Long-Term Treatment for Lipoatrophy Associated or Not With HIV Infection Using ePTFE Implants and Polyacrylamide Gel

Bernard Môle, MD
From the Clinical Immunology Department, Professor M. Kazatchkine, Georges Pompidou European Hospital, Paris, France.

Background: HIV-related lipoatrophy (HIVLA) is notable for its increasing incidence, multiple etiologies, relatively low morbidity, apparently irreversible effects, and unequivocal clinical features. The underlying cause of HIVLA is still controversial, but there is an increasing demand for correction.

Objective: We describe a treatment approach using soft malar implants and polyacrylamide gel injections, separately or in combination.

Methods: Expanded polytetrafluoroethylene (GORE-SAM, W.L. Gore & Associates, Flagstaff, AZ) malar implants were used for augmentation of the most sunken areas below the eye. They were placed subperiosteally and more medially than conventional implants. After trying sheets and custom-made implants, preshaped GORE-Tex SAM implants are now used systematically. Polyacrylamide gel (Eutrophill, Lab Procytech, Martillac, France) injections were performed continuously and evenly from one side to the other in the deepest part of the sunken area at the subcutaneous level only.

Results: A total of 85 consecutive patients were treated using implants alone in 8 cases, injections alone in 65 cases, and both implants and injections in 12 cases. The few adverse effects included 3 cases of chronic inflammation (dental conflict) after placement of sheets and custom-made implants; no such cases occurred using preshaped implants. Some very light bulges developed after polyacrylamide injections, which usually disappeared after a few months. Mean follow-up was 16 months for injections and 29 months for implants.

Conclusions: Combination treatment using implants in sunken areas near the bone and fillers in soft tissue areas offers a balanced trade-off between benefits and risks and provides excellent long-term and natural results, as well as notable psychological benefits. (Aesthetic Surg J 2005;25:561-570.)

Although the incidence of iatrogenic diseases has naturally grown along with therapeutic progress, lipodystrophy (LD) is a relatively new and largely unexplored entity. Among the numerous types of adipose tissue distribution abnormalities, human immunodeficiency virus (HIV)–related lipoatrophy (LA) stands out with regard to its recent discovery, increasing incidence, multiple etiologies, relatively low morbidity, apparently irreversible effects, and unequivocal clinical features that further stigmatize an already vulnerable patient group.

The underlying cause of HIV-related LA (HIVLA) is still controversial. The main theories involve competition of antiretroviral agents with proteins regulating lipid metabolism, inhibition of the differentiation program of adipocytes, direct lipolysis, and mitochondrial depletion. Because of the profound psychological impact of facial wasting, there is an increasing demand for augmentation therapy. Patients with facial wasting are immediately recognizable in the general population. Any person with an emaciated face, as a result of either natural morphology or an ongoing LD disorder, is immediately suspected of being HIV-seropositive, with obviously negative consequences on quality of life. Today, however, simple and long-lasting treatment is available for most patients presenting with LA. The purpose of this report is to describe our experience using implants and fillers separately or in combination for treatment of LA. Tolerance to these materials was excellent, with outcome equivalent to or better than in the general population. A possible explanation for this finding is that immunodeficiency constitutes an “advantage” with respect to these materials for patients with HIV infection compared to persons presenting with uncompromised immune systems.

HIV-Related Lipoatrophy

HIV-related lipoatrophy is part of a heterogeneous syndrome called HIV-related lipodystrophy (HIVLD)
that was first described in 1998. In addition to loss of adipose tissue in the face, arms, legs, and buttocks, typical features include accumulation of fat in the form of perivisceral padding in central truncal locations (abdomen and breasts) and lipomatous masses, especially in the dorsocervical region (buffalo hump). According to 2 studies carried out for 18 and 12 months in patients undergoing protease inhibitor treatment, the prevalence of HIVLD ranges from 20% to 30%. Physical changes are accompanied by metabolic changes and by a clear-cut increase in the risk of cardiovascular events in 70% of patients. The risk for development of HIVLA increases with age and length of treatment with the antiretroviral therapies currently implicated (ie, nucleoside reverse transcriptase inhibitors and protease inhibitors). The fact that HIVLA occurs exclusively in patients treated with antiretroviral agents and never in untreated patients appears to rule out the possibility of a direct effect of the virus on adipose cells.

