Commentary

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One lung ventilation (OLV) is required during pneumonectomy, bronchoplastic resections and VATS, but is also beneficial and helpful in other thoracic procedures. The collapsed lung protects the parenchyma from mechanical injury and facilitates surgical access.

Mechanical ventilation may cause increased reactive oxygen species (ROS) production in response to shear stress and to cyclic mechanical stretch [1]. It was also shown that even moderate hyperoxia (FiO_2 0.5) is responsible for ROS generation and lung injury and these mechanisms of ROS production are probably synergistic [2]. The above-mentioned mechanisms occur during one lung ventilation in the dependent lung. In addition to ischaemia-reperfusion injury in the non-dependent lung they may be associated with pathological changes in lungs and occurrence of postoperative complications, but there is a paucity of data in the literature regarding this issue.

Another strong point of the published paper is the method choice of ROS generation assessment. Carbonyl measurement is regarded as a good marker for oxidative stress because of the coverage of a wide range of oxidative damage. Sulfhydryl groups additionally play a role in antioxidant cell defence. The measured differences in plasma concentrations of the remnants are proof of increased ROS generation during OLV [3].

The only question that appears while reading this paper concerns the influence of high oxygen concentrations on ROS production. The patients were ventilated with FiO_2 0.3-0.5 increased to 1.0 in case of hypoxemia. It remains unclear if increased FiO_2 was associated with higher ROS generation, and, in this case, if average FiO_2 was comparable in both groups.

Despite these doubts the subject is of great importance. The problem of influence of particular anaesthetics and methods of anaesthesia on the systemic postoperative inflammatory response and long-term follow-up is currently under investigation.

References

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2. Sinclair SE, Altemeier WA, Matute-Bello G, Chi EY. Augmented lung injury due to interaction between hyperoxia and mechanical ventilation. Crit Care Med 2004; 32: 2496-2501.
3. Cakatay U, Telci A, Kayali R, Tekeli F, Akçay T, Sivas A. Relation of aging with oxidative protein damage parameters in the rat skeletal muscle. Clin Biochem 2003; 36: 51-55.