reconstruction is significantly more expensive than two-stage reconstruction. Our explantation rate is comparable to other studies assessing the success and tolerability of expander implants, showing explantation rates ranging from 25%—70%. The explantation rate for a single stage reconstruction should be ≤30% in order to be cost effective.

Conflict of interest statement

There are no conflicts of interests to disclose. There are no financial or personal relationships with other people or organisations that could inappropriately influence (bias) our work.

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The keystone flap alternative in posttraumatic lower-extremity reconstruction

Dear Sir,

We read with great interest the article « Bipedicled flaps in posttraumatic lower-extremity reconstruction » by Granzow et al.1 We congratulate the authors for this study and would like to share our experience in this type of trauma with the use of an other local flap described more recently, the keystone flap.

Currently, we have successfully used the keystone flap in 4 patients after gustilo II and III open fracture of the leg instead of a bipedicle flap.

In 2 patients it involved the middle third of the lower leg (Figure 1) and in the two others, the distal third. Three patients had exposed bone and one had a hardware exposure. The average defect size after debridement was 4.5 × 8.2 cm (range of 3.8–5.7 cm in width, 7.2–11 cm in length). The average time of flap harvesting was 14 min (range of 13–16 min). We did not observed suffering of the flaps or scar dehiscence.

Described in 2003 by Behan, the keystone flap still not widespreads and its use is mainly described in dermatological oncology.2,3 In these four patients, we performed a type I Keystone flap (Figure 2). However, in large defect, it is possible to use the type IIb, where the donor site is grafted as described by Behan.

We believe that the keystone flap has several advantages compared to bipedicled flaps:

First, the vascularization of this flap is twofold: Deep, by perforating skin vessels and lateral by preservation of subcutaneous longitudinal vessels on the edges. This makes it a robust and reliable flap. We never observed partial or total necrosis of the flap in our practice (over 80 keystone flaps) even in frail patients (diabetes, vascular disease). Bipedicled flaps seem less reliable and sometimes some areas may suffer.

When performing keystone flap, non preservation of a skin bridge may seem imprudent, but in reality Milton’s concept “an island is safer than peninsula” takes on its full meaning.4 In fact, the complete isolation of the island based on its skin perforating vessels would lead to a local sympathetic effect causing increased vasodilatation and thus optimized perfusion of the skin paddle. However, this theory is not really documented.

Second, in achieving bipedicled flap, a large subcutaneous dissection will result in a permanent alteration of perforating skin vessels in this area. In the event of keystone flap failure, no perforating vessels or major vessels have been injured during dissection, so all propeller flaps or other fasciocutaneous flaps are still achievable. In addition, the sensitivity of the skin paddle is perfectly preserved while the flap undermining achieved in...
bipedicled flap systematically leads to an alteration in skin sensitivity.

Performing a keystone flap is rapid and easy compared to microsurgical procedures. In the type I no graft is necessary, the two V-Y advancement at each end reduce the longitudinal tension, creating skin laxity and allowing in most cases a direct closure. A stretch effect of the skin flap is also reported.5

Ultimately, the savings in operative time and in length of hospital stay are to be considered in the therapeutic project as compared to free flaps. The real challenge remains to decide to perform or not a keystone flap on seeing a defect.

We did not found in the literature the use of keystone flap in open fractures of the leg. It is likely that in the future, this flap will occupy a place as well as bipedicled flap in the management of posttraumatic lower-extremity reconstruction. Finally, this flap could be considered as a first-line option when direct closure is unfeasible.

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Histomorphometry of dystrophic fat in a patient suffering Madelung’s disease

Dear Sir,

Multiple symmetric lipomatosis (MSL) is a rare lipid metabolism disorder characterised by multiple, symmetric, non-encapsulated lipomatous masses on the face, neck, shoulders, and upper arms with a tendency to infiltrates the normal subcutaneous layer.1 The disorder was first described by Brodie in 1846, then by Madelung in 1888, and finally by Launois and Bensaude in 1898.1,2 Although much remains unknown regarding the pathogenesis, it has recently been suggested to be associated with mitochondrial dysfunction.2,3 Two phenotypes are recognised: Type 1 MSL is characterised by symmetric fatty tissue on the upper body causing a “pseudo-athletic” appearance, and Type 2 MSL is characterised by the presence of pathologic adipose tissue that affects the entire body, resulting in the appearance of obesity.1,4 For the first time, we present the histomorphometry of MSL adipose tissue in comparison to normal tissue.

A 62-year-old man suffering from type 1 MSL was admitted to our department with large symmetric asymptomatic masses around the upper extremities, thorax, and abdomen. He reported that he had suffered from this condition for the previous 3 years, and he did not report alcohol abuse. Analysis of the liver function revealed an increase in the levels of gamma-glutamyl transferase and normal coagulation parameters. Nuclear magnetic resonance confirmed the presence of diffuse lipomatous masses around the upper arms, thorax, and abdomen. Written informed consent was obtained for surgical treatment and dystrophic tissue biopsies collected for the present study. The patient underwent hand-assisted liposuction of the thorax and lipectomy of the upper abdomen under general anaesthesia. Incisional biopsies were performed on the normal (thorax) and dystrophic subcutaneous fat (abdomen) (n = 3 per region) Figure 1. Recovery was uneventful and no recurrences were observed at a one-year follow-up. The tissue samples were fixed in 4% formaldehyde in phosphate-buffer (0.1 M, pH 7.4), dehydrated in graded ethanol and paraffin-embedded for light microscopic analysis. Digital photomicrographs of histological sections that were 6 μm thick and stained with haematoxylin and eosin were taken under a light microscope equipped with a 20× objective and a Eurekam 9 high-resolution video camera (BEL Engineering, Monza, Italy) interfaced with a computer running dedicated software (BELview, BEL Engineering). Ten randomly chosen micrographs, each corresponding to a test area of 65,700 mm², were collected from each specimen. The cross-sectional surface area of the adipocyte lipid vacuoles was measured using the free-share ImageJ 1.33 image analysis programme (http://rsb.info.nih.gov/ij) upon setting an appropriate threshold to only include the open adipocyte vacuoles. Vacuolar profiles ≤1000 mm², consistent with polar cross-sections, were systematically discarded. The data are reported as the mean values (±SEM) of the control and treated