

# Condensation of Tissue and Stem Cells for Fat Grafting



Shinichiro Kuno, MD, Kotaro Yoshimura, MD\*

## KEYWORDS

- Fat grafting • Cell assisted lipotransfer • Adipose-derived stem/stromal cell • Tissue regeneration
- Macrophages • Vascular endothelial cells

## KEY POINTS

- Adequate centrifugation purifies and condenses aspirated adipose tissue and improves graft retention.
- We can condense tissue by removing unnecessary components of grafted tissue through decantation, filtrations or centrifugation.
- Condensation of adipose-derived stem/stromal cells (ASCs) is important to get better adipocyte regeneration after fat grafting and achieve tissue revitalizing effects.
- ASCs can be condensed by reducing adipocytes from the graft through mechanical processing or strong centrifugation.
- Supplementation of stromal vascular fraction or ASCs can also improve ASC/adipocyte ratio in the graft and is expected to obtain better outcomes for tissue volumization and revitalization.

## INTRODUCTION

Adipose tissue has many types of cells other than adipocytes, which can be extracted as a cell pellet called stromal vascular fraction (SVF) through collagenase digestion of aspirated adipose tissue. SVF contains adipose-derived stem/stromal cells (ASCs), vascular endothelial cells, pericytes, adipose-resident macrophages, lymphocytes, and so on.<sup>1</sup> ASCs are regarded as a potent tool for cell base therapies because they have biological functions such as multidirectional differentiation, growth factor secretion, and immunomodulation, and can be obtained readily in a large amount through liposuction.

Condensation of grafting adipose tissue is a key to achieve better volumizing effects (better volume retention) by fat grafting. It is particularly important

when there is a limitation of injection volume (eg, breast) owing to the limited skin envelope, because an injection of excessive volume leads to severe ischemia and fat necrosis. Condensation of grafting fat can be achieved by means of removal of unnecessary components, such as water, oil, dead cells, and blood cells. Because aspirated fat tissue is relatively poor in stem cells (ASCs),<sup>2</sup> condensation of ASCs in the graft is another issue for seeking better volumizing effects.

Recently, regenerative effects of fat grafting are appreciated by many clinicians. Stem cell-depleted tissues such as irradiated tissue, chronically inflammatory tissue, and ischemic fibrous tissue are improved by fat grafting in quality, vascularity, and healing and expanding capacity.<sup>3,4</sup> It has been reported frequently that hypertrophic scarring and

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Financial Disclosure: Authors report no commercial associations or financial disclosures with regard to this article.

Department of Plastic Surgery, School of Medicine, University of Tokyo, 7-3-1, Hongo, Bunkyo-Ku, Tokyo 113-8655, Japan

\* Corresponding author.

E-mail address: kotaro-yoshimura@umin.ac.jp

Clin Plastic Surg 42 (2015) 191–197

<http://dx.doi.org/10.1016/j.cps.2014.12.006>

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