

# TDI VELOCITIES OF TRICUSPID ANNULUS ARE LOWER IN PATIENTS WITH PTE COMPARED WITH HEALTHY CONTROLS

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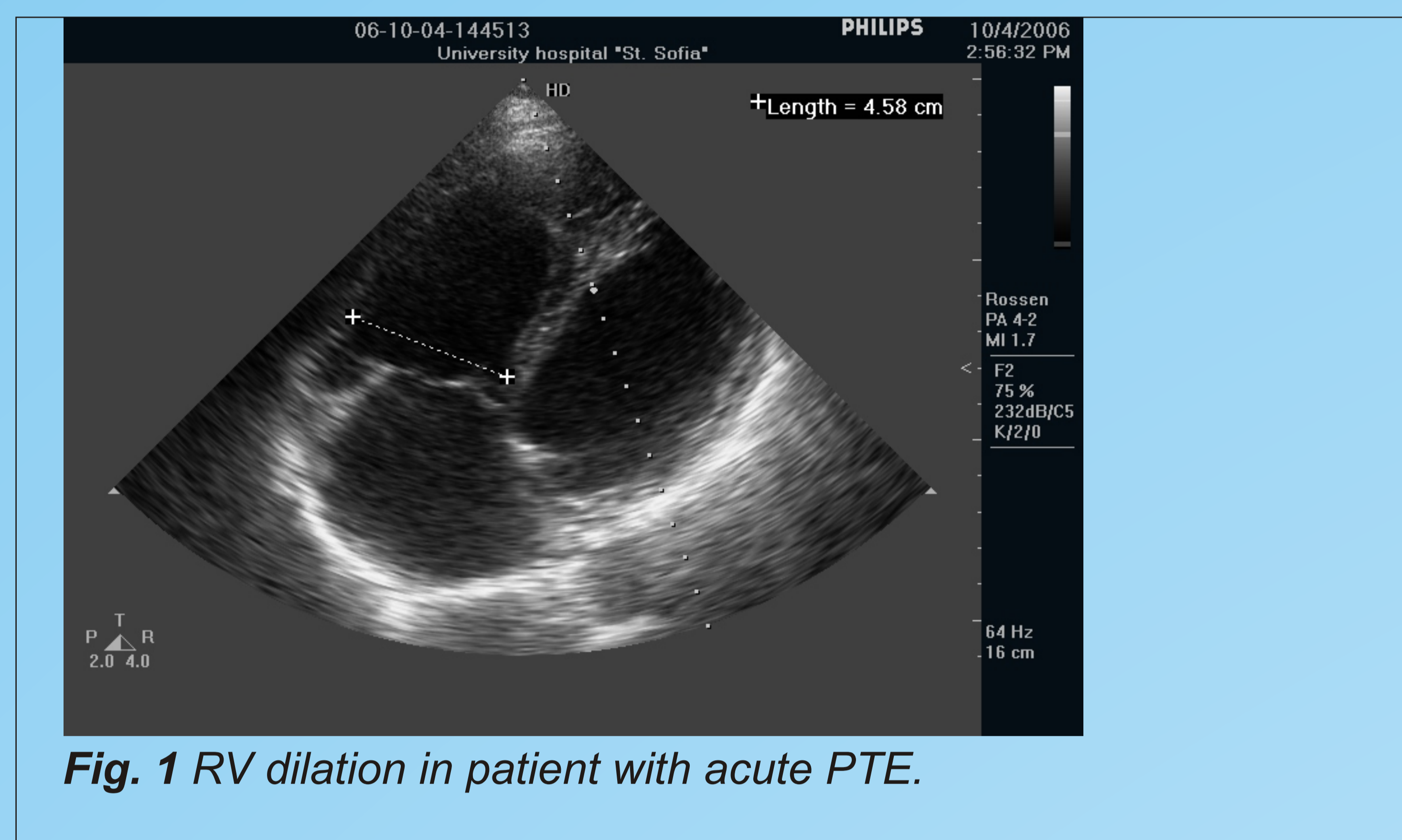


Fig. 1 RV dilation in patient with acute PTE.