The natural history of HIVLA is unclear. It does not regress after discontinuation of causative treatments, and attempts to correct metabolic abnormalities have not been effective. The prevalence of HIVLA will probably continue to increase; given the current therapeutic regimens effective. The prevalence of HIVLA will probably continue to increase; given the current therapeutic regimens

**Treatment Modalities**

**Expanded polytetrafluoroethylene (GORE-SAM) implants**

Expanded polytetrafluoroethylene (ePTFE) is a carbon- and fluorine-based polymer extruded under pressure to create a woven structure consisting of fibrils of PTFE. Thanks to its mesh-like structure, with a pore size ranging from 10 to 30 μm (mean, 22 μm), the implant is soft and elastic. Implants are available in various forms. The most suitable forms for treatment of facial lipoatrophy are soft (thickness, 1, 2, and 4 mm) and reinforced (thickness 4, 5, and 7 mm) sheets and preshaped malar implants (3 sizes).

ePTFE implants have been shown to have a number of advantages. Tolerance is excellent, thanks to its hydrophobic properties and nondegradability (no macrophage stimulation). In vivo, the implant is covered by a thin layer of fibroblasts. These fibroblasts secrete collagen that can infiltrate to a mean thickness of 200 μm. Another advantage of ePTFE is complete absence of carcinogenic effects. This benefit has been documented by long experience in millions of patients undergoing implantation using ePTFE, which was first marketed for medical application as a vascular prosthesis in 1971. In addition to excellent biocompatibility, ePTFE presents 2 intrinsic advantages: soft flexibility and body-tissue ingrowth. Soft flexibility is a major advantage that makes ePTFE imperceptible to emaciated patients. Tissue ingrowth, although limited, is sufficient to prevent migration after a few weeks.

We were first to propose the use of ePTFE for strictly cosmetic purposes in 1992. We were also the first to publish on the adverse effects of the technique in cosmetic cases. Other investigators have confirmed our data on tolerability, complications, and in particular, infection, which has consistently been less than 4%. Over a period of 8 years, we acquired extensive experience using the ePTFE for facial augmentation, mostly in patients with no other simple alternative. With the availability of a growing range of well-tolerated substitution materials and the development of more reliable lipofilling (LF) techniques, we progressively abandoned ePTFE implants, reserving them primarily for cases in which other techniques raised tolerability or durability issues.

As in our early experience, we first used ePTFE in the form of 2-mm mesh sheets stacked in pyramid fashion and held together by transfixing sutures. To save time and work during the preoperative phase, we later switched to custom-made 4- and 7-mm reinforced SAM implants. However, these implants had disadvantages with regard to symmetry. They were available only in standardized sizes and contours and were excessively rigid, making it difficult to fit them against the bone, especially at the level of the malar convexity. Displacement of the implant can occur during the first days and may go undetected. In 2 cases in our experience, unilateral displacement caused by edema required reintervention. We are now using preshaped GORE-SAM malar implants that have completely eliminated contouring problems and drastically reduced operating time. Preshaped implants come in 3 sizes, with right and left fitting tools. For treatment of facial LA, the 2 largest sizes are generally used for correction of the juxta-osseous zone of the orbital margin at the nostril level. If necessary, additional augmentation is achieved by injection of filling substances.

**Injectable fillers**

The ideal injectable filler product should be not only biocompatible, permanent, adaptable, easy to use, and inexpensive, but should also have a low propensity for migration, residual granuloma, foreign body reaction, and phagocytosis. Recently, numerous synthetic sub-
stances have been developed, and there is now a perplexing range of products available. For the treatment of LA, the 2 main selection criteria are quantity (and, therefore, cost) and durability. Because the amount of material required is much greater for treatment of facial LA than for cosmetic applications (2 to 15 mL per side versus 0.5 to 1 mL), priority must be given to fillers that are compatible, stable, minimally resorbable, and inexpensive. If we exclude human collagen, the range of choice can be extended to more than 20 semipermanent (“delayed-resorption” would be more accurate) fillers. Because of the required quantity and durability, we can eliminate all bovine collagens, hyaluronic acids, and dextran-based fillers. Similarly, because of the thin skin cover involved and the lack of follow-up data on augmentation treatment to 10 years after injection, Breiting et al7 noted no evidence of carcinogenic effect. In a histologic study of specimens up to 9 months was comparable to that of silicone, 350 cs.

