Conclusion.— These preliminary results in patients with early severe ARDS under protective mechanical ventilation found low incidences of ACP and PFO. Good TTE sensitivity and specificity for ACP could allow easier follow-up when TTE is possible. ACP was associated with significantly decrease of right ventricular fractional area change and TAPSE.

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Measurement of left ventricular volumes using real-time three-dimensional transesophageal echocardiography in ICU patients. Preliminary results
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Introduction.— Real-time transesophageal echocardiography (RT3D TEE) is a recent imaging modality which has been validated against magnetic resonance imaging for the measurement of left ventricular (LV) volumes. If feasibility in ventilated patients in the ICU is not yet known. The main objective of the study was to test the hypothesis that bidimensional (2D) TEE underestimates LV volumes when compared to RT3D TEE. The secondary objective was to evaluate the feasibility of RT3D TEE in ventilated patients in the ICU and to assess the influence of the analysis software on values of LV volumes.

Methods.— During a two-month period, patients without cardiac history admitted in the ICU for neurological disorder requiring a mechanical ventilation were studied. A 2D TEE performed by an experienced intensivist ruled out any cardiac abnormality and three loops of RT3D TEE were recorded during an end-expiratory apnea to avoid excessive cardiac translation. Measurements were performed off-line using an Xcelera® workstation (Philips) on three non-consecutive cardiac cycles and averaged. LV end-diastolic volume (EDV) and end-systolic volume (ESV) were measured: with 2D TEE using biplane Simpson’s rule, with RT3D TEE using the QLAB® software with two different applications (3DQ and 3DQ advanced). LV ejection fraction (EF) and stroke volume (SV) were calculated from LV volumes obtained with 2D TEE and RT3D TEE. LVSV was also measured using the Doppler method applied at the level of the aortic ring. Values (median with 95th percentiles) provided by the different approaches (volumes and Doppler) were compared using non parametric tests.

Results.— In this pilot study, 10 patients were prospectively studied (age: 44 years [38—52]; SAPSII: 30 [24—37]; BMI: 24 kg/m² [21—29]). 2D TEE underestimated LV volumes when compared to RT3D TEE (EDV: 94 mL [79—157] vs 135 ml [112—149]: P = 0.09 and ESV: 49 ml [38—52] vs 63 mL [52—69]). 2D TEE tended also to underestimate LVSV when compared to RT3D TEE (49 mL [43—78] vs 70 ml [58—82]: P = 0.35). LVEF was similar when calculated with 2D TEE and RT3D TEE volumes (57% [51—63] vs 54% [50—57]). LVSV measured using RT3D TEE was similar to that measured by the Doppler method applied at the level of the aortic ring (70 mL [63—95]). Measurements performed using the 3DQ-advanced software provided results which values were intermediate between 2D TEE and 3DQ TEE (EDV: 123 mL [95—133]; ESV: 50 mL [42—58]).

Conclusion.— RT3D TEE appears as a promising technique which provides a more accurate measurement of LV volumes when compared to conventional 2D TEE. This new technique is feasible in ventilated patients in the ICU but requires the respect of a learning curve for the acquisition and analysis of results.

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