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ARTICLE ORIGINAL

A new cost-effective and fast method of autologous fat grafting



Une nouvelle méthode économique et rapide de greffe graisseuse autologue

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Received 7 February 2016; accepted 10 April 2016

KEYWORDS

Human engineering;
Surgical procedures;
Fat grafting;
Lipofilling

MOTS CLÉS

Ingénierie humaine ;
Procédure chirurgicale ;
Transfert graisseux

Summary Due to the increasing number of fat grafting procedures, several laboratories have developed their own fat processing system (Puregraft[®], LipiVage[®], Viafill[®], etc.), such as closed harvesting systems, centrifugation or washing and filtration devices, or even simple decantation techniques. However, all these tissue-engineering systems are expensive. Our team has developed a simple and fast autologous fat grafting system, useable even for a large volume of lipofilling, and based on low-pressure suction and a sterile closed-system for processing the harvested fat tissue. It is a cost-effective system, as it only costs 9.28 Eur (10.52 USD) for a 500 milliliters autologous fat graft procedure.

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Résumé En raison de l'intérêt croissant des greffes graisseuses autologues, plusieurs laboratoires ont développé leur propre système de traitement de la graisse (Puregraft[®], LipiVage[®], Viafill[®], etc.), tels que les systèmes clos de prélèvement, les dispositifs de centrifugation et de filtration, de lavage ou même de simples techniques de décantation. Cependant, tous ces systèmes d'ingénierie tissulaire sont onéreux. Notre équipe a développé un système de greffe graisseuse autologue simple, rapide, utilisable même pour un grand volume de traitement, basé

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sur une aspiration à basse pression et un système clos pour le traitement du tissu adipeux prélevé. Il s'agit d'un système économique, car il coûte 9,28 EUR (10.52 USD) pour 500 millilitres de traitement de greffe de graisse autologue.

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Introduction

Fat grafting was described for the first time in 1893 by Neuber [1]. Recently, the demand for fat grafting, popularized by Khouri et al. [2] and Ho Quoc et al. [3,4], has tremendously increased, as therefore has the total expenditure (11,505 buttock augmentation with fat grafting in the USA in 2014, representing a total expenditure of 46,905,885 USD) [5].

There are many available techniques for harvesting, preparing, and re-injecting the adipose tissue. Due to the increasing number of fat grafting procedures, several laboratories have developed their own fat processing system: Puregraft® (Cytori Therapeutics, Inc., San Diego, California, USA), LipiVage® (Genesis Biosystems, Lewisville, Texas, USA), Viafill® (Lipose Corp., Maitland, Florida, USA), such as closed harvesting systems, centrifugation or washing and filtration devices, or even simple decantation techniques [6]. However, all these tissue-engineering systems are expensive.

Our team (mainly J. Rausky) has developed a new simple, fast, reproducible and cost-effective system for harvesting, processing and re-injecting autologous fat tissue.

Method

We listed all the required equipment for collecting, preparing and re-injecting the autologous fat and estimated its cost (Figs. 1 and 2; Table 1).

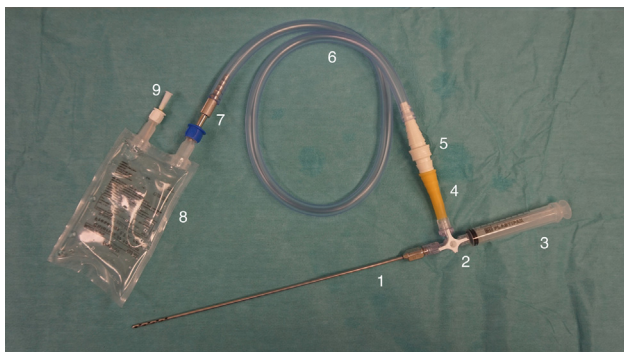


Figure 1 1: multiperforated harvesting cannula (4 mm; 12 port configuration) (JBMC, Beauselle, France – reference: 70710-12-25); 2: three way stopcock (BD, Temse, Belgium – reference: 394501); 3: Luer Lock syringe (10 mL) (BD, Temse, Belgium – reference: 300912); 4: universal adaptor (Coloplast, Rosny-Sous-Bois, France – reference: AK3100); 5: double taper connector (Vygon, Ecouen, France – reference: 881.00); 6: suction hose (cut to a length of 30 cm) (Cair/LGL, Civrieux-d’Azergues, France – reference: TA7301i); 7: impactor (JBMC, Beauselle, France – reference: 1180-ivs); 8: saline bag (100 mL) (Fresenius Kabi, Sèvre, France – reference: 3675129); 9: needle (16-gauge) (BD, Temse, Belgium – reference: 300637).

Setting up the system required to adapt a multiperforated harvesting cannula (4 mm; 12 port configuration) on a 10 mL Luer Lock syringe via a 3-way stopcock. A universal adaptor is connected to the 3-way stopcock and to a double taper connector itself connected to a surgical suction hose. The suction hose (cut to a length of approximately 30 cm) is then connected via an impactor to a 100 mL sterile saline bag, which was previously emptied using the impactor. A 16-gauge needle is inserted into the pocket in order to evacuate the air from the bag during the procedure (Fig. 1, Video).

The patient is put under general anesthesia, and the fat tissue is harvested from the excess fat areas after subcutaneous infiltration with epinephrine saline (one mg epinephrine in 500 mL of saline serum), in accordance with the superwet technique (defined as 1 mL of infiltration per 1 mL of aspiration) [7]. The liposuction is performed with a low-pressure suction through the 10 mL Luer Lock syringe. Once the syringe is filled, the fat is fed through the 3-way stopcock to the empty saline bag and an additional 10 mL liposuction is performed (Video).

Once filled, the 100 mL saline bag (that can receive up to 130 mL of fat tissue) is removed from the system and vertically placed to obtain decantation. Ten minutes of decantation are

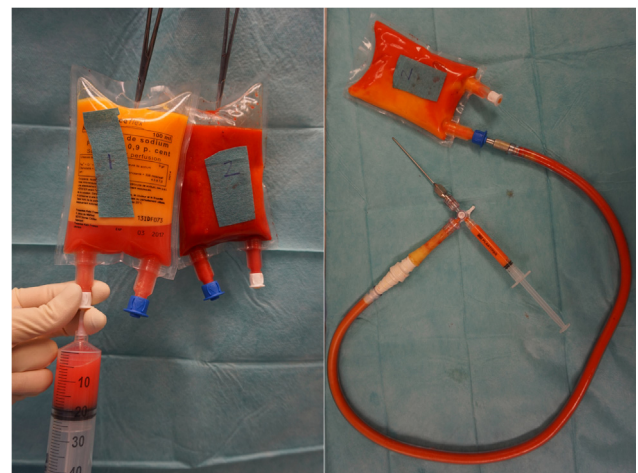


Figure 2 Left: the saline bag of 100 mL is vertically placed to obtain decantation (saline bag number two). Ten minutes of decantation are sufficient to separate the adipose phase from fluids and debris (saline bag number one). Fluids and debris are removed using a 60 mL syringe (BD, Temse, Belgium – reference: 300865) and a 16-gauge needle; right: the re-injection is performed by reconnecting the saline bag filled with re-injectable fat to the same system, the harvesting cannula being replaced with a re-injection cannula (Pourret Medical, Clichy, France – reference: PLA189) and the 10 mL Luer Lock syringe being replaced with a 3 mL Luer Lock syringe (BD, Temse, Belgium – reference: 309658).

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