

Category : **Cardiovascular: Monitoring**

A276 - Microcirculatory tissue perfusion during general anaesthesia and non-cardiac surgery: an observational study using incident dark field imaging with automated video analysis

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Introduction:

Handheld vital microscopy allows direct observation of red blood cells within the sublingual microcirculation. Automated analysis allows quantifying microcirculatory tissue perfusion variables – including tissue red blood cell perfusion (tRBCp). We aimed to 1) describe baseline microcirculatory tissue perfusion in patients presenting for elective non-cardiac surgery and 2) test that microcirculatory tissue perfusion is preserved during general anaesthesia and non-cardiac surgery.

Methods:

In this prospective observational study, we measured sublingual microcirculation using incident dark field imaging with automated analysis at baseline before induction of general anaesthesia, under general anaesthesia before surgical incision, and every 30 min during surgery in 120 elective non-cardiac surgery patients (major abdominal, orthopaedic or trauma, and minor urologic surgery). We also performed measurements in young healthy volunteers.

Results:

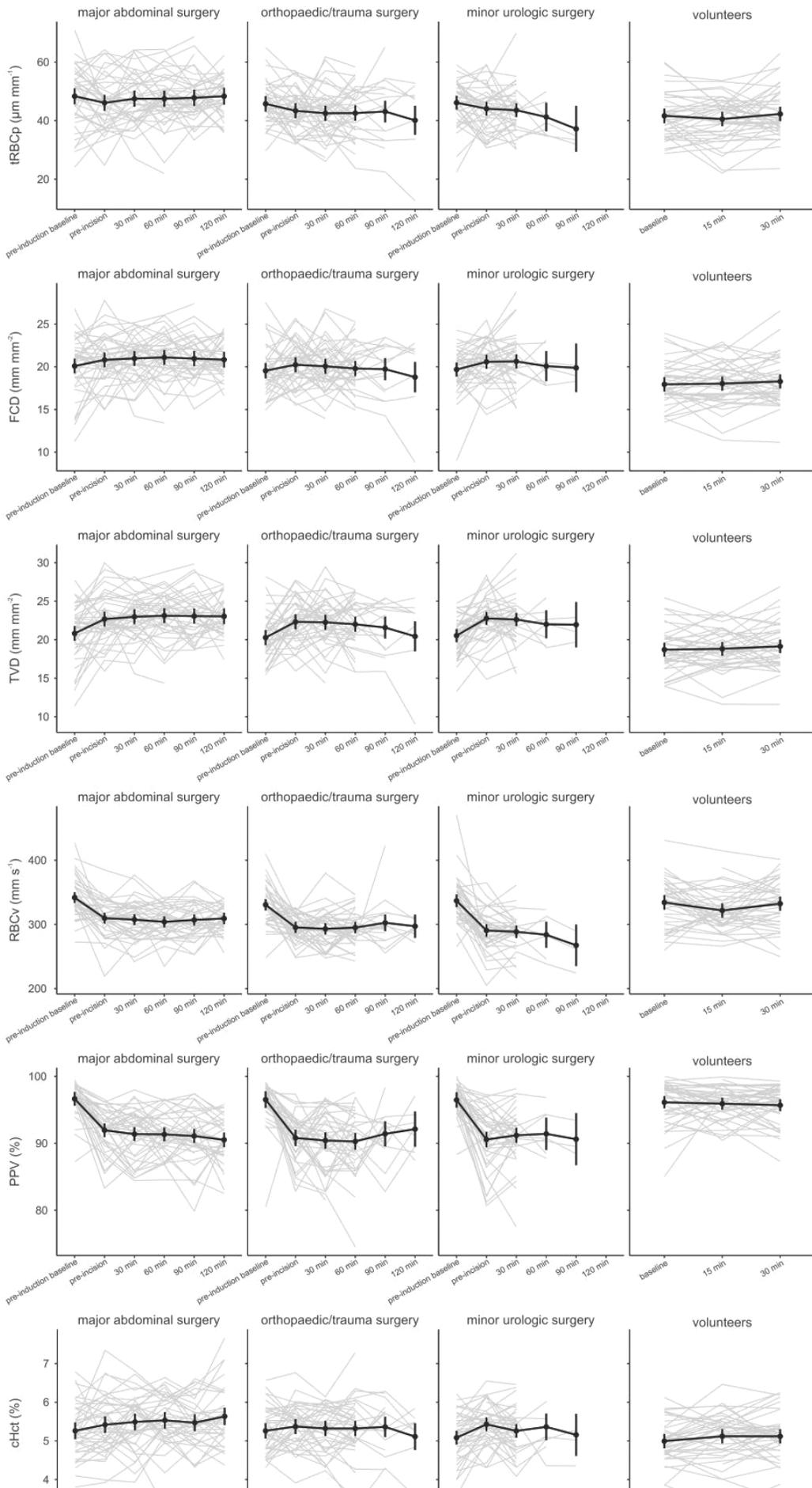
We automatically analysed 3687 microcirculation video sequences. Microcirculatory tissue perfusion variables varied substantially between individuals – but ranges were similar between patients and volunteers. Under general anaesthesia before surgical incision, there were no important changes in tRBCp, functional capillary density, and capillary haematocrit compared to pre-induction baseline. However, total vessel density was higher and red blood cell velocity and the proportion of perfused vessels were lower under general anaesthesia. There were no important changes in any microcirculatory tissue perfusion variables during surgery.

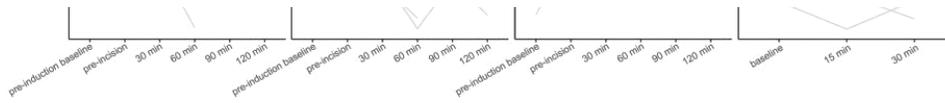
Conclusion:

In patients presenting for elective non-cardiac surgery, baseline microcirculatory tissue perfusion variables vary substantially between individuals – but ranges are similar to those in young healthy volunteers.

Microcirculatory tissue perfusion is preserved during general anaesthesia and non-cardiac surgery – when macrocirculatory haemodynamics are maintained.

Image :





Changes in microcirculatory tissue perfusion variables over time are shown as spaghetti plots for individual patients (grey) and as expected marginal means (black dot) and corresponding 95%-confidence intervals (black vertical lines) of the fixed effects. tissue red blood cell perfusion (tRBCp); functional capillary density (FCD); total vessel density (TVD); proportion of perfused vessels (PVD); red blood cell velocity (RBCv); capillary haematocrit (cHct).