**Background.** Simple, rapid and reliable noninvasive assessment of the pulmonary pressures and RV function has important diagnostic and therapeutic implications in patients with pulmonary thromboembolism (PTE). Tissue Doppler imaging (TDI) of the tricuspid annulus (TA) is a relatively new method of assessment of the RV function, which is still underused.

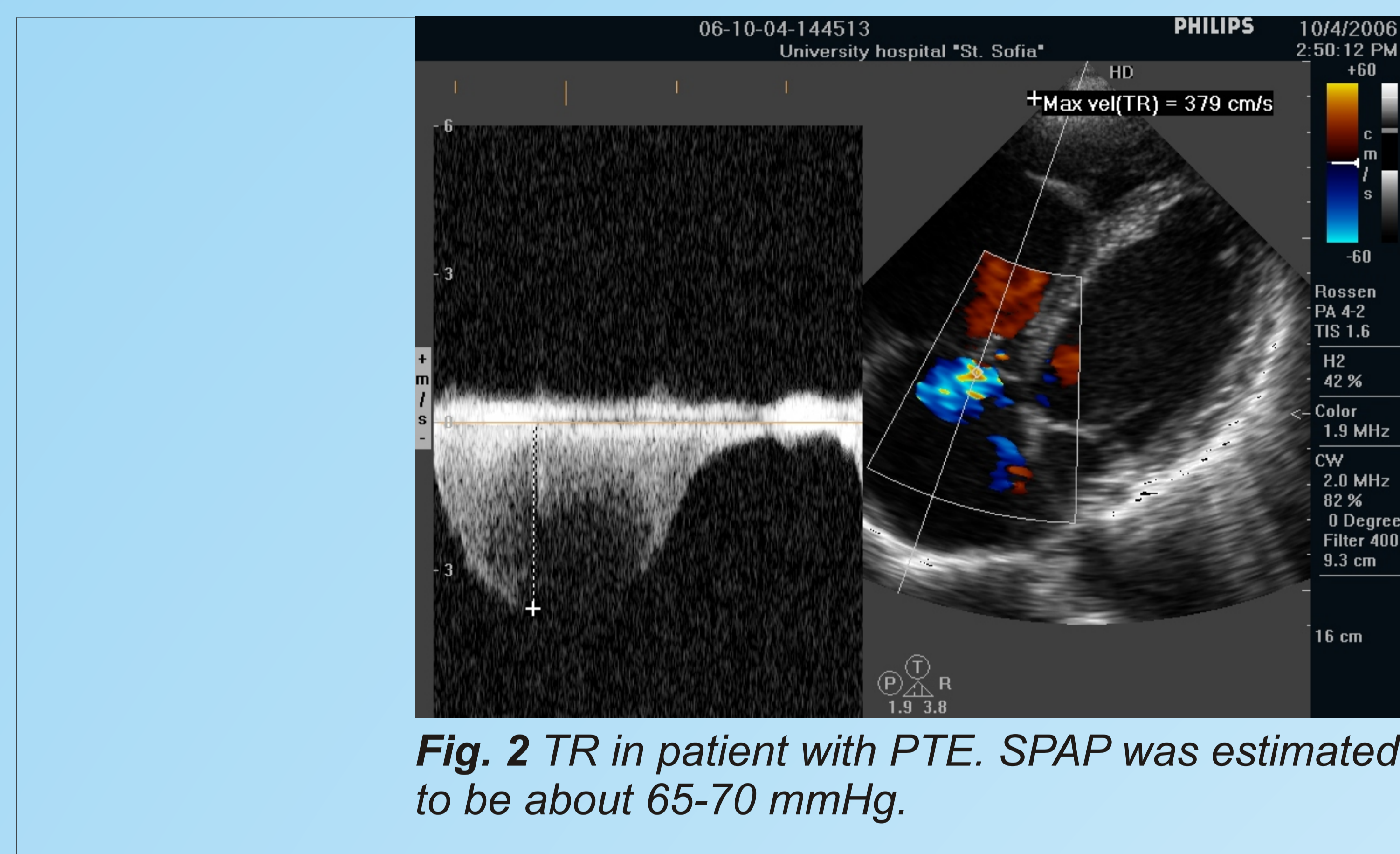


Fig. 2 TR in patient with PTE. SPAP was estimated to be about 65-70 mmHg.

