

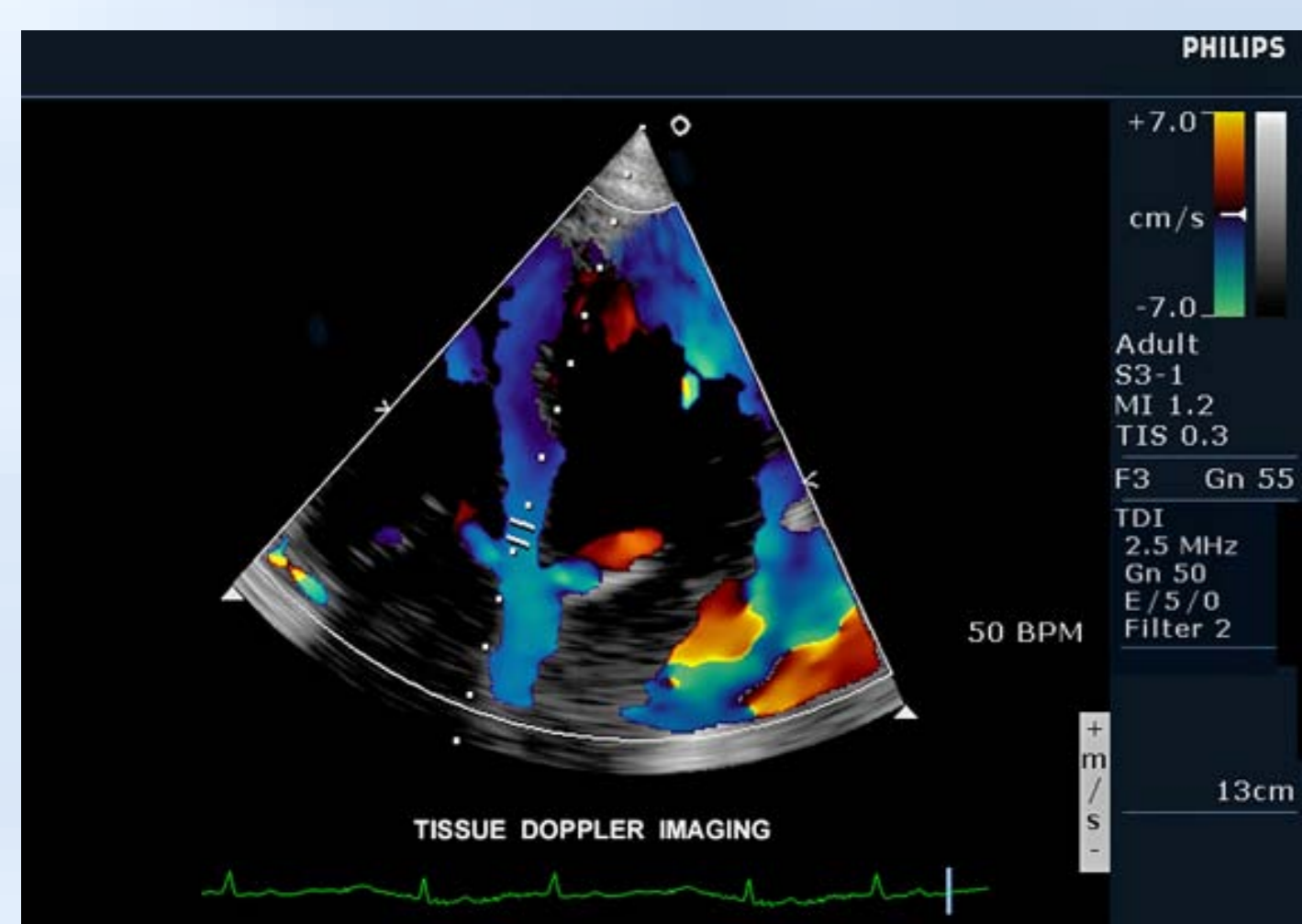
Effects of one-lung ventilation on right ventricular function during thoracic surgery

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Introduction

There are no prospective randomized studies regarding the effects of one-lung ventilation (OLV) on right heart function. We have assessed the heart function in general with transoesophageal echocardiography (TOE), and particularly with Tissue Doppler Imaging (TDI) at the tricuspid valve, the right heart function during two-lung ventilation and OLV.

