



Microcirculatory perfusion is preserved during off-pump but not on-pump cardiac surgery

Submitted by Emmanuel Lemoine on Tue, 02/24/2015 - 15:44

Titre	Microcirculatory perfusion is preserved during off-pump but not on-pump cardiac surgery
Type de publication	Article de revue
Auteur	Koning, N. J [1], Vonk, A. B [2], Meesters, M. I [3], Oomens, T. [4], Verkaik, M. [5], Jansen, E. K [6], Baufreton, Christophe [7], Boer, Christa [8]
Editeur	WB Saunders
Type	Article scientifique dans une revue à comité de lecture
Année	2014
Langue	Anglais
Date	2014
Numéro	2
Pagination	336 - 41
Volume	28
Titre de la revue	Journal of Cardiothoracic and Vascular Anesthesia
ISSN	1532-8422

Résumé en anglais

OBJECTIVE: This study investigated the perioperative course of microcirculatory perfusion in off-pump compared with on-pump surgery. Additionally, the impact of changes in systemic hemodynamics, hematocrit, and body temperature was studied. **DESIGN:** Prospective, nonrandomized, observational study. **SETTING:** Tertiary university hospital. **PARTICIPANTS:** Patients undergoing coronary artery bypass grafting with (n = 13) or without (n = 13) use of cardiopulmonary bypass. **INTERVENTIONS:** Microcirculatory measurements were obtained at 5 time points ranging from induction of anesthesia to ICU admission. **MEASUREMENTS AND MAIN RESULTS:** Microcirculatory recordings were performed with sublingual sidestream dark field imaging. Despite a comparable reduction in intraoperative blood pressure between groups, the perfused vessel density decreased more than 20% after onset of extracorporeal circulation but remained stable in the off-pump group. The reduction in microvascular perfusion in the on-pump group was further paralleled by decreased hematocrit and temperature. Although postbypass hematocrit levels and body temperature were restored to similar levels as in the off-pump group, the median microvascular flow index remained reduced after bypass (2.4 [2.3-2.7]) compared with baseline (2.8 [2.7-2.9]; p = 0.021). **CONCLUSIONS:** Microcirculatory perfusion remained unaltered throughout off-pump surgery. In contrast, microvascular perfusion declined after initiation of cardiopulmonary bypass and did not recover in the early postoperative phase.

URL de la notice	http://okina.univ-angers.fr/publications/ua8315 [9]
DOI	10.1053/j.jvca.2013.05.026 [10]
Lien vers le document	http://dx.doi.org/10.1053/j.jvca.2013.05.026 [10]

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- [10] <http://dx.doi.org/10.1053/j.jvca.2013.05.026>

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