

Heparin-enhanced Harvest and Decanting for Autologous Fat Transfer

David Teplica, MD, MFA*†‡; Brent Robinson, MD‡

Dear Sir:

Autologous fat transfer has received well-deserved acceptance for a wide variety of clinical applications over the past decade. Opinions vary regarding optimal techniques for harvesting and decanting particulate fat. One consistent clinical observation and a simple change of technique may help improve fat grafting outcomes.

Approximately 20 years ago, the senior author tried adding several drops of heparin solution (5,000 u/mL) to each 35 cc harvest syringe and each 10 cc decanting syringe in a successful attempt to prevent fibrin plug formation, easing transfer of particles through small-bore cannulas (1.2–1.5 mm). Use of heparin also reduced fibrin formation in our protocol for nonliposuction mechanical morcellation of adipose.¹ Over the years, we realized that tissue separation using our heparin-enhanced gravitational protocol has been consistent and relatively rapid, without the concerns voiced by other surgeons about inadequate, inconsistent, and/or slow separation often seen with traditional gravitational decanting methods.

Recently, when several graft syringes failed to properly decant on the back table, we realized that those specific syringes had not been heparinized before harvest. A subsequent trial of otherwise mirror-identical harvests (Fig. 1) showed a dramatic difference in the efficacy of gravitational decanting between heparinized and non-heparinized syringes (Fig. 2). Ease of flow of the graft through a 1.5-mm cannula was also subjectively better in the syringe that had been heparin-primed. We hypothesize that both fibrin formation and cross-linking inside the decanting syringes are minimized with the addition of heparin, lessening or obviating the need for centrifugal force to separate liquids from solids. It is our experience that the lowered viscosity also eases flow during subsequent transfer (perhaps by lowering the plunger pressures needed) and likely enhances the ultimate uniformity of graft distribution.

Biologically, there is some evidence to suggest that heparinoids may also serve to protect native Fibroblast Growth Factor-2 in fat grafts from acid- and heat-inactivation, and from

protease degradation.² Because Fibroblast Growth Factor-2 is believed to stimulate the proliferation and differentiation of adipose precursor cells, low doses of exogenous heparin might enhance early revascularization and ultimately improve fat graft survival.²

We have seen no increase of ecchymoses or a single hematoma or seroma in the recipient sites for heparin-treated fat grafts in any of several thousand consecutive cases. Importantly, there have also been no deep vein thrombosis or pulmonary emboli in these same patients, who did not otherwise receive subcutaneous heparin or other anticoagulant during the postoperative period.

We suggest that formal quantification of heparin's effects on particulate adipose grafts could help further refine autologous fat transfer techniques and may also improve fat graft survival.