Methods



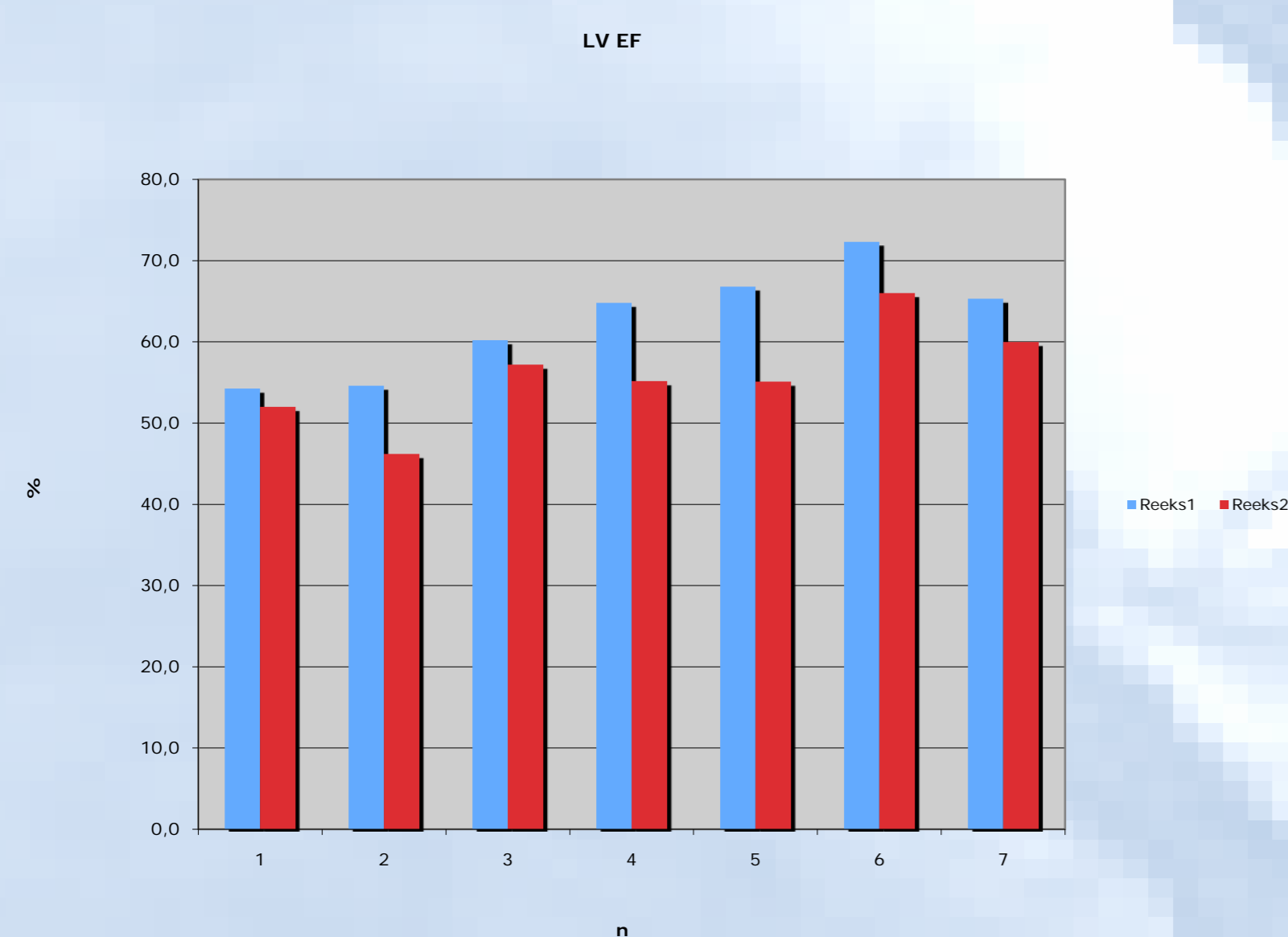
Ten ASA II-III patients were scheduled for elective right thoracotomy. Induction and maintenance of general anaesthesia was standardised. Monitoring consisted of five lead ECG, pulse-oxymeter, NIBP, Radial artery catheter and Pulmonary artery catheter. Ventilatory parameters with 50% oxygen in air remained constant and lung separation was achieved with a left-sided double lumen tube.

