Hot Topics

Poly-L-Lactic Acid for the Aesthetic Correction of Facial Volume Loss

Sculptra (poly-L-lactic acid), a new injectable soft tissue filler designed to stimulate neocollagenesis, increase dermal thickness, and enhance volume, is most commonly used for the midface and temporal fossa, with more limited use in the mental and prejowl areas. In the authors’ practice, Sculptra injections have virtually replaced autologous fat transfer, yielding excellent results for patients with mild to moderate midface and jowl laxity. (*Aesthetic Surg J* 2005;25:646-648.)

The unending quest for youth and beauty has become more widespread than ever. In the natural course of aging, there are predictable changes in the quality and texture of the skin and in the underlying structure of the face. The natural progression is increasing skin laxity, superficial pigment and textural changes, progressive volume loss in the subcutaneous compartment, and underlying bone resorption. These changes lead to distinct features of aging, including rhytides, deep furrows, malar festoons, jowls, and neck laxity.

In the past, the surgical approach to aging included addressing skin laxity through lifting procedures. With increased understanding of the complexities of facial aging, our techniques broadened to include the supplemental use of soft tissue and bony implants to correct volume loss. With the demand for less invasive techniques, newer methods were devised for volume correction. Autologous fat transfer and liposculpture or lipoinject analysis1,2 provided minimally invasive techniques with minimal tissue reaction and a favorable side effect profile. However, there are limitations to fat transfer, due to the unpredictable nature of engraftment. Despite extensive research into this area, reliable and predictable engraftment has been elusive.

A number of alternative filler substances for volume correction have had limited use. Microdroplet silicone has been used for many years with a relatively safe profile.3 Nevertheless, widespread use and acceptance has been limited, mostly because of the severe delayed granuloma formations seen in the past with the original large-volume silicone preparations.

Recently, a new filler has emerged on the market. Poly-L-lactic acid is the latest injectable substance designed to provide a minimally invasive means to effect large-volume soft-tissue correction. Marketed under the name New-Fill (Dermik Labs, Berwyn, PA) in Europe and Sculptra (Dermik, Aventis, Bridgewater, NJ) in the United States, poly-L-lactic acid is comprised of a suspension of microspheres that are injected into the tissue to stimulate neocollagenesis, increase dermal thickness, and produce subsequent volume enhancement. New-Fill received approval in Europe in 1999, and since then has been used, with an excellent track record, in more than 150,000 patients.4 Food and Drug Administration approval of Sculptra (the US version of New-Fill) for the treatment of volume loss in patients with HIV lipoatrophy was granted in August 2004. Off-label use of New-Fill and Sculptra for volume enhancement quickly spilled over into the cosmetic arena.

**Injection Technique**

Sculptra is made up of a suspension of poly-L-lactic acid microspheres ranging in size from 40 to 63 µm. The particles are usually resuspended in 4 to 5 mL of sterile water plus 1 mL of 1% lidocaine, are vortexed prior to injection. The implant is placed in the deep dermis or upper subcutaneous layer through multiple injection sites. Several different techniques may be used to introduce the implant. Most commonly, a 25-gauge needle is used, and the material is injected percutaneously through multiple puncture sites to create a criss-cross pattern, with small deposits of the suspension injected into the deep dermis to assure even particle distribution. Small tunnels can also be created with a small-gauge needle. However, caution is advised, as the larger the volume of
deposition, the greater the chance of an irregularity occurring at the site.

We commonly introduce a 25-gauge, 1.5-inch needle through the oral commissure and tunnel the needle into the inframalar hollow. By redirecting the needle to various injection points, the entire area can be treated through a single, well-concealed puncture site. When using this technique, it is important to (1) palpate the needle tip to confirm adequate positioning in the deep dermis or upper subcutaneous plane before injecting, and (2) use only small volume deposition at each point to ensure an even treatment. Following placement of the filler, redirect the needle to an adjacent site before performing the next injection. To avoid clogging the needles, we recommend using a vortex mixer to thoroughly resuspend the particles before injecting with a small gauge needle.

Results

The areas most commonly treated with Sculptra are the midface and temporal fossa; there is more limited use

Figure 1. A, C, Pretreatment views of a 64-year-old woman. B, D, Posttreatment views 3 months after a single injection of Sculptra, 3 cc, to the bilateral cheeks.

Figure 2. A, Pretreatment view of a 63-year-old woman. B, Posttreatment view 3 months after 2 injections of Sculptra spaced 6 weeks apart, 2 cc, to each of the marionette lines and prejowl areas.
in the mental region and prejowl areas. Patients receive a series of injections, usually 3 to 5, spaced several weeks apart. Placement of the poly-L-lactic acid stimulates a mild inflammatory reaction, leading to the eventual production of new collagen over the ensuing 4 to 6 months. As the implant slowly resorbs, new collagen is laid down, creating a thicker dermis, histologically, and increased volume, clinically (Figures 1 and 2).

To date, New-Fill and Sculptra have an excellent safety record. The most commonly experienced side effects include local bruising, edema, and temporary erythema. Patients can also experience minute, palpable albeit invisible, noninflammatory nodules at the injection sites. Previous studies have reported the incidence of these palpable nodularities to be anywhere from 6% to 50%. The incidence of these nodules is decreased when using a more dilute suspension of the product. We recommend that one vial of product be resuspended in 4 mL of sterile water with 1 mL of 1% lidocaine and epinephrine. When nodules do occur, they are easily dispersed with firm massage or may be disrupted by introducing a fine gauge needle into the nodule.

The availability, simplicity, and reliability of this product lead to high patient and physician satisfaction. For these reasons, Sculptra has virtually replaced autologous fat transfer in our practice. In our experience, Sculptra injections, used alone, have yielded excellent results for patients with mild to moderate midface and jowl laxity. When used in combination with standard rhytidectomy techniques, pretreatment with a series of Sculptra injections can significantly enhance the eventual outcome by providing a more substantial and sculpted soft tissue foundation over which to redrape the skin during the lift.

In the current climate, in which patients seek less invasive techniques to provide greater aesthetic enhancement, poly-L-lactic acid provides an excellent option for both the patient and physician. The ability to offer patients a procedure with minimal downtime, only mild side effects, and predictable and satisfying results is a great advantage.

References