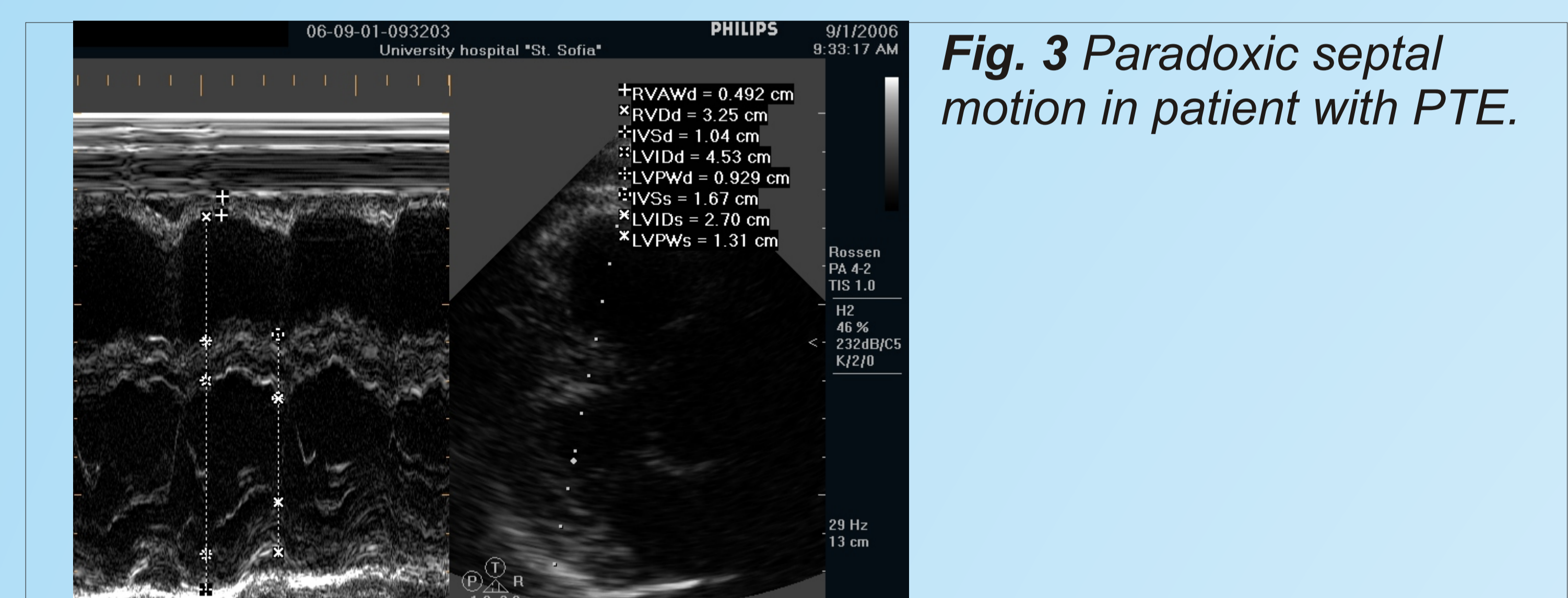


Fig. 3 Paradoxical septal motion in patient with PTE.