In vivo tests using PAAG have revealed no mutagenic or deleterious effects in humans or animals. Exposure to acrylamide monomer can be toxic, but the concentration used for cosmetic purposes is lower than the amounts found in drinking water consumed in a 48-hour period. In vivo tests using PAAG have revealed no mutagenic or carcinogenic effect. In a histologic study of specimens up to 10 years after injection, Breiting et al7 noted no evidence of encapsulation, dystrophy, local allergic reaction, or calcification, and concluded that the long-term stability of PAAG was good. Lemperle,8 who tested an identical molecule (Aquamid, Contura, Sweden) by self-injection with histologic examinations at 1, 3, 6, and 9 months, noted no foreign body reaction. Tissue dispersion at 6 and 9 months was comparable to that of silicone, 350 cs, with a low-grade macro- and fibroblastic peripheral reaction suggesting that slow resorption was possible, depending on the quantity initially injected.

By the time it was introduced into France, PAAG, which was originally produced and used in Ukraine and China as early as 1983, had acquired a bad reputation because of a few cases involving severe complications observed after massive injection into breasts, buttocks, and calves. Although these complications did occur, they were poorly documented and were certainly attributable to the unreasonable amounts used. Any filler product would probably cause similar complications if injected by the liter.

Breiting et al7 in Ukraine conducted an interesting retrospective study devoted exclusively to facial injection using 5% PAAG at conventional dose levels (mean dose, 5.7 mL) in a total of 96 patients (mean age, 37.4 years; mean follow-up, 3.9 years). More than half of the patients (51%) also underwent injection of the same product into the breasts, but no clinical control was performed. The only notable finding was palpable local adenopathy that was not correlated with the amount of PAAG injected in 12% of patients. The author concluded that PAAG was well tolerated and devoid of side effects. Indeed, if there have been any side effects, it is likely that they would have been reported promptly, since thousands of patients have undergone this type of injection, and there are currently 12 PAAG-based fillers available on the French market. Because encapsulation is weak and stability is high, PAAGs have been considered as veritable “endoprostheses.” Removal (at least partial) by needle aspiration has been reported by some investigators,10 but has never been required in our experience.

Our PAAG choice is Eutrophill (Lab Procotech, Martillac, France). It is a 2.5% PAAG obtained by polymerization of acrylamide monomers. The concentration of initiator molecules determines the length and number of polyacrylamide (PA) chains formed during the reaction. In this way, it is possible to control the PA structure precisely and, by the same token, control solubility and resorption rate. Reticulation of PA chains leads to formation of high-molecular-weight polymers that are biologically inert and insoluble but strongly hydrophilic. By inserting biodegradable acrylamide analogues, it is possible to program the in-vivo lifespan of the gel with great precision. The soluble PA chains are more or less slowly released by enzymatic degradation and subsequently cleared via interstitial tissue and biliary pathways without further metabolic changes or degradation. No reaction can release the constituent acrylamide monomers.

In vivo, PAAG works by substitution of the extracellular matrix with a 3-dimensional framework that provides a substitute for migration and adhesion of fibroblasts and macrophages. According to the manufacturer, the soluble molecules generated during the healing process are distributed over the framework, progressively substituting a natural extracellular matrix for the initially implanted matrix. Eutrophill has been tested in compliance with French national testing regulations (cytotoxicity, sensitization, gene toxicity, and chronic toxicity over a period covering at least 10% of the test animal’s life expectan-
Therapeutic Strategy

