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# "Lull pgm System" for Autologous Fat Grafting: A Simple Closed System with Minimal Equipment and No Extra Cost

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**Summary:** The "Lull pgm system" is a closed system for purifying harvested fat. It processes the collected tissue safely without any additional cost. The system was conceived by referring to the targets described in the literature with the aim of creating a simple system that guarantees a high standard of purification and requires minimal equipment that is available in every operating room. Cost must be always considered: even the most prosperous hospitals must keep within tight annual budgets. "Lull" can be used instead of expensive devices or disposable kits, without substantially increasing the operating time. The system has been used in clinical practice for many plastic reconstructive procedures and has obtained positive results and patient satisfaction, and no contraindications or disadvantages have been observed. *(Plast Reconstr Surg Glob Open 2016;4:e851; doi: 10.1097/GOX.0000000000000807; Published online 24 August 2016.)*

Autologous fat grafting is a widely used procedure in reconstructive and aesthetic surgery.[1]

Over the few last years, many authors have performed research studies with the aim of determining the most efficient fat processing technique, to improve tissue viability and reduce reabsorption rates.[2–4]

Although a universally accepted purification method has yet to be found, several authors concur that washing the harvested fat is a high-yield processing technique.[5–8]

According to the literature, closed system processing makes fat grafting safer because of lack of contact with air and contaminating agents.[9]

Our aim was to implement a purifying system, which is able to wash the harvested fat through a closed circuit, thus avoiding contact with air using simple and readily available materials.

Another important aspect to be considered is the cost of the equipment required: expensive machines and disposable kits may not be available in many countries. Moreover, even the most prosperous hospitals must keep within tight annual budgets.

Our method was implemented bearing in mind all of the aspects mentioned above.

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The "Lull pgm system" is a closed washing system: it purifies harvested fat effectively, makes fat grafting safer, and does not create any additional costs for the hospital.

## MATERIALS AND METHODS

Two 60-ml luer lock syringes; a harvesting cannula (length, width, and type according to surgeon's preference[10,11]); two 3-way luer locks; a lactate Ringer 500-ml bag; 2 disposable infusion sets, and a container for discharged fluid (Fig. 1) are required.

The two 3-way luer locks are connected to each other; subsequently, one lock is connected to the Ringer bag and the other to a disposable infusion set.

On the 3-way luer locks, there are still 2 places available to which 2 syringes are attached.

Thirty milliliters of adipose tissue (half a syringe) is collected with a 60-ml luer lock syringe (A) connected to a harvesting cannula.

Syringe A containing the aspirate is connected to the 3-way luer lock linked to the infusion set used for discharging.

A second empty 60-ml luer lock syringe (B) is added to the system through a 3-way luer lock connected to the Ringer bag. The luer lock infusion set of syringe B is open toward the Ringer bag and is closed toward syringe A. Thirty milliliters of Ringer solution is aspirated from the bag with syringe B (Fig. 2).

With a simple valve regulation, the solution is pumped from syringe B into syringe A through the valve system.

With a "lull" motion, an axial movement of the syringe A over 180 degree, the adipose tissue is gently

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**Fig. 1.** Minimal equipment required: two 60-ml luer lock syringes; two 3-way luer locks; a lactate Ringer 500-ml bag; 2 disposable infusion sets; a container for discharged fluid; an 1-ml or any other size luer lock syringe.

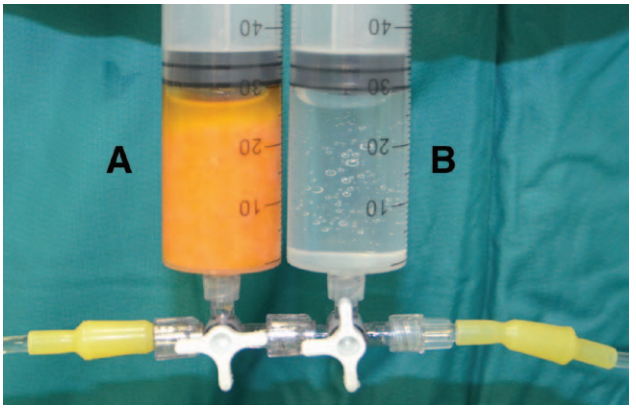


**Fig. 2.** Lull pgm system. Syringe A contains the harvested fat, ready to be processed. Thirty milliliters of Ringer solution is transferred from the bag into syringe B, which is then ready to pump the solution into syringe A.

washed with the Ringer solution (Fig. 3). After carrying out the lull procedure, syringe A is placed vertically, with the aim of separating the components by decantation. Using another luer lock infusion set, the solution containing blood cells and other contaminants (infiltration solution, fibrotic tissue) is washed out through the infusion set into a container.

This procedure can be repeated until the adipose tissue contained in the syringe A is sufficiently "clean."

Syringe A is now ready for adipose tissue transplantation.

The processed fat can be transferred into another 1-ml or any other size luer lock syringe by means of a 3-way luer valve (Fig. 4). The whole system is kept closed for all of these steps. The procedure can be repeated immediately, by replacing syringe A with another 60-ml luer lock syringe to be used for harvesting.

