



Donor site morbidity and flap perfusion of subfascial and suprafascial radial forearm flaps: A randomized prospective clinical comparison trial



Claudia Schwarzer, Thomas Mücke, Klaus-Dietrich Wolff, Denys J. Loeffelbein, Andrea Rau*

Department of Oral and Maxillofacial Surgery, Klinikum rechts der Isar, Technische Universität München, Germany

ARTICLE INFO

Article history:

Paper received 27 October 2015

Accepted 27 June 2016

Available online 2 July 2016

Keywords:

Radial forearm flap
Donor site morbidity
Free flap perfusion
Free flap oxygenation
Monitoring free flaps
Flap harvesting technique

ABSTRACT

Purpose: The radial forearm flap is still the most commonly used free flap for the reconstruction of intraoral soft tissue defects. Flap raising can be performed in two ways: with or without integrating the fascia antebrachii into the flap.

Materials and methods: A prospective randomized study was performed, comparing the outcomes of 25 subfascial and 25 suprafascial radial forearm flaps. Flap viability was assessed clinically and by measuring flap perfusion parameters. Additionally, donor site morbidity was evaluated for 3 months after surgery. **Results:** Hemoglobin concentration was significantly higher in suprafascial flaps, whereas no difference in flap success rate was observed. No significant differences in donor site morbidity were found. Shrinkage of the full-thickness skin graft was tendentially higher in the subfascial group. Our results do not support the suggestion that subfascial flaps are associated not only with higher success rates but also with a higher donor site morbidity than suprafascial flaps. Despite relevant differences in flap perfusion, neither the flap success rate nor the donor site morbidity differed significantly.

Conclusion: Both supra- and sub-fascial dissection techniques are reliable methods of radial forearm flap raising, with little clinical difference between them.

© 2016 European Association for Cranio-Maxillo-Facial Surgery. Published by Elsevier Ltd. All rights reserved.

1. Introduction

Free flap transfer has emerged as the gold standard for the reconstruction of large tissue defects in the head and neck region. Despite the availability of other flap types, the radial forearm flap is still the workhorse flap for soft tissue reconstruction in the oral cavity (Zhang et al., 2015). One reason for the popularity of this flap type is the consistent anatomy of the donor site. Anatomical variations of the radial artery or its comitant veins are very rare, and the strong caliber of the vessels is well suited for microvascular anastomosis (Yang et al., 1997). Moreover, because of the simple anatomy of the radial forearm, flap harvesting does not require a high level of surgical expertise. Harvesting a radial forearm flap is, for

the most part, a standard surgical procedure that can be performed in two variations. The fascia antebrachii can be integrated into the flap, leaving only the paratenon above the tendons of the forearm flexor muscles (Fig. 1a). This technique, called subfascial flap raising, is the original technique first described by Yang et al., in 1979 and further popularized by Song and Gao in 1984 (Yang et al., 1997; Song et al., 1982). Despite the high success rates of this technique, the problem of relatively high donor site morbidity remains. Postoperative complications such as wound-healing disorders, exposure of tendons, and hypertrophic scarring are often observed and reduce patient life quality tremendously (Bardsley et al., 1990; Richardson et al., 1997; Brown et al., 1999; de Bree et al., 2004; Kerawala and Martin, 2006). An alternative way of flap harvesting can be performed by leaving the fascia antebrachii attached to the underlying tendons and muscles (Fig. 1b). This less commonly used technique is called suprafascial flap raising, and has been associated with reduced donor site morbidity but also with lower overall success rates (Chang et al., 1996; Lutz et al., 1999;

* Corresponding author. Department of Oral and Maxillofacial Surgery, Klinikum rechts der Isar Technische Universität München, Ismaningerstr. 22, D-82675 München, Germany. Tel.: +49 89 4140 5008; fax: +49 89 4140 4993.

E-mail address: andrea.rau@gmx.net (A. Rau).

