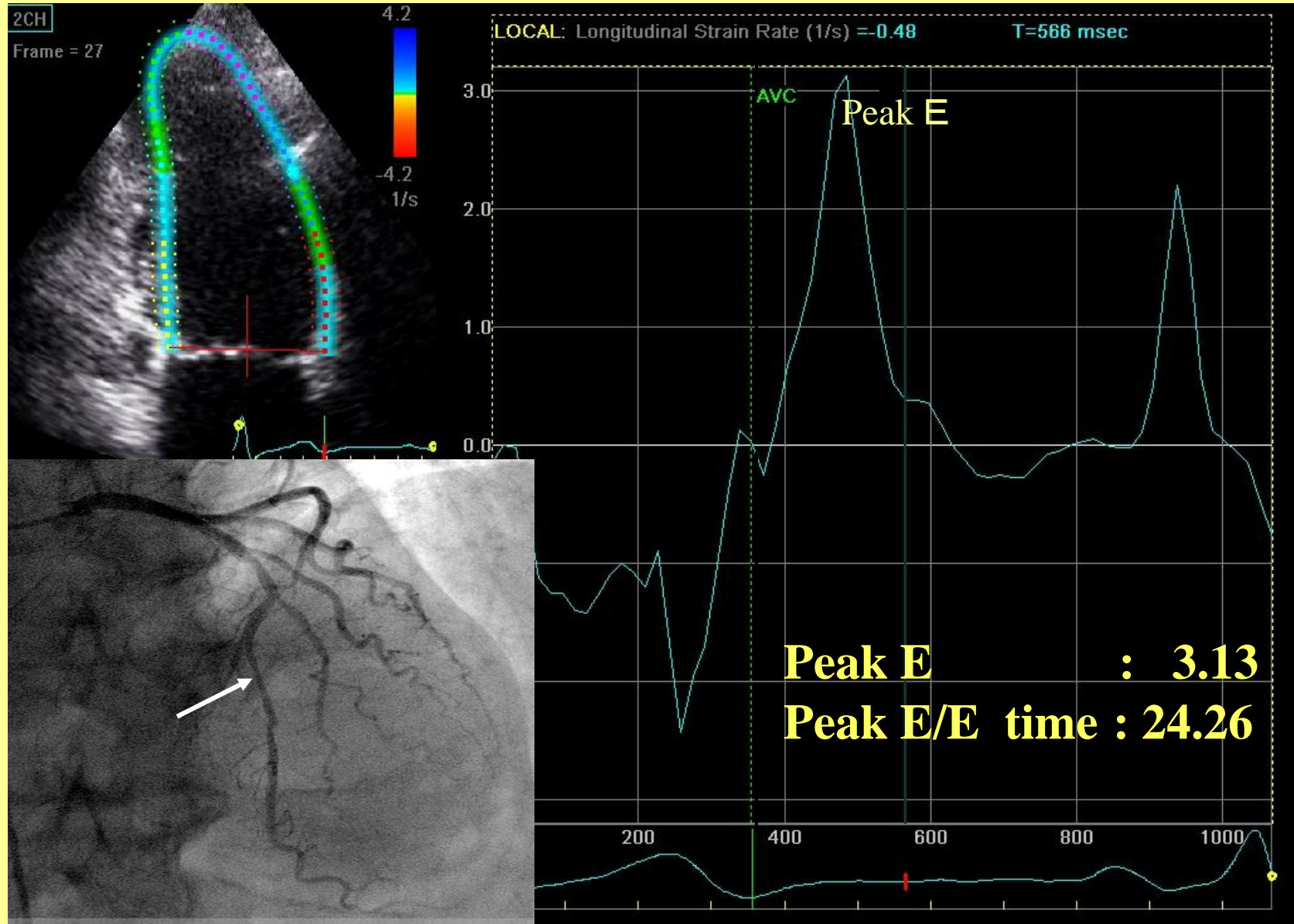
**E/E time (1/s² averaged acceleration rate of of active
self-extension of myocardium of the segment)**