**Aim.** The aim of this study was to determine whether the velocities derived from TDI of TA could be used as helpful markers of RV function comparing healthy controls and patients with PTE

**Methods and results.** Conventional echocardiography and pulsed TDI were performed in 137 patients (64 women and 73 men) with acute PTE and normal left ventricular ejection fraction ( $63 \pm 5\%$ ) and in 28 matched healthy volunteers (CG). The tricuspid annular systolic ( $S_{tr\_v}$ ) and diastolic velocities ( $E_{tr\_v}$ ) were acquired in apical four-chamber view at the junction of the right ventricular free wall and the anterior

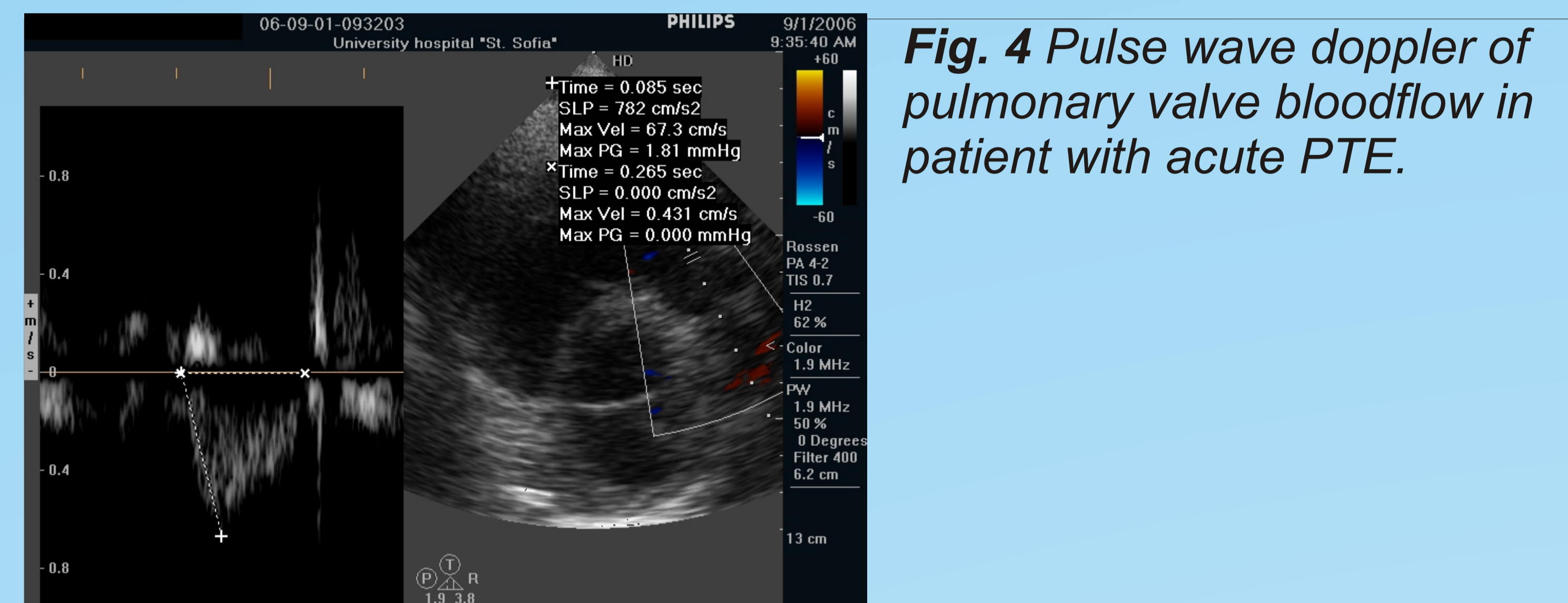


Fig. 4 Pulse wave doppler of pulmonary valve bloodflow in patient with acute PTE.

