

SIMULTANEOUS NON-INVASIVE TISSUE OXYGEN AND BLOOD FLOW MONITORING IN MICROSURGICAL FLAPS

Hölzle F^{*}, Franz E-P, Nolte D, Swaid S, Wolff K-D

Aims: Early recognition of microvascular flap failure is important for the outcome of the graft and for the decision on surgical revision in order to avoid the loss of the graft. Therefore, monitoring of microsurgical tissue flaps is of great clinical interest. The aim of this study was to investigate if early recognition of microvascular flap failure with this method is possible in order to avoid the loss of the graft.

Patients and methods: Since June 2002, 71 patients with microsurgical flaps (34 radial forearm flaps, 5 upper arm flaps, 6 vastus lateralis flaps, 26 osteocutaneous fibula flaps) underwent flap monitoring. Using O2C (LEA-Medizintechnik, Germany), we analysed non-invasively hemoglobin oxygenation (SO₂ [%]), hemoglobin concentration (Hb_{conc} [AU]), blood flow [AU] and flow velocity [AU] preoperative (donator region), intraoperative and up to the 14th day postoperative in different tissue levels.

Results: In eight flaps (11.3 %, 3 radial forearm flaps, 1 upper arm flap, 4 osteocutaneous fibula flaps) disorders of oxygenation and perfusion occurred. Two flaps recovered spontaneously, in three flaps surgical revision was necessary with two of the these flaps surviving. Altogether we lost four flaps.

Conclusion: Simultaneous non-invasive tissue oxygen and flow monitoring combines advantages of several other monitoring systems. O2C permits objective and early recognition of flap failure prior to clinical assessment. Because of its simple application and high sensitivity it is suitable for monitoring in free tissue transplantation.