Sidestream Dark Field imaging

Sidestream dark-field (SDF) imaging is a relatively new method allowing direct visualization of cerebral surface layer microcirculation using hand-held probe for direct contact with target tissue.

This method seems to be applicable in animal studies with possibility to use SDF imaging also intraoperatively, providing unique opportunity to study cerebral microcirculation during various experimental and clinical settings [1].

SDF imaging is validated by comparison to Orthogonal Polarization Spectral imaging. Nailfold capillary diameters and red blood cell velocities were measured using both techniques and equal quantitative results were obtained. An image quality system was developed to quantitatively compare the quality of sublingually-acquired microcirculatory images using OPS and SDF imaging. Venular contrast, sharpness, and quality were shown to be comparable for OPS and SDF imaging. However, capillary contrast and quality were shown to be significantly higher using SDF imaging. Venular granularity, in addition, was more clearly observable using SDF imaging [2].

Sidestream dark-field imaging allowed direct visualization of cerebral microcirculatory alterations in the operating room. This technique allowed the documentation of a significant blood flow reduction in the cortical microvascular and a decreased vascular density in patients with stroke compared with control subjects [3].

Although the analysis of pericontusional zone was difficult, there were fewer vessels than in the controls and there was no change in the flow. In the surrounding zone and in patients with subdural hematoma (SDH), They did not document alterations in the microcirculation. Direct imaging of cerebral microcirculation in traumatic brain injury (TBI) patients showed that despite serious brain injury the cerebral microcirculation was remarkably well preserved [4].

1)
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