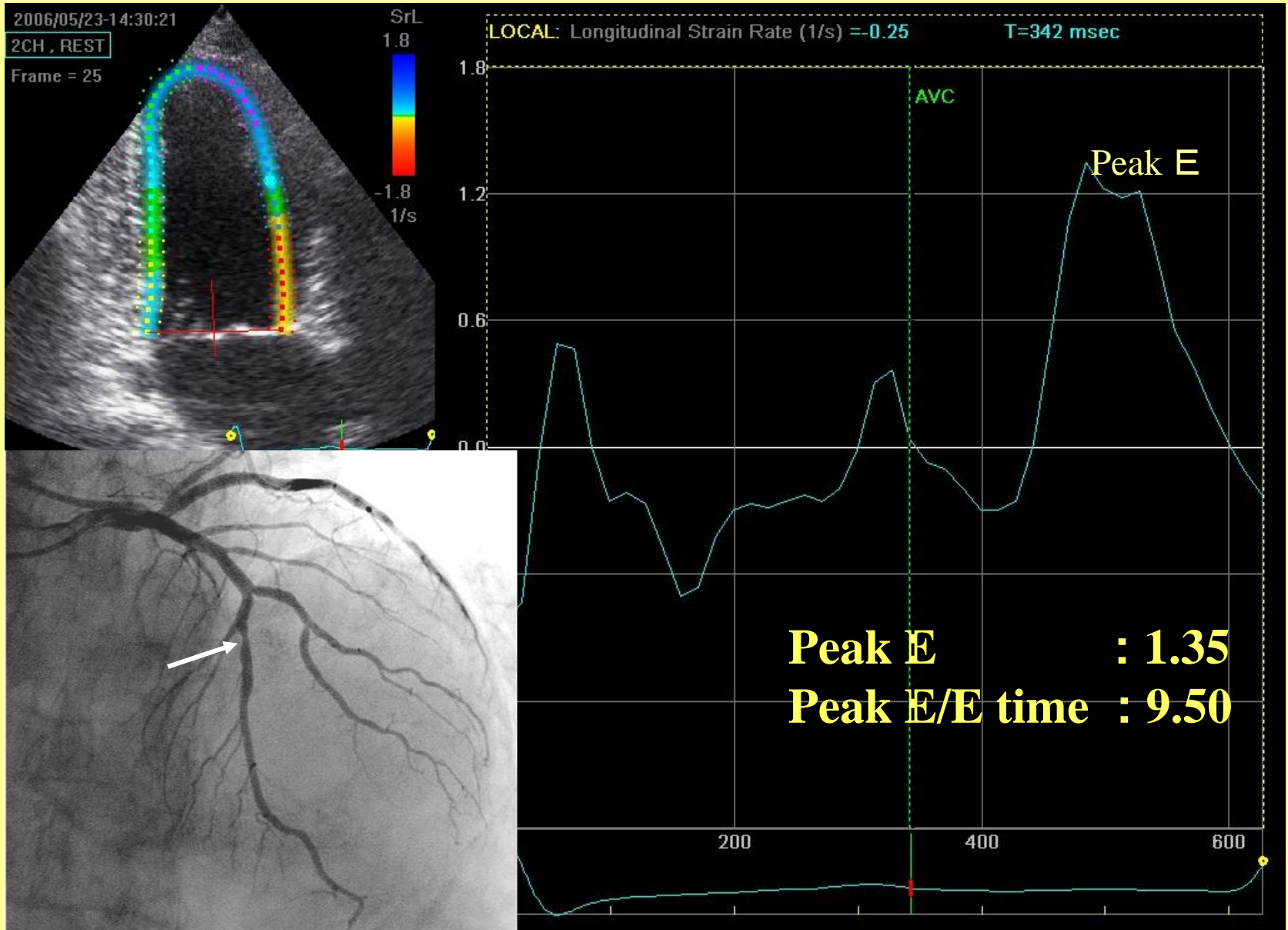


Strain Rate Profile

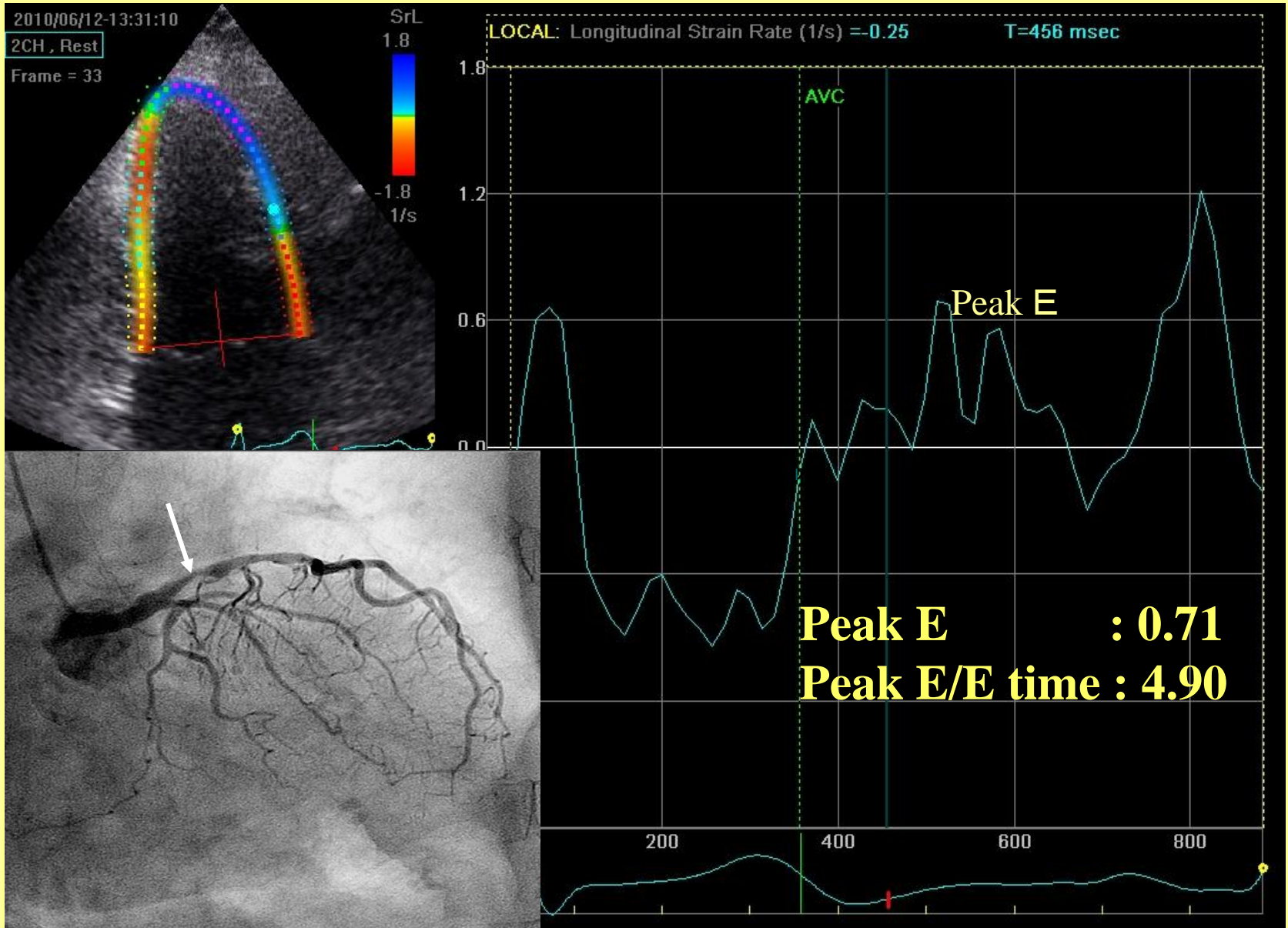


Normal LAD

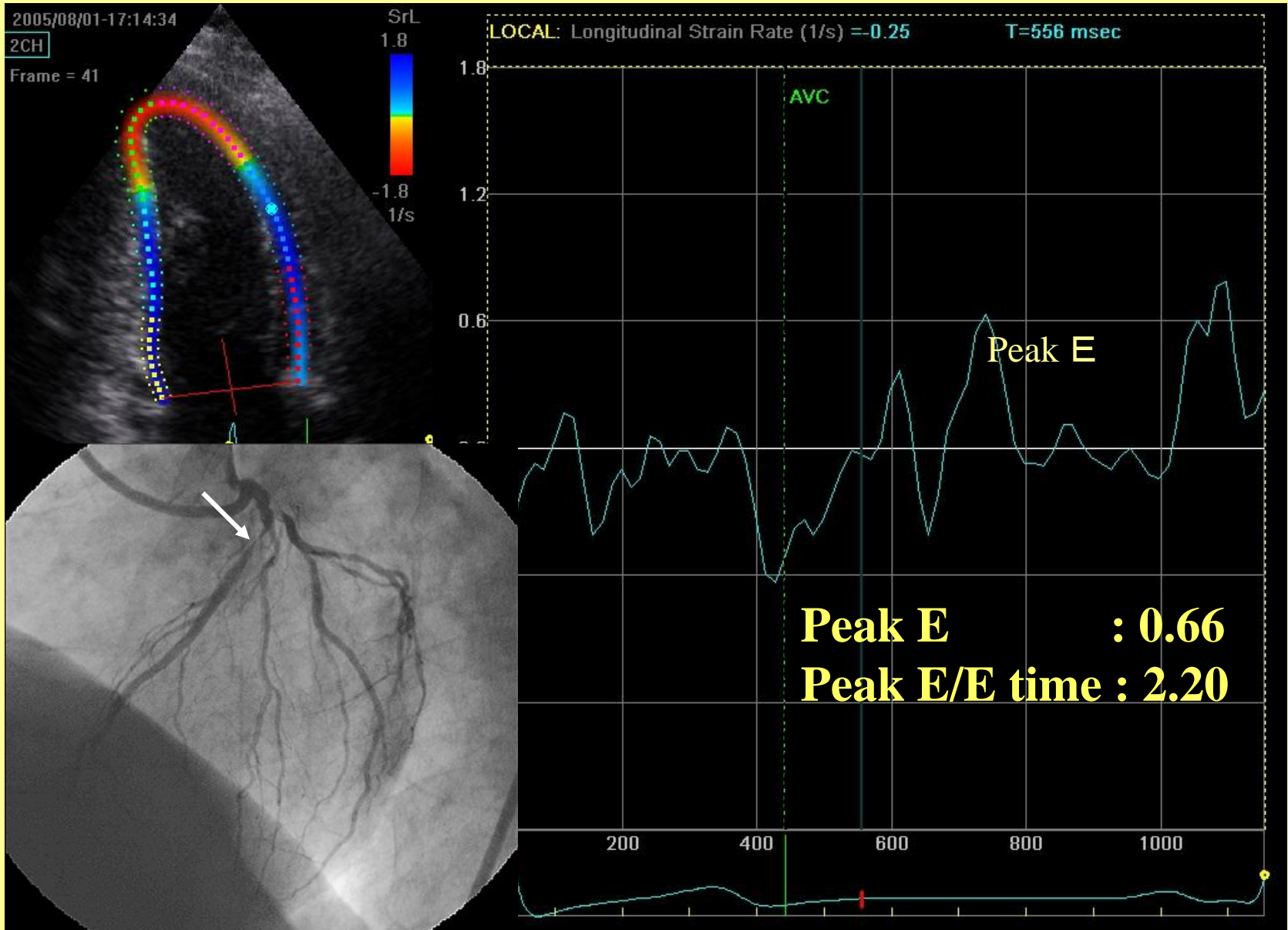




LAD #7 50% stenosis



LAD #7 75% stenosis



LAD #7 90% stenosis

Results of Peak E & Peak E/E time

	gr - N	gr - S1	gr - S2	gr - S3	gr - S4
stenosis	normal	25 %	50 %	75 %	90 % ≤

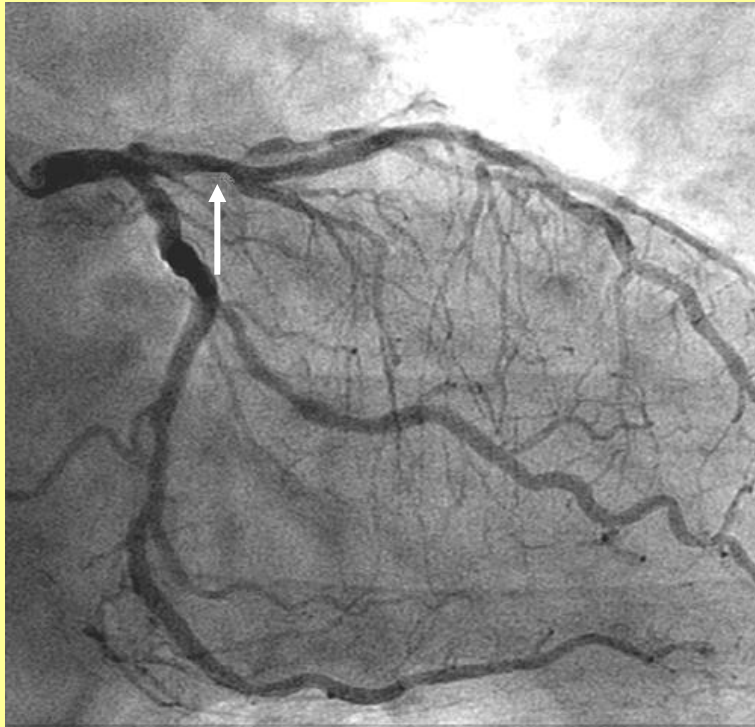
Peak E (1/s)

values	1.85±0.34	1.75±0.48	1.34±0.50	1.13±1.85	1.03±0.21
p <		N.S.	p < 0.05	p < 0.001	p < 0.001

Peak E/E time (1 / s²)

values	17.23±10.27	15,22±8.23	10.11±4.57	7.28±2.26	6.67±2.86
p <		N.S.	p < 0.01	p < 0.001	p < 0.001

unpaired t test

CAG (LCA)**LAD #6 50% stenosis****Myocardial Contrast Echocardiography
(MCE) with Levovist : Apex 2ch**

The subendocardial layer of the anterior wall (right side) of the LV was imaging defect.
This suggests that ischemia could exist in LAD area.

Conclusion

In 50% coronary artery stenotic area, segmental diastolic dysfunction was detected.

Although 50% coronary artery stenosis is not thought to cause myocardial ischemia, the MCE shown above suggested existing ischemia. This diastolic phenomenon may be an early sign of myocardial ischemia.

Patients with 50% coronary artery stenosis should undergo further hemodynamic testing to evaluate for diastolic dysfunction.