



ELSEVIER



Comparison of abdominal wall morbidity between medial and lateral row-based deep inferior epigastric perforator flap

Hirokazu Uda*, Yoko Katsuragi Tomioka, Syunji Sarukawa, Ataru Sunaga, Yasusih Sugawara

Department of Plastic Surgery, Jichi Medical University, Shimotsuke, Tochigi, Japan

Received 3 April 2015; accepted 23 June 2015

KEYWORDS

Deep inferior epigastric perforator flap;
Abdominal morbidity;
Flexor trunk muscle ability;
Isokinetic dynamometer;
Medial row perforator;
Lateral row perforator

Summary *Introduction:* Although deep inferior epigastric perforator (DIEP) flap is associated with decreased abdominal morbidity, motor nerve damage during flap elevation cannot be ignored. We compared abdominal morbidity after elevation of DIEP flap with lateral row perforators (L-DIEP) and medial row perforators (M-DIEP) to determine the perforators associated with less abdominal morbidity.

Methods: Women who underwent breast reconstruction with DIEP flaps ($n = 49$) were included in this study. Among them, M-DIEP and L-DIEP were harvested in 27 and 22 patients, respectively. Pre- and postoperative trunk flexor muscle ability (at 3 and 6 months after surgery) was measured prospectively in all patients using an isokinetic dynamometer. The patients were also investigated for postoperative pain, stiffness, activity, bulging, and lumbago.

Results: At 3 months after surgery, a significant decrease in trunk flexor muscle ability was observed in the patients of the L-DIEP group, but they recovered well after further 3 months. However, the recovery tended to be weak. Similar results were obtained with respect to pain, stiffness, activity, bulging, and lumbago between the two groups at 6 months after surgery.

Conclusions: Dominant perforators for DIEP flap elevation should be chosen by considering flap viability. However, surgeons should be aware that elevation with L-DIEP is associated with a high risk of nerve injury, and may in turn result in short-term decreases in trunk flexor muscle ability. Therefore, precautionary methods should be taken by the surgeons to preserve the motor nerve with atraumatic dissection, especially during elevation with L-DIEP.

© 2015 British Association of Plastic, Reconstructive and Aesthetic Surgeons. Published by Elsevier Ltd. All rights reserved.

* Corresponding author. Department of Plastic Surgery, Jichi Medical University, 3311-1 Yakushiji, Shimotsuke, Tochigi 329-0498, Japan. Tel.: +81 285 58 7371; fax: +81 285 44 3234.

E-mail address: udaarare@jichi.ac.jp (H. Uda).

Introduction

Free deep inferior epigastric perforator (DIEP) flap breast reconstruction has become mainstream compared with conventional free transverse rectus abdominis musculocutaneous (TRAM) flap, because the former has been shown to have less abdominal wall morbidity.^{1–5} However, abdominal wall morbidity, such as bulging and hernia, can sometimes occur in DIEP flap elevation although the rectus abdominis muscle and its fascia are almost preserved. It was believed that damage to the intercostal nerve during flap elevation is the main reason for abdominal morbidity rather than the damage of muscle and its fascia.^{6–11}

Generally, DIEP flap is elevated with medial or lateral row perforators (M-DIEP or L-DIEP, respectively). Choice between the two perforators is made based on dominance, such as size and quality. However, Rozen et al.¹⁰ have documented that the intercostal nerve enters the rectus abdominis muscle from its posterior surface, which is generally located more medial than the L-DIEP. They suggested that the elevation with L-DIEP had a high risk of muscle denervation by nerve damage. However, their claim has not yet been clearly proved in a clinical setting. Generally, also the dissection of M-DIEP is often technically difficult and time-consuming, because it often involves a long and oblique intramuscular course leading to surgical damage of the muscle. Munhoz et al.¹² have documented that L-DIEP usually run in a rectilinear intramuscular course, which was shorter than that of M-DIEP. Therefore, they recommended L-DIEP by considering the safety and easiness of flap elevation.

