

Breast reconstruction using autologous tissue, current status and perspectives

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This PhD dissertation was accepted by the Faculty of Health Sciences of the University of Copenhagen, and defended on September 8, 2006.

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Dan Med Bull 2006;53:457

ABSTRACT

Breast reconstruction using autologous tissue is a standard procedure as an alternative to implants. Pedicle based flaps have been replaced by free flaps, and the number of perforator-based flaps has increased. We have a very limited knowledge of the physiological factors that determine the flap perfusion. The aims of this thesis were: 1) to evaluate the current status of autologous breast reconstruction at our institution, 2) to evaluate and use two physiological techniques to gain an insight into the flap physiology. The thesis is based on three clinical and three experimental studies and one related article in Danish.

The differences between the perforator-based flaps and the flaps containing muscle were small. The perforator flaps had a reduced donor site morbidity and a better abdominal strength was at the greatest work intensity.

The patient satisfaction was high. Flap type, adjuvant radiotherapy and patient age did not affect the aesthetic outcome.

Transit-time ultrasound could accurately measure the blood flow at all flow rates, but at low flow rates variation became a problem. Using tissue oxygen measurements we found that absolute O_2 -value and probe location was of little relevance for flap monitoring. The technique was sensitive and suited for subcutaneous monitoring. We examined whether a tissue flap could compensate for an acute reduction in blood flow and found the flap able to compensate for flow reductions up to 70 or 80%. Voltage activated calcium channels are likely to play a direct role in this autoregulatory process.

Future studies will focus on examining the importance of the perfusion pressure on the autoregulation. Clinical research will focus on the sensation after breast reconstruction and the ability to detect the donor vessels by a preoperative CT scan.