Fillers and Injectables: A Historical Perspective

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As a dermatologist in private practice, I am honored and humbled by the opportunity to share my filler "journey" with esteemed colleagues and friends in the dermatology community. My first experience with dermal fillers dates back to 1988, while a dermatology resident at the University of Miami School of Medicine. Collagen injection workshops under the tutelage of Fredric Brandt, one of the true giants in the arena of cosmetic injectables, and a colleague to whom so many of us are indebted for his role in enhancing our understanding of facial aesthetics, were a far cry from what I had envisioned to be a part of my formal dermatology training.

From my perspective, our time and focus were best reserved for serious diseases such as AIDS and its many cutaneous manifestations, skin cancer, and incompletely understood diseases like psoriasis. With all due respect and deserved recognition to Arnold Klein, a pioneer and leader in the use of injectable collagen,[1] intruders like the *Paris Lip* belonged elsewhere, not in the domain of the highly sought-after and competitive dermatology residency. After all, dermatology, with its roots in internal medicine, was real medicine, making dermatologists, real doctors. Fast forward to 2014, and although a minority may still hold on to the belief that aesthetics does not belong in the realm of dermatology and dermatology residency, a look at the program content of the many conferences sponsored by our specialty societies (eg, AAD and ASDS) in conjunction with the table of contents of any number of our journals, indicate otherwise. Aesthetic medicine is very real and a very real part of dermatology, a specialty so intricately linked to the visual and, as such, capable in its undeniable ability to impact our perceptions of self and others. After all, how many specialties are capable of affecting self esteem?

To that end, powerful medicine must be grounded in powerful science. As with anything, the quest for a deeper understanding inevitably leads to more questions. In her guest editorial for the JDD September 2012 Fillers issue, Amy F. Taub notes "In the United States we have a paltry number of filler brands compared with the rest of the world."[2] I would add that the relatively few filler brands that we have in the US each possess unique qualities that make them particularly suited for certain applications. In the same editorial, Amy Taub states "although not an overlooked area, the upper face/cheek area should have more primacy in the consultation on fillers." The approval of Juvéderm Voluma® (Allergan) in the fall of 2013 has gone a long way not only to open the door to this important conversation with patients but to highlight the importance of addressing the cheek area when designing a facial rejuvenation treatment plan for patients who complain of nasolabial folds and under eye hollows/tear troughs.

My private practice experience with fillers begins in 1996 with Restylane®, introduced by QMed that year and available in Mexico City where I lived and practiced from 1991-1999. In truth, it was a patient who first told me about injections of hyaluronic acid, the latest treatment for unwanted facial lines. With the arrogance of a US-trained and board-certified dermatologist living abroad, I suggested that she was probably referring to collagen and informed her that hyaluronic acid was a sugar-derived compound capable of holding 1000 times its weight in water, a property that made it especially well suited for inclusion in topically applied cosmetics. Despite the absence of Google searches whether on the computer or smart phone, I somehow learned all about the hyaluronic acid (HA) filler Restylane® and rapidly incorporated it into my growing armamentarium of tools (that already included carbon dioxide ablative laser resurfacing and botulinumtoxinA) to address the aging face.

How had we managed to overlook volume as a critical piece of the puzzle? Even more fascinating is something else I recently learned while attending an advanced injectables workshop led by Brazilian plastic surgeon Mauricio Di Maio: the effect of adequate structural support on muscle function. I had never thought about this relationship, having compartmentalized the applications and indications of fillers and neuromodulators. Di Maio frequently reminds us to go "back to the basics," referring to a thorough knowledge of facial anatomy and the interdependence of muscles, soft tissues, and bone. An invaluable resource is a brilliantly thought out and beautifully articulated discussion by Rebecca Fitzgerald and Danny Vleggaar in which they examine facial aging as the result of volume loss largely due to loss of craniofacial skeletal support of overlying soft tissue.[3] Facial assessments, patient consultations, and injections now take me much longer than they did years ago during the days of blissful ignorance. The more I know, the slower I go.

As our knowledge and understanding of the complexities of facial aging improve, our initial approach of filling lines has been replaced by the more modern approach of volume replacement to restore facial contours. But what about those lines that patients bring to our attention? Do we really have to choose between lines and contouring? For example, in the notable absence

of collagen fillers in the US market, we can leverage the cohesive polydensified matrix found in Belotero Balance® (Merz) for the treatment of etched in or in areas where superficial placement of filler is desirable. It is in this spirit that I would like to share with you what fillers I use in my practice and why, with a focus on what I consider to be the strengths of each.

The year is 1996, and by now, I am quite comfortable with combining ablative laser resurfacing for improving the cutaneous aspects of photodamage and Botox (the only neuromodulator available to me in Mexico at that time) pre- and post- resurfacing to keep lines away. Proud of the smooth, even toned, wrinkle-free skin of those who trusted me with their cosmetic needs, it was not hard to overlook an element that was missing but not evident in the well documented two-dimensional before and after photos. It took only a glance at the profile and oblique views of these satisfied patients to see the obvious – the absence of that fullness inherent to the youthful face.

The introduction of the hyaluronic acid filler, Restylane®, was effortless in a practice comprised of savvy patients who wanted the latest and greatest; and the premise of using a substance so similar to one found in our bodies to be able to correct folds and lines that did not respond to other technologies made perfect sense to them and required little explanation from me. I embraced Restylane and, later Perlane®, with gusto, confidently treating nasolabial folds, marionette lines, and lips.