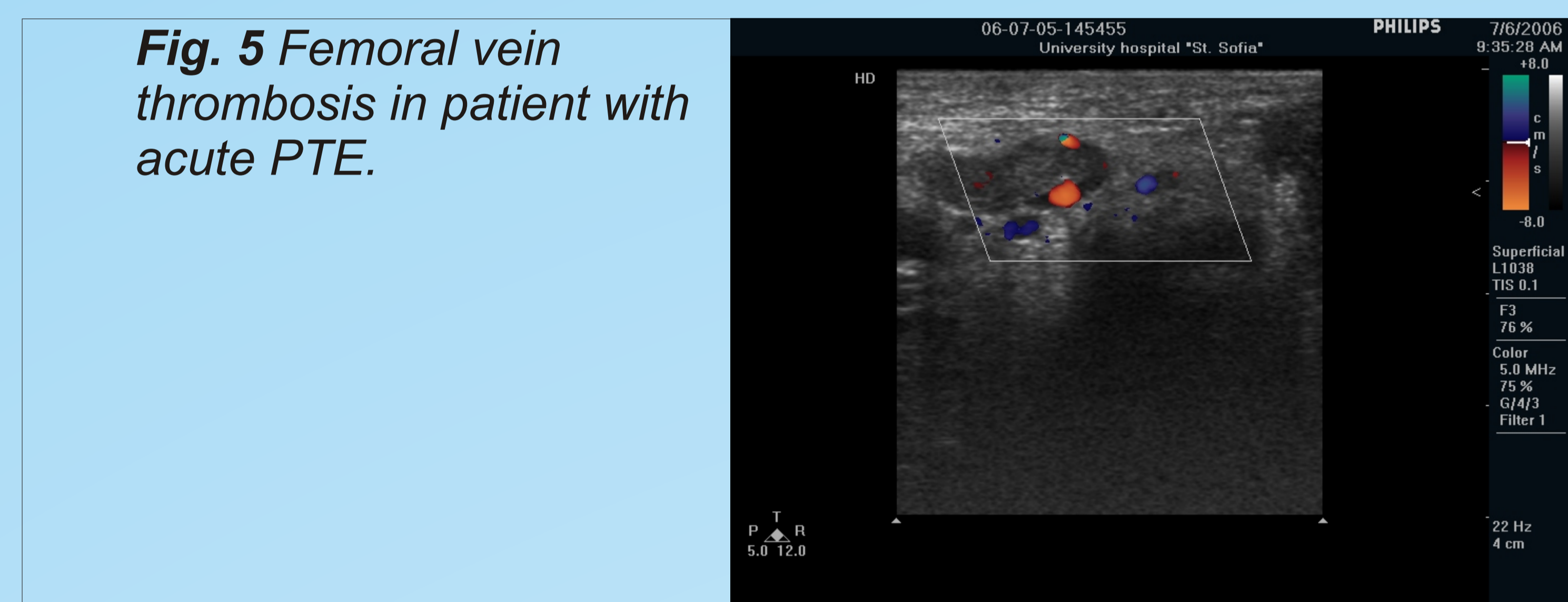


Fig. 5 Femoral vein thrombosis in patient with acute PTE.

leaflet of the tricuspid valve using TDI. Continuous/pulse wave Doppler data from the pulmonary flow and tricuspid regurgitation showed that pulmonary hypertension ( $PAPs > 30 \text{ mmHg}$ )  $x = 43.5 \pm SD 7.1 \text{ mmHg}$  and  $PAPm$  calculated using Debestani formula ( $PAPm > 20 \text{ mmHg}$ )  $x = 32.5 \pm SD 7.5 \text{ mmHg}$  and RV dilatation ( $RVEDD > 27 \text{ mm}$ )  $x = 33.1 \pm SD 3.4 \text{ mm}$  were present in 75% of patients with PTE. In patients with PTE systolic and diastolic TA velocities were significantly lower than in healthy controls  $S_{tr\_v} - x_{PTE} = 11.8 \pm SD 1.7 \text{ cm/s}$ ;  $x_{CG} = 16.8 \pm SD 1.9 \text{ cm/s}$  ( $p < 0.001$ ) and  $E_{tr\_v} - x_{PTE} = 11.3 \pm SD 1.8 \text{ cm/s}$ ;  $x_{CG} = 16.8 \pm SD 1.6 \text{ cm/s}$  ( $p < 0.001$ ). There was a good reverse correlation between systolic annular velocity and  $PAPs$  and  $PAPm$  ( $r = 0.72$ ;  $r = 0.74$ ,  $P < 0.001$ ). In patients with PTE and RA and inferior vena cava dilation  $S_{tr\_v}$  was significantly lower -  $11.0 \pm SD 1.4 \text{ cm/s}$  than in patients with PTE and normal dimensions of RA and IVC -  $11.8 \pm SD 1.8 \text{ cm/s}$  ( $p < 0.05$ ). 67% of the PTE patients were with systolic dysfunction of RV if a threshold of  $S_{tr\_v} 12 \text{ cm/s}$  is used.