The study was performed before surgery. After 15 minutes of TLV hemodynamic parameters were recorded, TOE measurements were done and blood gas samples were drawn. The right lung was excluded from ventilation. After 15 minutes of OLV, the measurements were repeated.

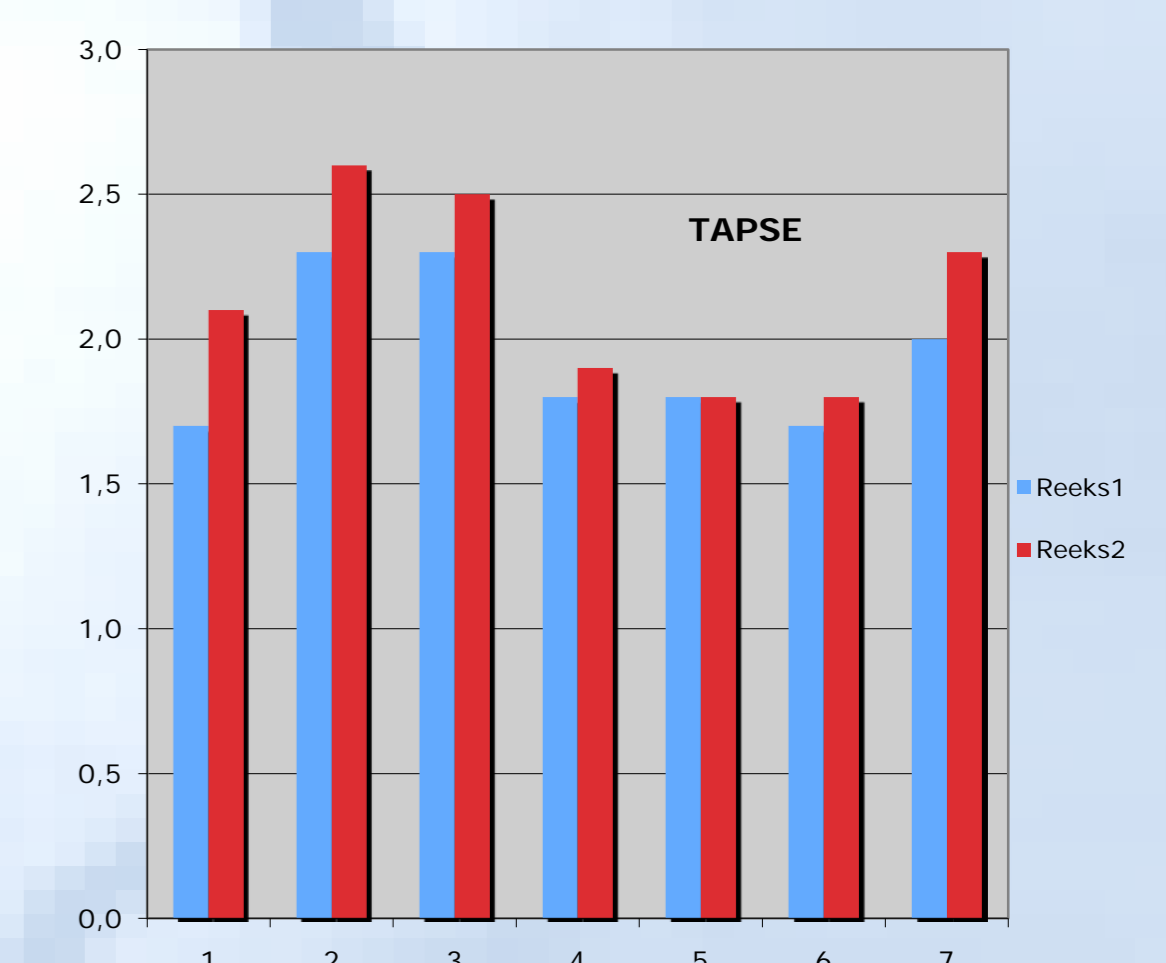
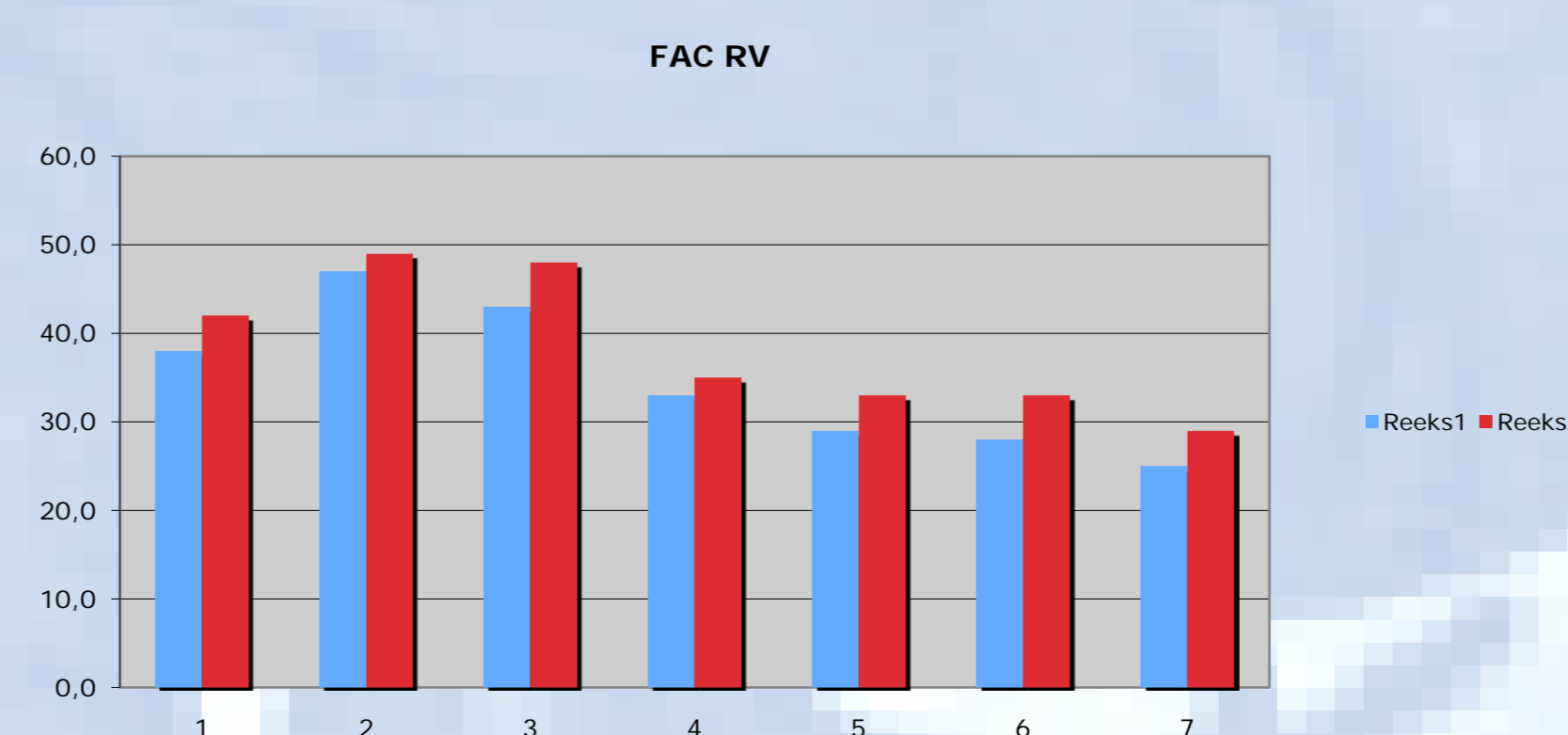


Results

The left ventricular ejection fraction [62.6(6.1) vs 56.0(5.7)%] and shortening area decreased during OLV as compared to TLV.



The right ventricular end-diastolic area increased, as well as the fractional area contraction. The tricuspid annular plane systolic excursion augmented (TAPSE) [1.9(0.2) vs 2.1(0.3) cm] and the TDI at the tricuspid valve decreased [5.7(1.5) vs 4.9(1.7)].



Only traces of tricuspid valve insufficiency were noted. Cardiac output, heart rate and mixed venous saturation remained constant.

Conclusion

We conclude that there is an adaptive, homeometric autoregulation of the heart function with impaired left diastolic filling. Further studies are needed to assess the effects of longer OLV.