Evaluation of the In Vivo Kinetics and Biostimulatory Effects of Subcutaneously Injected Hyaluronic Acid Filler

Sir:

We read with great interest the article by Mochizuki et al. entitled "Evaluation of the In Vivo Kinetics and Biostimulatory Effects of Subcutaneously Injected Hyaluronic Acid Filler."[1] This article reports the results of an investigation on changes in volume and histologic features of tissues after subcutaneous injections of hyaluronic acid into the dorsum of rats. It was noted that although, over time, there was flattening of the site of injection, the total volume did not change. In histologic studies, hyaluronic acid filler acted as a scaffold for self-tissue proliferation.[1] This occurred by fibroblast migration and proliferation that subsequently induced collagen production, angiogenesis and, ultimately, adipocyte proliferation. In conclusion, this study demonstrated that, even though hyaluronic acid is reabsorbed, the volume remains constant because of cell proliferation within the injected tissues.

Although, in human beings, the total volume is only partially maintained, the biological mechanism is the same. We know and we say to our patients that hyaluronic acid is reabsorbed within 6 months from the injection date, but the pleiotropic properties of this substance on the surrounding tissues are often not taken into account. The biochemical and biomechanical characteristics of hyaluronic acid on the tissue into which it is injected are the key to its popularity as a soft-tissue filler.[2,3]

In our opinion, the multiple effects of hyaluronic acid on the injected tissue must be fully known and should become an integral part of the knowledge of every physician who practices aesthetic medicine. Hyaluronic acid functions as an osmole, attracting and capturing large amounts of water. This is seen in the joint's lubrication and wound healing process. Hyaluronic acid is also known to act as an antioxidant, and by stretching tissue, it indirectly stimulates neocollagenogenesis.[4]

Moreover, in 2014, Paliwal et al. had already evaluated the cellular and molecular changes in skin as a secondary effect of cross-linked hyaluronic acid–based filler in a rodent model.[5] In this experiment, it was observed that the filler significantly increased the expression levels of collagen types I and II in rat dermal tissue for up to 12 weeks. An increase in dermal elastin was also reported after this treatment. In gene expression analysis, it was confirmed that extracellular matrix production and assembly were transiently up-regulated through gene expression up-regulation.[5] It was demonstrated, in this study, that hyaluronic acid filler enhances the production of several extracellular matrix components, including dermal collagen and elastin. In light of these studies and considerations, we think it would be of paramount importance to consider not only the percentage of reabsorption of hyaluronic acid filler, but also the production of new tissue stimulated by hyaluronic acid itself, partially replacing the reabsorbed amount.

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Andrea Sisti, M.D.
Daniel Boczar, M.D.
David J. Restrepo, M.D.
Division of Plastic Surgery and Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery
Mayo Clinic
Jacksonville, Fla.

Giuseppe Nisi, M.D.
Plastic and Reconstructive Surgery Unit
Santa Maria alle Scotte Hospital
University of Siena
Siena, Italy

Antonio Jorge Forte, M.D., Ph.D.
Division of Plastic Surgery and Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery
Mayo Clinic
Jacksonville, Fla.

Correspondence to Dr. Sisti
Mayo Clinic
4500 San Pablo Road
Jacksonville, Fla. 32224
asisti6@gmail.com

DISCLOSURE

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Reply: Evaluation of In Vivo Kinetics and Biostimulatory Effects of Subcutaneously Injected Hyaluronic Acid Filler

Sir:

We would like to thank Dr. Andrea Sisti and colleagues for their interest and thoughtful comments regarding our article. As they highlighted, hyaluronic