Journal of Plastic, Reconstructive & Aesthetic Surgery (2015) 68, 1112–1119

JPRAS
An International Journal of Surgical Reconstruction
www.JPRASurg.com

Early experience with the free lumbar artery perforator flap for breast reconstruction

Kevin T. Peters, Phillip N. Blondeel*, Fernando Lobo, Koenraad van Landuyt

Department of Plastic Surgery, Gent University Hospital, Gent, Belgium

Received 2 October 2014; accepted 31 March 2015

KEYWORDS
Breast reconstruction;
Perforator flap;
Autologous;
Lumbar artery

Summary *Background:* Autologous breast reconstruction has become a progressively more popular method of breast reconstruction. A wide variety of perforator flaps have been described and subsequently refined to decrease donor-site morbidity. Recently, the lumbar artery perforator (LAP) flap has been reported as an option for autologous breast reconstruction.
Methods: This study summarises the prospectively gathered data of 35 free LAP flaps for breast reconstruction in 28 patients. The mean follow-up was 18 months.
Results: The internal mammary artery and the venae comitantes were used as recipient vessels in all reconstructions. In 80% of the reconstructions (28 flaps), an interposition graft was used. Six flaps (17%) had to be revised for venous thrombosis. Two of the revised flaps (5.7%) could not be salvaged, and total flap necrosis occurred. The mean operating time was 6 h and 15 min, 6 h and 39 min when an interposition graft was used and 5 h and 23 min when no interposition graft was necessary.
Conclusion: The LAP flap should be considered as a further alternative for breast reconstruction in patients in whom a deep inferior epigastric artery perforator (DIEAP) flap is not possible or not desirable.

Shaping of this flap is easier compared to any other flaps due to the quality of the lumbar fat and the gluteal extension. An interposition graft is frequently used to facilitate anastomosis, either to lengthen the pedicle or to resolve size mismatch. This is a disadvantage of the LAP flap.

* Corresponding author. Department of Plastic and Reconstructive Surgery, University Hospital Gent, De Pintelaan 185, 2K12C, B-9000, Gent, Belgium. Tel.: +32 (0) 9 3323227; fax: +32 (0) 9 3323899.
E-mail address: phillip.blondeel@ugent.be (P.N. Blondeel).

http://dx.doi.org/10.1016/j.bjps.2015.03.031

Introduction

Autologous breast reconstruction has become a progressively more popular method of breast reconstruction since the 1990s. Primary reconstruction has proven to be an oncologic safe procedure with decreased psychological burden for patients with breast cancer (BRCA) compared to secondary or no reconstruction.[1,2] A wide variety of perforator flaps have been described and subsequently refined to decrease donor-site morbidity.[3–7] In 2003, a case report of the lumbar artery perforator (LAP) flap was described as an option for autologous breast reconstruction.[8] Since this case report, no large series have been described in the literature.

There have been several publications reporting the LAP flap as a pedicled flap for covering defects in the dorsal midline or in the lumbosacral area; however, its bulkiness limits its use in these indications.[9–12] The purpose of this article is to focus on the planning and the operative technique of the free LAP flap for primary, secondary or tertiary autologous breast reconstruction. Our early clinical experience with this flap is reported, and special attention will be given to donor-site closure and shaping of the flap.

Materials and methods

Planning of the procedure

All patients underwent a preoperative computed tomography (CT) angiography of the lumbar and thoracic regions showing the size, patency and position of the lumbar perforators and the patency of the internal mammary (recipient) vessels (Figure 1). The perforators are marked by the radiologist using a grid system with the midline being the *Y*-axis and the iliac crest being the *X*-axis.

