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British Journal of Oral and Maxillofacial Surgery 51 (2013) 301–306

BRITISH Journal of Oral and Maxillofacial Surgery

www.bjoms.com

Free groin flap in hemifacial volume reconstruction

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Accepted 11 September 2012
Available online 1 October 2012

Abstract

Use of the free groin flap, one of the first microvascular free flaps described, has been neglected recently because it has a short pedicle and varies anatomically. However, we have found its anatomical features and type of tissue ideal for volumetric enhancement in severe hemifacial asymmetry. We present a retrospective review of a consecutive series of 14 patients who had hemifacial augmentation with a free groin flap (mean age at operation 17 years, range 10–42) since 2001, and discuss the surgical technique. The most common cause of asymmetry was hemifacial microsomia ($n = 6$). Anatomical variation of the vessels in the groin did not cause problems. Arterial anastomosis was to the facial artery in 13 patients; 12 patients had simultaneous hard tissue procedures. No flaps failed. The free groin flap is a useful adjunct in the management of hemifacial deficits in volume when free fat grafts will not provide enough bulk. Although the operation can take longer than non-vascularised grafts, little tissue is lost so long-term results may be more predictable. We have found the anatomy fairly consistent and the short pedicle caused no problems.

Keywords: Groin flap; Facial asymmetry; Romberg's; Hemifacial atrophy; Hemifacial microsomia; Goldenhar; Microvascular; Facial reconstruction

Introduction

The free groin flap was one of the first microvascular free flaps to be used,[1] but its use has been neglected in recent years because it has a short pedicle and varies anatomically more than other flaps. We have found it ideal for volumetric enhancement of the face in severe hemifacial asymmetry because of its anatomical features and type of tissue. The relatively short pedicle did not cause problems when anastomosing to neck vessels in the normal fashion. While augmentation of smaller volumes can be achieved with free (non-vascular) Coleman fat grafts, the free microvascular groin flap provides more bulk that can be adjusted to the desired shape and volume in situ.

We present a retrospective review of the case notes of consecutive patients from the craniofacial database and theatre records at the combined craniofacial surgery units of Great Ormond Street Hospital for Children and University College London Hospitals. We describe the surgical technique used to harvest and place the free groin flap to correct a deficit in soft tissue. The flap is our preferred method to address problems of facial asymmetry presented by conditions such as hemifacial microsomia, Romberg disease, and radiation-induced

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0266-4356/$ – see front matter
http://dx.doi.org/10.1016/j.bjoms.2012.09.004

growth disturbance when smaller volume non-vascular grafts do not provide enough bulk.

Technique

All patients are seen in regular multidisciplinary clinics that involve craniofacial, maxillofacial, and plastic surgeons, and orthodontists. Diagnosis is made in the normal manner, but we review patients with active disease such as Parry-Romberg syndrome using specifically indicated tests such as thermal imaging and bone scans. We prefer to defer definitive treatment until growth of the facial skeleton is complete or the underlying disease has burned out.

Operations are done under general anaesthesia under sterile conditions. The patient is laid supine and the face and groin are prepared in the standard fashion. Either side groin is suitable for each side of the face. The inguinal ligament is marked and the superficial circumflex iliac artery, typically found 2.5 cm below this, is marked along with the axial vessels (Fig. 1). Tumescent solution[2] is injected into the face and harvest site of the flap. A line joining the anterior superior iliac spine, the pubic tubercle, and the femoral arterial pulse is marked, and an incision made across it in the groin. Below this a suitable skin paddle is marked for harvest of the free flap. The incision can be extended superiorly if an iliac non-vascularised bone graft is required.