The work-up is based mainly on the clinical examination, as the physical appearance is highly characteristic, especially in patients with HIVLA, because of the loss of fat layers in the cheeks and temples. Only irradiation-related LA, with or without wasting in the neck and cheeks, is correlated with conspicuous asymmetry and lack of involvement of the temples. Correction of the nasolabial groove is frequently requested. However, while the nasolabial groove may be accentuated by cheek fat loss, such accentuation is not a consequence of wasting or treatment. It is an individual trait that should be treated only after atrophy has been stabilized. During the physical examination, the physician should search for truncal adiposity such as dorsocervical (buffalo hump), submammary, or abdominal fat pads, or generalized lipoatrophy, which has been more frequent in our experience. The condition of the buccal cavity and dentition should be checked, even though most patients undergo close surveillance. Other information that should be obtained includes allergy history, duration of disease, date of onset of wasting, interval between the beginning of treatment and onset, and interval between onset and stabilization (generally only a few months). Only patients presenting an intercurrent HIV-related complication, active disease episode, excessive viral load, or low CD4 level should be temporarily contraindicated for augmentation treatment until their condition normalizes.

The patient should be given complete information on the advantages and disadvantages of the different therapeutic modalities (implants and fillers), with emphasis on adjuvant treatments. There is no mandatory order for treatment, but it seems logical to insert implants before injecting filler products.

If the patient’s first request is correction of truncal adiposity, LF is proposed in association with lipoplasty. The patient should be informed that LF procedures under these conditions often give poor results and that several cycles of treatment may be necessary.

Patients usually choose fillers first for various reasons (fear of surgery, desire for immediate results). We allow an interval of 1 to 4 weeks between 2 treatment cycles, but 2 weeks is theoretically sufficient. We use a maximum dose of 4 mL of PAAG for 2 reasons. The first is to test tolerance, efficacy, and distribution of the product. The second is to ensure that augmentation occurs progressively and is not noticeable to the patient’s family, friends, and acquaintances. The mean number of cycles necessary to achieve basic correction is 1 to 3. Thereafter, it is up to the patient to decide whether to continue or stop treatment. If implant insertion is performed first, we wait for 3 months before beginning filler product injections.

Technique

SAM malar implant

Malar implants used for augmentation of the most sunken areas below the eye were placed more medially than conventional implants. The procedure was performed under general anesthesia with infiltration of 1% lidocaine-epinephrine followed by a 10-minute waiting period to ensure a perfectly bloodless operating field. Insofar as it could be positioned against the bone, the implant was placed well below the orbital margin at the top so that it would not extend below the nasal base at the bottom. The innermost limit was the infraorbital foramen. Placement was subperiosteal to provide protection and fixation of the implant.

The implant pocket was created using the conventional technique—an approach through the superior gingival cul-de-sac, direct subperiosteal undermining of the whole maxillomalar area to the middle third of the zygomatic arch, and insertion of the masseter externally, the orbital margin superiorly, and the suborbital foramen medially. For custom-made SAM implants, we also undermined inside the foramen to allow placement of an extra ring of SAM, but this addition is not absolutely necessary. After rinsing the pocket with hydrogen peroxide, the sizing tool was introduced to check the quality of undermining and allow selection of the proper size implant (large or small). In this regard it should be said that, for natural results, the larger size implant should not be used systematically without taking into account the patient’s morphology. The permanent implant was soaked for a few seconds in polyvidone iodine and then inserted into the pocket as quickly as possible to limit contact with buccal mucosa.

If necessary, insertion was facilitated by traction on a suture thread attached to the tip of the implant, using an
orbital cerclage suture grasper passed percutaneously from the zygomatic arch (Figure 1). This technique not only allowed rapid placement of the implant without damaging the ePTFE, which is sensitive to compression and stretching, but also avoided any risk of distorting the soft tip, which is the most distal and difficult part to handle. Proper placement was checked manually and visually. The long axis of the implant should be slightly oblique from the bottom inward, and the superior internal notch should be flush with the infraorbital foramen. As stated above, it is important that the implant be placed more medially than a conventional malar implant (Figure 2). A safe distance was left between the lower end of the implant and entry site.