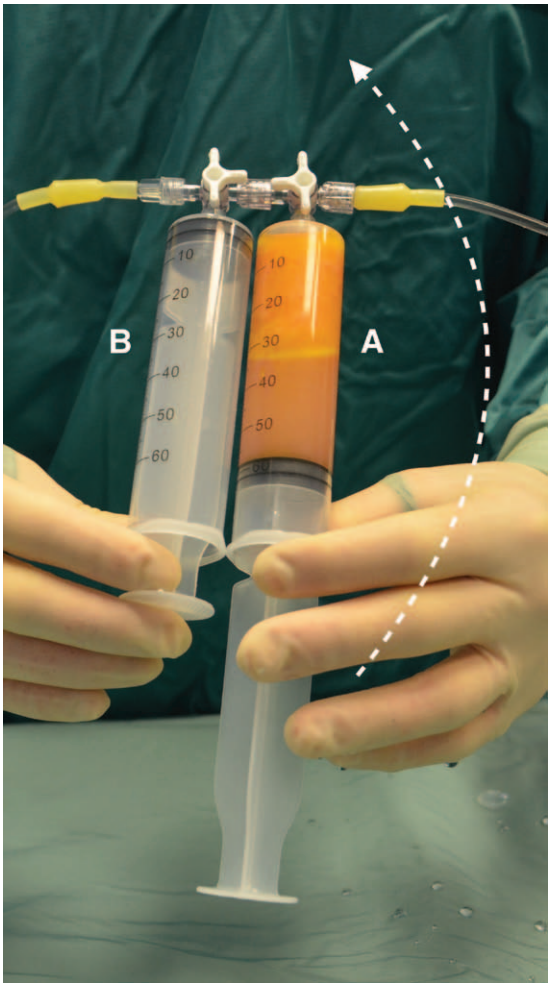


**Fig. 3.** The lull motion, an axial movement of the syringe A over 180 degree, gently washes the adipose tissue with the Ringer solution.

## RESULTS

This system has been used for many reconstructive and aesthetic procedures in various anatomical districts. Examples of reconstructive applications of Lull in fat grafting include scar contraction, wound healing, breast asymmetries, craniofacial abnormalities, and velo-pharyngeal insufficiency in cleft palate. Furthermore, Lull has been used for fat grafting in many other aesthetic procedures such as face contouring, face skin rejuvenation, lip augmentation, body contour reshaping, breast augmentation, and numerous volume restorations.

It has always been possible to carry out the procedure, regardless of the amount of tissue required for the operations. Positive results and patient satisfaction have been obtained, and no contraindications or disadvantages have been observed. Furthermore, no infection has occurred. Good results have been obtained regarding the absorption rates at patients' follow-up after the introduction of the Lull pgm system.

## CONCLUSIONS

Our method benefits from the closed techniques, decantation techniques, and washing techniques described

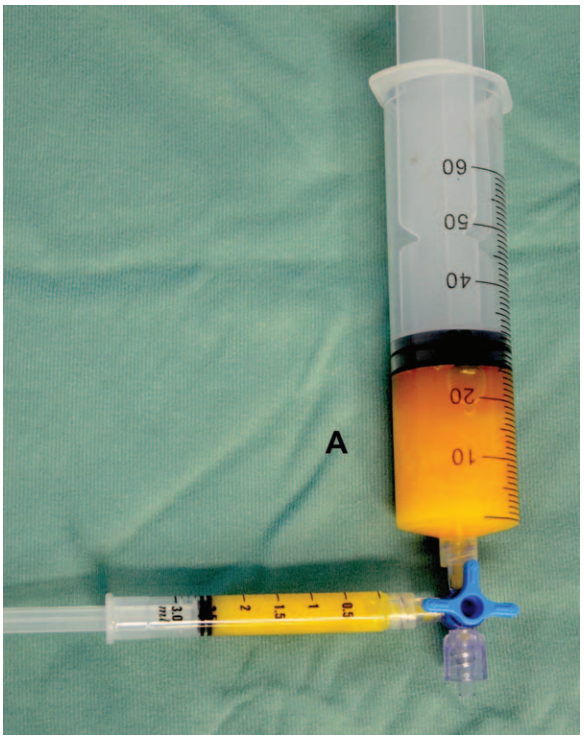


**Fig. 4.** The tissue in syringe A has been purified. Now it can be directly transplanted or transferred into another 1-ml or any other size luer lock syringe by means of a 3-way luer valve.

in the literature: the purification of the harvested fat from proinflammatory components, preservation of preadipocyte and mesenchymal stem cells, minimal stress for adipocytes, and safety of the graft.[6]

The costs generally incurred in the operating room have been significantly reduced since the introduction of our method: the equipment required is extremely inexpensive and no extra time is required for performing the operations, in fact operating times can sometimes be shorter. It is an operator-dependent technique, with a steep learning curve: once the basics have been interiorized, progress can be made rapidly. When processing the harvested tissue with our washing closed system, it is quicker to separate the fat from discharge materials compared with decantation in which they are separated only by gravity.

It has also been observed that the fat processed by decantation is less pure than when processed with our method.

With the Lull procedure, it is not necessary to wait until machines finish processing, and using only sterile materials has simplified the management of the operating room.

Furthermore, some nonsterile devices are not allowed inside operating rooms in numerous hospitals because of regulations.

After presenting the Lull pgm system, every surgeon will be able to follow the technique. The minimal equipment required can be found in every operating room; therefore, it is only essential to know how to perform this procedure.

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