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Not surprising, solving one problem was accompanied by the emergence of new challenges. Why were some nasolabial folds bottomless pits that no amount of filler seemed to correct? Why did the appearance of tear troughs worsen in some people after treatment of their nasolabial folds? I made note of these and other puzzling observations and put them into my “I’ll think about this tomorrow” file.

Our family relocated to San Antonio, Texas, in July 1999, and the culture shock that awaited me was professional, not personal. Although readily available, Botox was not yet FDA approved for cosmetic use, and HA fillers were not even on the horizon or vocabulary of the private practitioner. During this aesthetic “famine,” I continued to travel to Mexico City to treat patients every few weeks and continued to gain expertise with HA fillers. It was probably 2002, and I wish I could pinpoint the exact moment that I looked at a patient a little differently and was struck by the obvious – nasolabial folds have their origins elsewhere. Scientific and methodic as I considered myself to be, this time I tried something empirically, placing a little bit of Perlane® in the cheek. The immediate lifting effect was obvious and all I needed to modify my injection strategy. Treating the cheeks was now a matter of routine, with temples quickly following similar suit.

The growth of the aesthetic portion of my practice literally exploded with the approval of Restylane® by the FDA in December 2003. Added bonuses were invitations to share my experience with Restylane® with dermatologists and plastic surgeons at national meetings and through other venues for continuing medical education. An opportunity to present to colleagues and experts carries with it the responsibility to learn as much as possible during the preparation.

I may have been sophisticated in designing and executing treatment plans, but I was forced to confront some significant knowledge gaps following the approval of the Juvéderm family of HA fillers in 2006. Eager to try these new fillers with an even higher concentration of HA than the Restylane family, I noticed differences in their flow characteristics and also differences in what each could accomplish. What factors contributed to differences in lifting capacity, smoothness, or degree of swelling? Viscosity, elasticity, and rheology were terms vaguely familiar from college physics but suddenly acquired a new relevance in the process of filler selection, a topic well presented in some noteworthy publications.[4,5] Puzzling as well were differences in duration of the different HA fillers. Was longevity affected by the depth of injection, area injected, or amount of filler used? Experience has shown us that longevity of a given filler is influenced by many factors, but the variability in longevity between individuals still remains a mystery. It is my belief that duration of results can be extended by what is referred to as full correction, whether the treatment is performed all in one session or over several treatment sessions.

By 2004, some of my otherwise happy Restylane patients had begun to express a desire for something longer lasting, which led me to explore other options for volumization. A report of a new soft tissue filler containing calcium hydroxylapatite spheres suspended in an aqueous carrier gel[6] prompted me to try Radiance FN (known today as Radiesse®). The concept of immediate correction followed by subsequent collagen production was appealing, coupled with results showing duration at 12 months. With the economic

downturn of 2008, patients began to focus on getting more "bang for the buck," ie, maximal results with a minimum of product. It was during this time that my use of calcium hydroxylapatite (Radiesse®) increased, with patients reporting a high degree of satisfaction, similar to that noted in the 47-month study by Sadick, Katz, and Roy.[7] Robust and lacking the hydrophilic properties of HA's, Radiesse® is an excellent option for creating a defined jawline and sculpted cheekbones. With the exception of the lip, Radiesse® is a versatile soft tissue filler[8] and can be premixed with lidocaine to minimize injection-related discomfort, without affecting results.[9]

Injection fatigue, a desire for discrete and gradual results, severe lipoatrophy – all scenarios for which I may recommend poly-L-lactic acid (PLLA), Sculptra® Aesthetic. My initial experiences with PLLA (New-Fill, as it was known in Mexico), date back to 2000 and were disappointing. A low-volume reconstitution two to three hours prior to injection was a recipe for clogged needles, nodules, and unimpressive volumization. With HA fillers being so readily available and user-friendly, I quickly abandoned PLLA as a viable option for panfacial volume restoration, despite favorable reports in the literature.[10] I credit friend and colleague Cheryl Burgess for rekindling my interest in PLLA. In my view, peer-to-peer hands-on training is unsurpassed as a pathway to mastering a skill, and I sought every opportunity to train with highly experienced injectors, including Cheryl Burgess, Todd Andrews, Danny Vleggaar, and Rebecca Fitzgerald. I am additionally grateful for giving Sculptra Aesthetic® a second chance because I would have otherwise missed the opportunity to understand the aging face, about which so much has been published in the last several years.[11,12,13,14] Concepts learned in the optimal use of PLLA have become the foundation for the use of all fillers.

Individualizing a treatment often calls for the use of more than one type of filler. For example, I may use Voluma® or Radiesse® in the mid face, Restylane® for the lips and Belotero® Balance to treat etched perioral lines. Aesthetic medicine involves artistry, and artistry often calls for understanding and leveraging the subtle nuances that distinguish one filler from another. Knowledge of underlying scientific principles coupled with a more complete understanding of the complexity of facial aging have taken filler use to another level.

The practice of facial aesthetics is truly a privilege, and we must not overlook our responsibility to stay current. Beyond the scope of this editorial are filler safety and complications, blunt-tipped microcannulas, Ha fillers for skin conditioning, diluting HA's for treatment customization, hyaluronidase, injection techniques such as the tower technique, and new and emerging fillers in the US market. Many of these topics are discussed in Parts I (Vol 11 issue 3) and II (Vol 11 issue 8) of the 2012 JDD issues "The New Face of Fillers: A Multi-Specialty CME Initiative."

A popular saying tells us that "aging is not for sissies," to which I add that neither is the practice of facial aesthetics. Doing our due diligence and sharing the results of our quest in the pursuit of enhancing patient outcomes is integral to achieving success in this exciting and ever changing field. And so the journey continues.

Sincerely,

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Disclosures

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