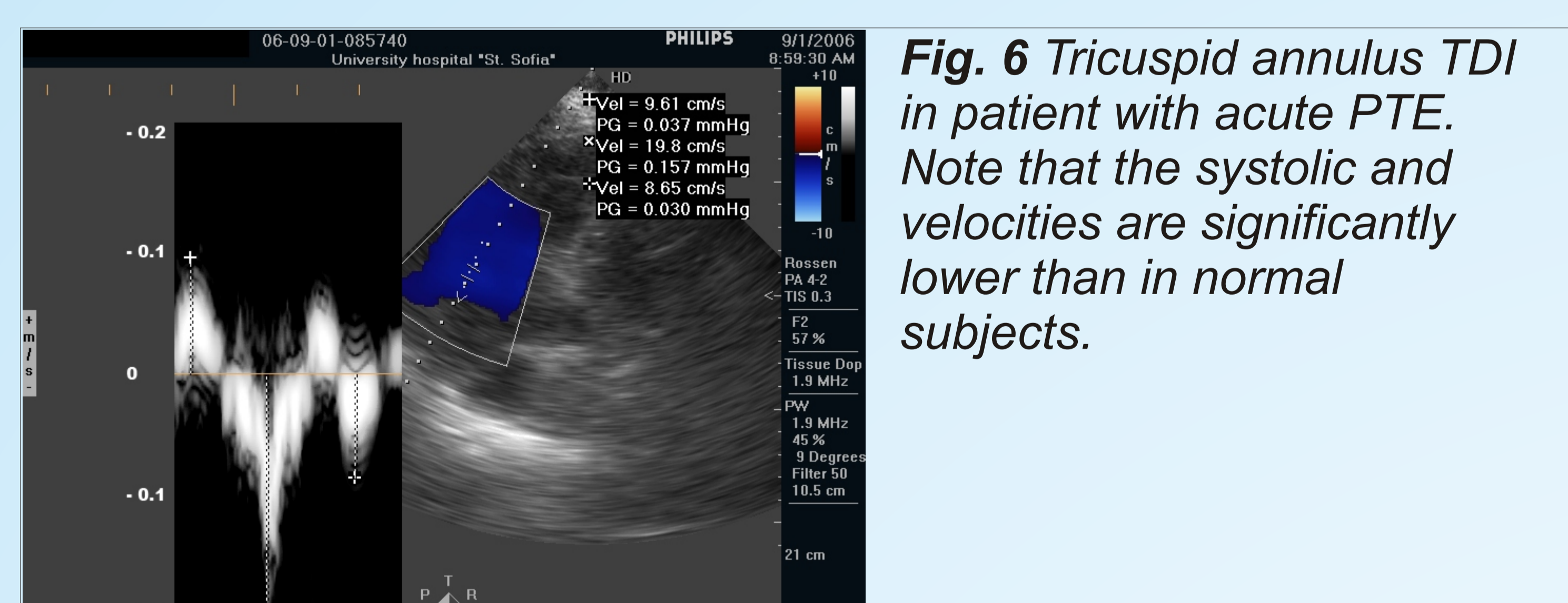


Fig. 6 Tricuspid annulus TDI in patient with acute PTE. Note that the systolic and velocities are significantly lower than in normal subjects.

**Conclusions.** In the clinical setting of PTE TDI velocities of TA are significantly lower than in healthy controls with a reciprocal correlation with  $PAPs$  and  $PAPm$ . These results lead to important practical implication - in patients with PTE the development of RV dysfunction assessed by TDI is very frequent. TDI velocities of TA could be used as helpful indicator of RV function in patients with PTE.

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