If trunk flexor muscle ability decreases significantly after elevation with L-DIEP, as Rozen et al. have documented, we should choose M-DIEP when possible. However, if the trunk flexor muscle ability is not affected after flap elevation with the two perforators, we should choose the dominant perforator, without considering abdominal morbidity. Therefore, the aim of our study was to compare the abdominal morbidity between M-DIEP and L-DIEP by conducting prospective quantitative evaluations of trunk flexor muscle ability using an isokinetic dynamometer, in addition to qualitative evaluations (i.e., postoperative abdominal pain, stiffness, activity, bulging, and lumbago), to determine the perforator associated with less abdominal morbidity.

Materials and methods

A total of 103 consecutive patients underwent autologous breast reconstruction with abdominal free flap at Jichi Medical University Hospital between October 2007 and April 2014. Only selected patients ($n = 49$) who underwent a unilateral breast reconstruction using a single-pedicle true DIEP flap, in which the rectus abdominis muscle and its fascia were completely preserved, were included in this study (Table 1). Patients with elevated TRAM and double-pedicle abdominal flaps were excluded. We also excluded patients with single-pedicle DIEP flap harvested with both L-DIEP and M-DIEP. Furthermore, patients who had undergone initial open abdominal surgery or any underlying disease, such as diabetes mellitus and peripheral vascular

Table 1 Mean (standard deviation, SD) age and body mass index.

	<M-DIEP group> $n = 27$	<L-DIEP group> $n = 22$	p
Age (years)	47.6 (6.7)	49.8 (8.1)	0.294
Body mass index (kg/m ²)	23.7 (4.1)	22.5 (3.5)	0.834

disease, which might influence wound healing of the donor-site morbidity, were also excluded. There were no active smokers in this study. Of the 49 patients, 27 and 22 underwent elevation with M-DIEP and L-DIEP, respectively. All of them provided informed consent, and the study was approved by all the appropriate ethics review boards at our institution (Jichi Medical University, Reference number A14-060).

Choosing the perforator row and flap harvesting

In order to determine the dominant perforators and the course of deep inferior epigastric artery,¹³ preoperative contrast multidirectional computed tomography (MDCT) of the abdomen was routinely performed in all patients before the surgery. On the basis of the information, the surgeon chose the dominant perforators (i.e., M-DIEP or L-DIEP) to elevate the flap. In cases where both the M-DIEP and L-DIEP were dominant, the former was chosen when it was necessary to use the entire zone II of the flap for breast reconstruction. By contrast, L-DIEP was chosen for small breasts and when it was not necessary to use the entire zone II of the flap for the reconstruction. In all cases, the flaps were harvested by the senior surgeon (H. Uda) or any other surgeon under his supervision. The flap elevation procedure was performed with care to preserve the motor nerve of the rectus abdominis muscle. The fascia of the rectus abdominis muscle was almost completely preserved and repaired tightly by 2–0 Vicryl sutures. The reinforcement of the abdominal fascia by mesh repair was not performed for all patients. They were allowed to stand and walk, following the day of surgery.

Qualitative assessment of donor morbidity

In order to estimate the abdominal morbidity, an original grading scale, the abdominal pain, stiffness, and activity (APSA) scale, was created (Table 2). Patients were qualitatively assessed using this questionnaire at 6 months after surgery, at the outpatient department. At that time, the presence of abdominal bulging and lumbago was also investigated.

Quantitative assessment of donor morbidity

In each patient, the trunk flexor muscle ability was evaluated using a Biodex[®] isokinetic dynamometer (Model 2000, Multi-Joint System 3, Biodex Corporation, Shirley, NY, USA), which was considered to be a reliable measurement device

Download English Version:

<https://daneshyari.com/en/article/4117055>

Download Persian Version:

<https://daneshyari.com/article/4117055>

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