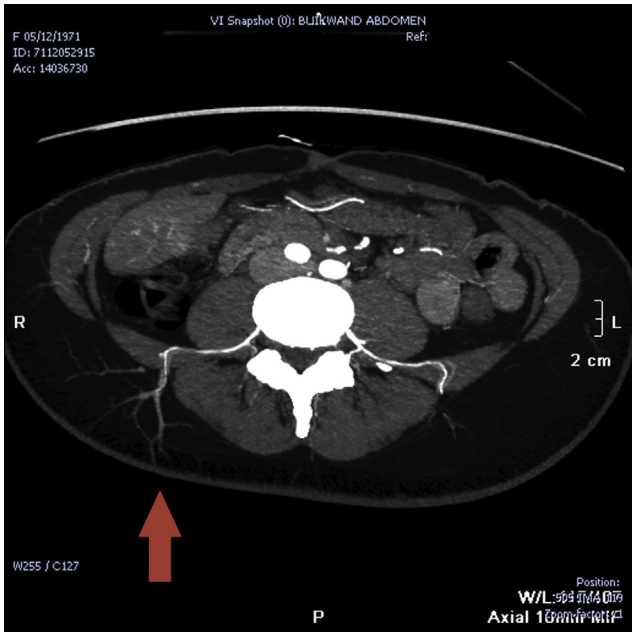

Figure 1 Classic CT angiography of a perforator of the fourth lumbar artery (arrow).

The patient is marked in a standing position. The posterior midline and the iliac crest are marked. The dominant LAP is selected based on the CT angiography (L3 or L4). The perforator is marked and confirmed by a unidirectional Doppler. A fusiform skin island is drawn over the perforators with the long axis in a slightly upward direction to resemble an upper-buttock lift scar. The drawings do not pass the midline, and they are designed to eventually meet up with an abdominoplasty scar laterally, as, for example, after deep inferior epigastric artery perforator (DIEAP) flap harvest (Figure 2).

The thoracic region is marked as described by Blondeel et al.[13]

Surgical technique

The flap can be harvested in a prone position (second author) or in lateral decubitus (last author).

Lateral decubitus

The flap is most easily harvested from the lateral to the medial with the surgeon standing at the posterior side of the patient. Lateral decubitus allows a two-team approach for the simultaneous preparation of the mastectomy site and for harvesting of a deep inferior epigastric interposition graft if necessary. The main reason for using an

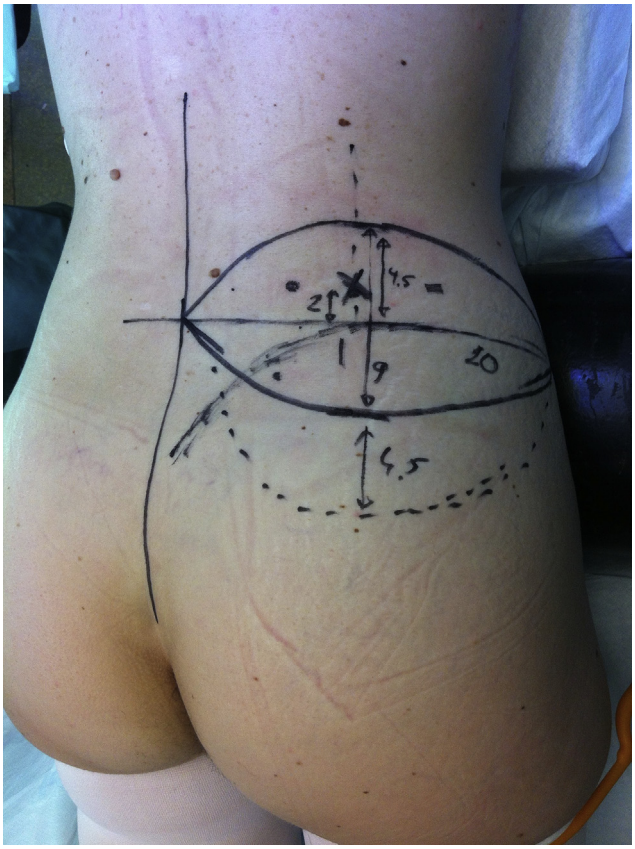

Figure 2 Preoperative markings of a lumbar artery perforator flap. Flap size: 9 × 20 cm, gluteal extension: 4.5 cm.