

SIMULTANEOUS NON-INVASIVE FLUXMETRY AND TISSUE OXYGEN MONITORING IN FASCIOCUTANEOUS FLAPS

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abstract :

Early recognition of microvascular transplant failure is important for the outcome of the transplant. Aim: This study researches the usefulness of the tissue O₂ analysis system "O₂C" for non-invasive monitoring of tissue oxygenation in patients undergoing reconstruction with fasciocutaneous forearm flaps. Methods: For our research, "O₂C" (LEA-Medizintechnik, D-Giessen) was used permitting non-invasive measurement of blood flow, flow velocity, as well as hemoglobin concentration (Hbconc) and hemoglobin oxygenation (SO₂). Study protocols: (I.) Measurement of normal values in 5 volunteers in forearms and lower legs was performed at the elevation sites of fasciocutaneous forearm and osteomyocutaneous fibular flaps. (II.) Performance of the Allen manoeuvre and analysis of the above given parameters in another 12 test subjects. (III.) Recording of the parameters before elevation until 3 days after transfer of forearm flaps (n=5). Results: (I.) Flow, velocity, Hbconc and SO₂ in forearms and lower legs revealed no significant differences over an entire observation period of 3 days. However, there were differences in flow between the forearm and lower leg region (54 ± 5 vs. 34 ± 2 , mean \pm SEM, n=5, P<0.05). (II.) During performance of the Allen manoeuvre (n=12), there was a significant decrease of SO₂ and Hbconc in the ischemic period, followed by a rapid increase during reactive hyperemia. (III.) SO₂, Hbconc and flow tended to be higher in the transplanted forearm-flaps than under the in situ conditions. Conclusion: O₂C seems suitable for non-invasive measurement of tissue oxygenation and microvascular blood flow in fasciocutaneous flaps.

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