



Invited Discussion on: “Reverse Expansion Following Nipple Sparing Mastectomy: A Natural, Safe and Effective Autologous Technique for Breast Reconstruction”



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Regenerative plastic surgery is one of the most fascinating and seductive modern chapter in plastic reconstructive surgery. It opens a vast realm of possibilities to reconstruct parts or even whole anatomical regions of our body with our own tissues. One of the great, revolutionary achievements in medicine was the discovery of the regenerative power of the adipose tissue containing the mesenchymal adipose derived stem cells-ADSC (progenitor cells), the stem cell's niche and other regenerative factors [1, 2].

Plastic surgeons started to use and to observe the benefits of fat graft in their daily practice many decades ago—used mainly for face improvements and scars—but the scientific explanations and evidences were to be revealed more recently [3, 4]. The adipose tissue is one of the richest and good quality source of regenerative cells [5]; we owe recognition for the tremendous solid scientific research—the base of understanding and further development of our plastic surgical art—to Futtrell, Zuk, Yoshimura, Rigotti, Coleman, Mazzola, Rubin, Pallua, Alt, Magalon, Khouri, Biggs—just to name a few. Among these researchers we recognize also renowned plastic surgeons as a perfect demonstration of the value and validity of the translational

medicine “from patient's bed to bench side and from bench side to patient's bed”. As a consequence of this scientific and practical fertile environment, new indications, new techniques, new concepts, new instruments and equipment were born. The Italian school of regenerative plastic surgery based on fat transplant—including the breast—is internationally renowned by the contributions of Rigotti, Mazzola, Berrino, Calabrese, Bassetto, Botti, Pelle Ceravolo and of course Giorgio Fischer—one of the fathers of liposuction and fat graft. This concept was embraced and put into practice brilliantly by our Italian colleagues Elena Lucattelli, F. Catin, F. Cipriani, Laura Dellachiesa, T. Fogacci, G. Frisoni, D. Samorani, G. Semprini, L. Fabiocchi.

The authors of this relevant article demonstrated—based on their surgical experience of eleven years and more than one hundred surgeries—that the breast reconstruction with fat transfer is one of the most appreciated both by patients and surgeons [6]. Applications of regenerative surgery has multiple advantages: the method of reconstruction is gentle, painless, even desired for reasons such as weight reduction and reshaping, recreating a natural, sensitive and warm breast, looking similar with the contralateral breast, improving the vascularization and the vitality of the irradiated breast, with rapid hospital discharge, with minimal to no complications due to avoiding undermining and large scalpel wounds, without the immediate and delayed risks of the musculo-cutaneous flaps [7–10].

In a similar manner, Manconi, Berrino and colab. Describe a fat grafting technique after internal expansion and expander removal. Their method differs by using body jet system in which the lipoaspirate is separated in reservoir with internal filters (without the need of centrifugation). Similarly, a median of three fat grafting sessions were needed [11].

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The breast reconstruction with sequential fat grafting filling the space created with reverse expansion also has an economical merit: it is a medical resource sparing method. The benefits of using this particular method in oncological centers could be multiple: no need for intensive care or long hospitalization, no need for blood transfusion or other expensive postoperative care (a frequent need in the reconstruction with musculo-cutaneous flaps), sparing also human resource due to rapid discharge—all very important facts in decongesting the medical system, so burdened nowadays globally with the patients with Covid-19 or other pathologies.

I have been working as a practitioner and researcher with other colleagues in this specific breast regenerative surgery field since 2003; my experience in breast reconstruction by means of regenerative agents was reflected in some publications [12]. From personal experience we are able to confirm author's conclusions that the advantages easily counteract the disadvantages in this type of breast reconstruction post mastectomy.

As an original contribution, together with scientists specialized in microbiology, we demonstrated (in vitro) that the CO₂ fractionated laser application (set on 9 Watts, 4 milliseconds, large pattern) on the skin with transferred fat stimulates the ADSC, contributing to a better intake of the grafted fat [13].

Although not many and not so important, the disadvantages need to be known from the beginning, in order to prevent the complications as much as possible and in case they appear to have a plan of their management. The disadvantages of this method—which I and my team observed through the years—consist mainly in: the length of the treatment of the serried surgeries (2–3), the risk of lumps—cysts of necrotic or devitalized/non-vascularized fat, the lack of projection of the new breast and the lack of predictability of fat intake [14]. The macro/micro dystrophic calcifications can appear after fat grafting (from our experience this happens quite often); they are easy to differentiate from malignant micro calcifications but the patients should be warned about the possibility of developing lumps, in order not to panic. This aspect was hardly discussed in the article; we appreciate that it is important for the patients' understanding and eventually for the informed consent before proceeding to this extremely valuable therapeutic option.

Another aspect that looks important to us and apparently was not taken into consideration is the case when the contralateral breast is ptotic and/or hypertrophic. In these cases, a correction of the breast of reference (the contralateral breast) could be beneficial for the patients and should be offered in the surgical strategy, in the same logic of creating two beautiful, non-ptotic and healthy breasts. From our experience, patients agree to improve the status

of the healthy contralateral breast by reduction or pexy. Reproducing with fat graft a smaller breast will be easier to achieve, in this way also sparing the resources to reconstruct an unnecessary big, possible less healthy and surely less aesthetic breast.

All the disadvantages of the method must be clearly explained to the patients in order that they understand and assume the less favorable outcomes. Regarding the oncogenic concerns related to the method—especially in oncologic patients—this article offers an excellent opportunity to update and re-iterate the safety of fat transfer. The safety of grafted fat that cannot and doesn't generate breast cancer is once more demonstrated through direct follow-up of the cohort of the patients enrolled in this study for a median five years and also through a “fresh” review of the literature.

The success of this type of reconstruction is related to the grade of mastering the technique of fat microtransplantation, the vascularity of the recipient area and the quality of fat. The method may look simple at first site but for obtaining optimal results, it requires a learning curve, continuous training in the field of regenerative plastic surgery, surgical skills and proper equipment.

In conclusion, the possibility of breast reconstruction using fat grafting offers the benefits of a safe, efficient, mild, “resources sparing” method, while at the same time using regenerative cells that contribute both in healing and reducing the risks associated to radiotherapy and also offering a natural result without the need for further surgical revisions.

Declarations

Conflict of interest The authors declare no conflicts of interest to disclose.

Ethical Approval This article does not contain any studies with human participants or animals performed.

Informed consent For this type of study informed consent is not required.

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