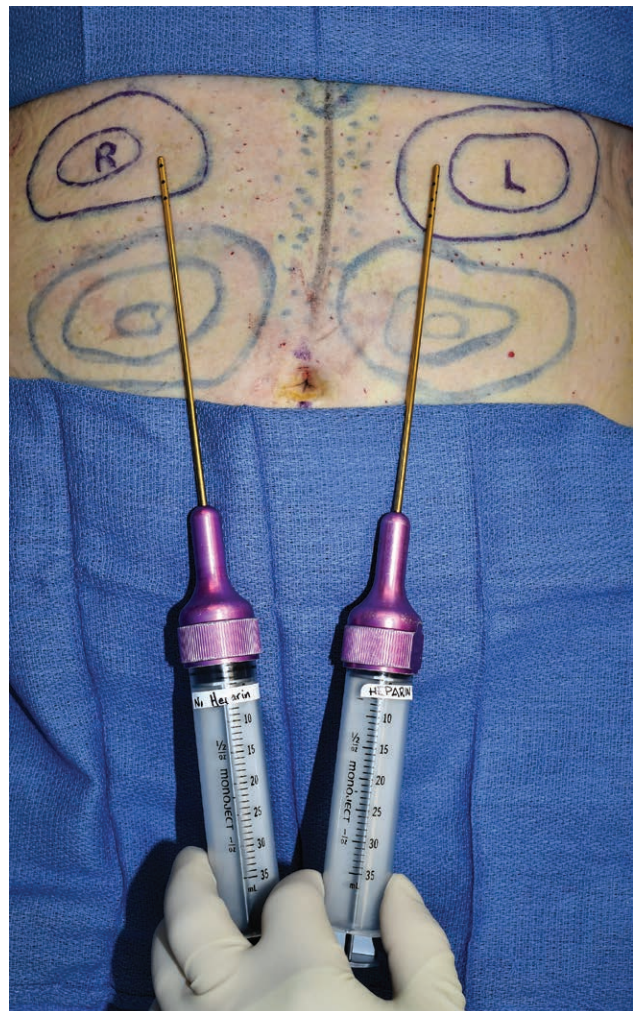


Fig. 1. Identical harvest equipment and mirrored anterior–inferior chest wall harvest sites.

*From the *Founding Director, The 803 Foundation, Chicago, Ill.; †Section of Plastic and Reconstructive Surgery, Department of Surgery, The University of Chicago, Chicago, Ill.; and ‡Department of Surgery, Presence Saint Joseph Hospital, Chicago, Ill 60657.*

*Copyright © 2018 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of The American Society of Plastic Surgeons. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal. *Plast Reconstr Surg Glob Open* 2018;6:e1690; doi:10.1097/GOX.0000000000001690; Published online 27 February 2018.*

Brent Robinson, MD

2900 North Lake Shore Drive

Chicago, IL

E-mail: brent01@gmail.com

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by The 803 Foundation of Chicago, Ill.

ACKNOWLEDGEMENTS

The authors would like to thank The 803 Foundation, the Marena Foundation, and the America Institute of Bisexuality, each for general project support.

REFERENCES

1. Teplica D, Bohorquez M, Podbielski FJ. Morcellized omental transfer for severe HIV facial wasting. *Plast Reconstr Surg Glob Open.* 2013;1:e73.
2. Nakamura S, Ishihara M, Takikawa M, et al. Increased survival of free fat grafts and vascularization in rats with local delivery of fragmin/protamine microparticles containing FGF-2 (F/P MP-F). *J Biomed Mater Res B Appl Biomater.* 2011;96:234–241.

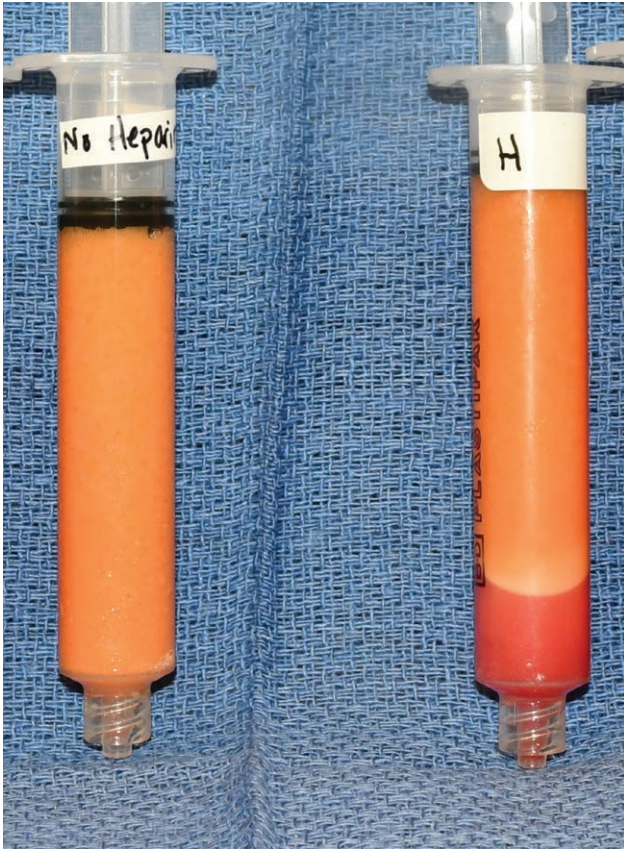


Fig. 2. Fifteen-minute vertical gravitational decanting without (left) and with (right) heparin added to both the harvest and decanting syringes. No centrifugation was needed.