Journal of Plastic, Reconstructive & Aesthetic Surgery (2016) 69, 594—597

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

The dog-ear flap as an alternative for breast reconstruction in patients who have already undergone a DIEAP flap

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Received 15 July 2015; accepted 5 October 2015

KEYWORDS
Breast reconstruction;
Microsurgery;
Dog ear flap;
DIEAP flap

Summary Breast reconstruction in patients who have previously undergone deep inferior epigastric artery perforator flap (DIEAP) reconstruction or abdominoplasty is often challenging. Depending on patients' body habitus, several second-choice flaps have been described such as the transverse upper gracilis (TUG) flap, profundus femoris artery perforator (PFAP) flap, superior gluteal artery perforator (SGAP) flap, and lumbar artery perforator (LAP) flap.

Patients who have undergone a DIEAP flap reconstruction or abdominoplasty occasionally present with dog ears on both sides of the abdominal scar. The adipose tissue and skin of these dog ears are supplied by perforators of the deep circumflex iliac artery (DCIA). The DCIA flap was first described in 1979 by Taylor. We introduce this abdominal "dog-ear" flap for autologous breast reconstruction.

Introduction

Breast reconstruction in patients who have previously undergone deep inferior epigastric artery perforator flap (DIEAP) reconstruction or abdominoplasty is often challenging. Depending on patients' body habitus, several second-choice flaps have been described such as the transverse upper gracilis (TUG) flap, profundus femoris artery perforator (PFAP) flap, superior gluteal artery perforator (SGAP) flap, and lumbar artery perforator (LAP) flap.

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http://dx.doi.org/10.1016/j.bjps.2015.10.005

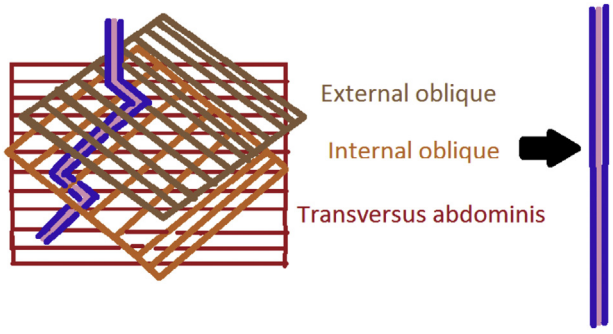

Figure 1 The "zigzag" pattern of the pedicle between the muscles of the abdomen. As the pedicle follows a zigzag course through the oblique external and internal muscles, the pedicle length can be increased by meticulously unraveling the pedicle from these muscles.

by Taylor.[6] We introduce this abdominal "dog-ear" flap for autologous breast reconstruction.

Aims

We present the dog-ear flap, which is an alternative for breast reconstruction in patients who have previously undergone DIEAP flap reconstruction or abdominoplasty.

Materials and methods

The study is a prospective review of four consecutive breast reconstructions using an abdominal dog-ear flap. All patients underwent a prior breast reconstruction with a DIEAP flap. In this article, we describe the harvesting technique, patient characteristics, and outcome. A preoperative computed tomography (CT) scan was performed for all patients to locate the perforator. The distance of the perforator from the iliac crest was noted by the radiologist.

Anatomy

The flank region is richly vascularized by a number of source arteries. Perforators from the DCIA; the superficial circumflex iliac artery; and the intercostal, lumbar, and iliolumbar arteries can be found close to this region.[1] The pedicle follows a zigzag course through the abdominal muscles (Figure 1). The ascending branch of the DCIA travels sandwiched between the transversus abdominis and the internal oblique muscles. The DCIA is a large vessel arising from the lateral or posterior surface of the external iliac artery, just above the inguinal ligament. The DCIA passes obliquely upward, parallel to the inguinal ligament, toward the anterior superior iliac spine (ASIS). Approximately 1 cm medial to the ASIS (after giving off an ascending branch that supplies the internal oblique muscle), the DCIA pierces the transversalis fascia and passes along the inner lip of the iliac crest. At the midpoint of the crest beyond the ASIS, the artery pierces the transversus abdominis muscle and anastomoses with the iliolumbar arteries. In its course along the inner lip of the iliac crest, the DCIA gives off several small perforators that penetrate the transversus abdominis, internal oblique, and external oblique muscles.[7]

In 2007, Steven Morris and his colleagues conducted a cadaver study to document all DCIA perforators. They located these perforators, on average, 5—11 cm posterior to the ASIS and 1—35 mm superior to the iliac crest. The average diameter of the perforator was 0.7 mm.[1]

Operative technique

First, the recipient side is prepared and the recipient vessels (mammary vessels) are dissected out in the supine position. Thereafter, the patient is repositioned in lateral decubitus to begin the flap dissection. The perforators are identified by preoperative CT. A handheld Doppler probe is used to confirm this location. An elliptical skin paddle is designed around this perforator including the lateral part of the abdominal scar of the previous DIEAP flap. In order to increase volume, while still enabling primary closure, an area to be beveled is marked around this ellipse (Figure 2).

First, the lateral border of the flap is incised down to the underlying deep fascia of the external oblique muscle. It is then dissected from the lateral to medial direction. The dominant perforator is identified and carefully dissected through the abdominal wall muscles. The diameter of the perforator increases significantly as it begins to dip into the muscle. The different orientations of the muscle fibers of the external and internal oblique muscles as well as the transversus abdominis muscle can be clearly identified. During intramuscular dissection, the side branches are

Figure 2 Positioning of the patient on the operating table. An elliptical skin paddle is designed around this perforator including the lateral part of the abdominal scar of the previous DIEAP flap. In order to increase volume, while still enabling primary closure, an area to be beveled is marked around this ellipse (area hatched).