In Reply.—We appreciate the interest of Dr. den Uil et al. in our article1 and thank the authors for their comments. They refer to their publication2 and point out some perceived differences between the studies.

Although the authors mention in their letter that our results are partly in contrast with their own findings using side-stream dark-field imaging during cardiac surgery, we suggest that both studies show rather similar alterations during cardiopulmonary bypass (CPB) for cardiac surgery. We found a transient 10% decrease of functional capillary density during CPB,1 and den Uil et al. reported a reduction of microvascular perfusion index and an increased proportion of pa-

The authors pointed out that difference in analysis routine exists: Dr. den Uil et al. used a semiquantitative analysis3 to calculate the microvascular flow index, whereas we assessed the microcirculatory parameters of erythrocyte velocity, vessel diameter, and functional capillary density using Cap-image (Dr. Zentl GmbH, Heidelberg, Germany). We do agree that automatic software to analyze routines must be well selected; however, Cap-image software is extremely well validated and has been frequently used in animal models using intravital microscopy.

In the current study, all parameters were analyzed manually: diameter by drawing a vertical straight line from one vessel wall to the other, erythrocyte velocity with the use of a line-shift diagram, and functional capillary density by marking all visual perfused capillaries in a selected video sequence. Moreover, we recently found a good correlation between functional capillary density analyzed with this technique and the procedure described by De Backer et al.,5 giving a correlation coefficient of 0.868 (our unpublished data, May 2007 comparison study of the analysis procedures as used by De Backer et al. and our analysis routine). Using this Cap-image diameter and erythrocyte velocity could not be analyzed in all microvessels because in this two-dimensional optical method, not all vessels in one region of interest are in focus. It has been discussed by Lindert et al.4 that using orthogonal polarization spectral imaging with a European phase alternating line (PAL) video standard, techniques hinder comparison of results obtained by orthogonal polarization spectral versus side-stream dark-field imaging and may explain the differential results. Second, the authors used software to measure microvascular diameter, erythrocyte velocity, and functional capillary density. In our study, a semiquantitative analysis technique was used. Although software can be helpful in decreasing the burden of a time-consuming semiquantitative analysis, we have to look critically at the numbers produced by the software. For example, we would like to learn from the authors whether it was possible to measure erythrocyte velocity in each investigated capillary and venule. Using Microscan Analysis Software (MicroVisionMedical, Inc., Amsterdam, The Netherlands), we experienced that it was impossible to measure high erythrocyte velocities that do exist in a substantial number of capillaries. This problem is probably due to a limited video frame rate: 25 frames/s for phase alternating line standard. Finally, several issues remain unclear after reading the authors’ article. The inclusion criteria used by the authors are not exactly mentioned. Did the authors investigate consecutive, low-risk patients? What was the estimated risk of surgery for the patient population (logistic European System for Cardiac Operative Risk Evaluation [EuroSCORE])? What were the incidences of postoperative morbidity and mortality? We think it might be interesting to investigate a possible relation between intraoperative hypoperfusion of the microcirculation and postoperative outcome. This might be studied in a subgroup of patients with impaired functional capillary density during cardiopulmonary bypass. In addition to this, we wonder why the authors did not separate venules from capillaries, using a cutoff of 20 μm.

To conclude, it is of interest to note that both studies reported moderate changes in the sublingual microcirculation that probably reflect a complex pathophysiology during cardiopulmonary bypass. It is expected that novel bedside imaging technology will simplify further microcirculation research in patients based on studies that were performed previously in laboratory animals.3,4 We should focus on the questions of which individual stimuli are responsible for the reported changes and whether these changes are of clinical significance. Larger studies, perhaps in high-risk patients, would be helpful to draw stronger conclusions.

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References


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To the Editor:—A 70-yr-old woman undergoing back surgery was intubated without difficulty using the light-guided Trachlight lightwand device (Laerdal Medical, Stavanger, Norway), which we use for routine intubations in our operating room. She was then placed in a prone position, with her head held with a ProneView® Protective Helmet System (Dupaco, Oceanside, CA). A gastric tube was placed transorally. At the end of the operation, the patient was extubated uneventfully and was transferred to a general ward. Nearly 1 h later, the foreign body was identified as being a chipped rail gear from the Trachlight lightwand device (fig. 1). Because the radiodensity of the fragment was approximately 80 Hounsfield units, very near that of fat (120 units), the detection of other fragments by computed tomography scanning seemed highly unlikely, regardless of their possible location. After close observation for 7 days, the patient was discharged from the hospital without apparent complication, and has been followed for 3 months without the development of adverse health events.

The lightwand device is a useful tool for a variety of situations, such as difficult or nasal intubations, in patients with facial or cervical fractures, or for intubations in presence of bleeding in the oral cavity.1,2 However, it has also been associated with complications, including heat trauma, and increased rates of sore throat, hoarseness, mucosal bleeding, dental trauma, and malposition of the epiglottis.3 The Trachlight is a light and handy instrument made of plastic. Although the manufacturer disallows the reuse of the wand, it has set no time limit on the reuse of the device. The authors have no conflict of interest to disclose.


References

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