We raise the flap beginning medially with a vertical incision over the femoral vessels. The pedicle is identified (Fig. 2) and the dissection is then extended laterally. We prefer to start the dissection medially; the superficial venous system is identified, and the vessels are followed to the saphenofemoral junction. The superficial vein is preferred, as it tends to have a larger capacity. Dissection is then deepened and extended laterally and the superficial circumflex iliac artery is identified with the 2 venae comitantes. The artery can be small and short but this has not been a problem. It can be found roughly a finger's breadth below the inguinal ligament. Dissection is then done from lateral to medial; first above the fascia, then

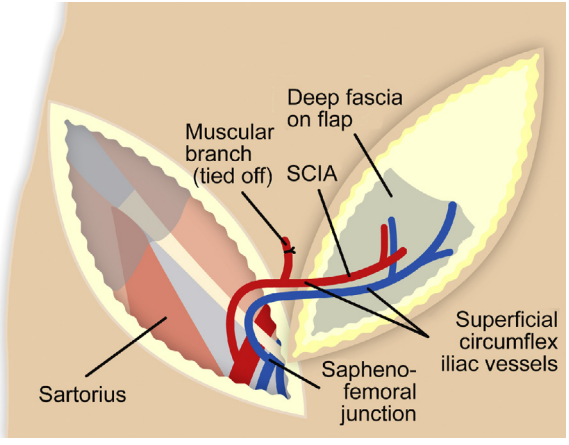

Fig. 1. Surgical anatomy of the free groin flap.

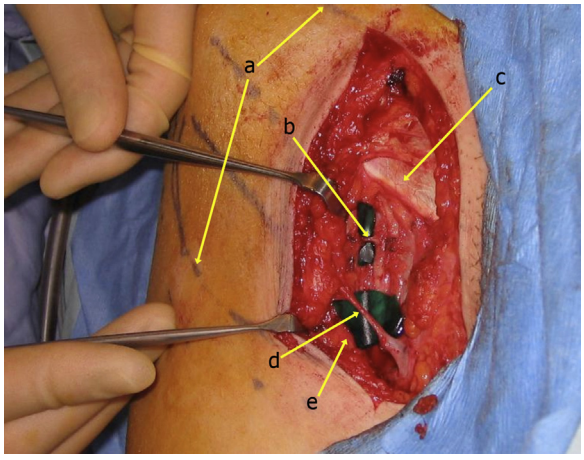

Fig. 2. Vessels identified: (a) upper and lower planned incisions (area between them is area of tissue taken); (b) superficial circumflex iliac artery; (c) inguinal ligament; (d) superficial circumflex iliac vein; (e) medial border of sartorius muscle.

deep to the fascia at the level of the sartorius muscle. The flap is de-epithelialised and the pedicles are dissected free medially. The flap is rested while the face and neck are prepared. At the time of transfer, the superficial circumflex vessels are ligated, and the groin is closed in layers over a suction drain.

On the face, a preauricular incision is made that extends into the hairline superiorly and the neck inferiorly. A superficial skin flap is raised to create a subcutaneous pocket, and is extended to just beyond the full planned extent of the position where the flap will be inserted; typically it might extend to the nasolabial groove. An access neck dissection is made, and suitable recipient anastomotic vessels are found, often the facial artery and facial vein. Any bony augmentation is done at this stage (before the flap is transferred to the face). The flap is then placed dermis side down to the face (Fig. 3) and is secured with multiple sutures to the underlying

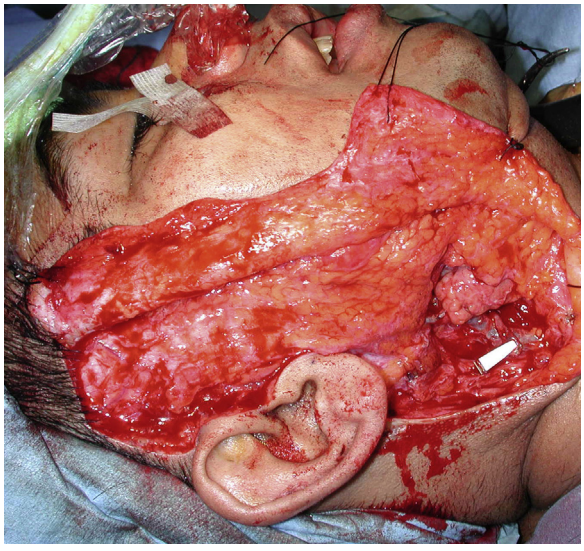

Fig. 3. Flap is placed and vessels are then anastomosed.