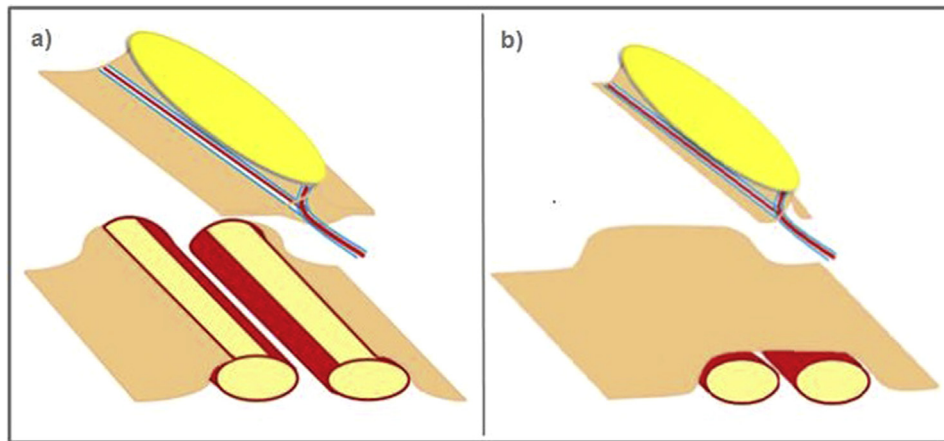


Fig. 1. Two methods of radial forearm flap raising: (a) subfascial, with integration of the fascia antebrachii into the flap; and (b) suprafascial, without integration of the fascia antebrachii.

Avery et al., 2001; Avery, 2007; Schaverien and Saint-Cyr, 2008; Chau et al., 2009; Avery, 2010). Since controlled studies on this issue are still missing, our objective has been to compare the two flap raising techniques in terms of flap viability and donor site complications.

2. Materials and methods

We performed a randomized, prospective, subject-blinded study comparing the outcomes of subfascial versus suprafascial radial forearm flaps. Based on prior sample size calculation, a group of 25 patients per study arm was chosen, resulting in 50 patients in total. Approval from the local ethics committee was obtained (Project Number: 263/14). Patient recruitment was conducted between April 2014 and May 2015 and included all patients with a diagnosis of invasive oral squamous cell carcinoma and the indication for soft tissue reconstruction with a radial forearm flap. Patients with a history of failing microvascular flaps or any functional impairment or scarring of the forearm donor site were excluded. Informed consent was obtained from all patients. Patients were allocated to study arm 1 (subfascial radial forearm flap) or study arm 2 (suprafascial radial forearm flap) by simple randomization. Different investigators were responsible for assigning patients to groups and for performing the medical examinations.

The standardized perioperative protocol was identical for both study arms and comprised of preoperative Allen-Testing, flap raising without tourniquet, and intraoperative subcutaneous application of 5000 units of heparin after completion of the anastomosis. Donor site closure was performed by using a full-thickness skin graft from the groin region. The full-thickness skin graft was sutured by the continuous suture technique supplemented by additional interrupted sutures with monofilament suture material. It was covered with a fatty gauze and a compression bandage made of foam material. Bandages and stitches were removed 10 days postoperatively.

Flap viability was surveyed on days 1, 2, 3, and 7 after flap transfer by clinical assessment and by means of the O₂C monitoring device (Oxygen-to-see, LEA-Medizintechnik GmbH, Gießen, Germany). The O₂C, which has been extensively described earlier (Hölzle et al., 2006, 2010), allows simultaneous and noninvasive measurements of hemoglobin oxygenation (%), hemoglobin concentration (AU = arbitrary units), blood flow (AU), and flow velocity (AU) at tissue depths of 2 and 8 mm by combining the techniques of laser Doppler spectroscopy and tissue spectrophotometry (Fig. 2).



Fig. 2. Placement of the O₂C measuring probe on the surface of a radial forearm flap used for tongue reconstruction.

Additionally, clinical examination of the forearm donor site was performed at 10 days, 6 weeks, and 12 weeks after flap transfer. Donor site investigation included documentation of wound-healing disorders (total or partial loss of skin, necrosis, seroma, infection, wound dehiscence), testing of sensory nerve function of the radial forearm and palmar skin, and measurement of the full-thickness skin graft. Both the patient and the examiner were asked to evaluate the overall esthetic outcome of the donor site based on a scale ranging from 1 (very dissatisfied) to 5 (very satisfied).

2.1. Data analysis

Data analysis was performed by using SPSS for Mac 22.0.0 (IBM Corporation; Armonk, NY, USA). Descriptive statistics are given as mean values and standard deviations. The Pearson χ^2 test was used for the analysis of donor site parameters. For significance testing of flap perfusion parameters, the Mann–Whitney U test was applied. The level of significance was set at $\alpha \leq 0.05$.

3. Results

In total, 50 patients with squamous cell carcinoma of the oral cavity and the indication for radial forearm flap transfer were included in the study; 33 were male and 17 female. The average

Download English Version:

<https://daneshyari.com/en/article/3141996>

Download Persian Version:

<https://daneshyari.com/article/3141996>

[Daneshyari.com](https://daneshyari.com)