After washing again with hydrogen peroxide and polyvidone iodine, the incision was closed using 2 layers of Vicryl rapid 5.0 (Ethicon, France). The procedure required about 30 minutes for bilateral placement. We applied 2 layers of Micropore tape (3M Santé, Cergy-Pontoise, France) over the whole undermined area for 5 days to lower the incidence of postoperative edema. Sequelae of the procedure disappeared within 1 week. During this period the patient was instructed to eat a liquid diet, avoid sleeping on the stomach, cleanse the mouth with hydrogen peroxide after every meal, and take cephalosporin at a dose of 2 to 3 g per day, depending on body weight.

Eutrophill PAAG injection

With the patient in a seated position, the sunken areas were carefully drawn on the face using level lines. Injection had to be performed under local anesthesia because injection of high-pH PAAG is extremely painful. Even though PAAG can be injected through smaller needles, use of a 21- or 23-G needle is recommended to obtain more even distribution, while avoiding excessive pressure on the plunger. Injection was performed continuously and evenly from one side to the other in the deepest part of the sunken area at the subcutaneous (never subdermic) level. At each cycle, a dose of 1 to 3 mL was be injected on each side. A third of the syringe was reserved for final touches after completing bilateral injection. In the highly convex external malar area, it was sometimes difficult to avoid some beading in patients with extensive wasting. Massaging often failed to smooth out these irregularities, which may persist for a few months and be visible when light strikes the face at an oblique angle. Patients were examined at 1-month postinjection for further treatment if necessary, including bulking, correction of asymmetry, and/or treatment of another zone.

Augmentation in temple areas

Augmentation in temple areas was often requested by patients with HIVLA but should not be given first priority. After correction of midface LA, the temple areas can be treated using the following methods.

For augmentation in the temple areas using SAM implants, it was preferable to use 2 layers of 2-mm mesh rather than a single layer of 4-mm mesh to achieve the best possible adaptation. The main difficulty was avoidance of an overly visible step over the ascending ramus. Positioning against the ramus could be difficult without hemicoronal exposure, which we considered to be excessive. The vertical temporal intrascalp approach was used, with undermining of the temporal fossa to the zygoma and the ascending ramus at the avascular level of the deep temporal aponeurosis. An implant with a thicker lower
Results

A total of 85 consecutive patients were treated using implants alone in 8 cases (Figure 3), injections alone in 54 cases (Figure 4), and both implants and injections in 12 cases (Figures 5 to 8). SAM implants were placed in 20 patients, including 18 (90%) who presented with HIVLA. All patients were male. Their mean age was 50 years (range, 32 to 74 years).

The type of implant used changed over the years. In 3 cases (15%) performed during our early experience, the implant was made using layered sheets. In 6 cases (30%) in the middle part of our experience, SAM block implants were used. In 11 cases (55%), large or middle-sized preshaped malar implants were used. It should be noted that in 2 cases, SAM block implants were replaced with preshaped implants, bringing the total number of preshaped implants used to 13.

Mean follow-up was 29 months (range, 2 to 68 months). Complications were observed in 6 cases, including dental manifestations in 1 case caused by malposition of a block implant that was later replaced by a preshaped implant; subchronic inflammation in 2 cases, treated by block implant replacement in one case and ablation in the other; regressive unilateral dental hypoesthesia in 2 cases, and poor cosmetic outcome in 1 case involving a patient with extensive atrophy who was treated by replacement of the block implants with preshaped implants (Figure 9). Twelve of these patients (60%) opted for adjuvant augmentation treatment using various filler materials: PAAG in 8 cases, NewFill in 2, and FT in 2. One patient underwent SAM implant placement after PAAG injection. It is noteworthy that no complications have occurred since preshaped GORE-SAM implants have been used routinely (follow-up, 15 months).

Injections using Eutrophill were performed in 65 patients with a mean age of 53 years (range, 33 to 67 years), including 58 men (89%) and 7 women (Table). Sixty of these patients (92%) presented with HIVLA. In the remaining 5 patients, LA was linked to various forms of cancer, such as ocular melanoma, tonsil cancer, and digestive tract cancer. Mean follow-up was 16 months (range, 2 to 54 months). All the illustrated results must be considered provisional, as injections are given in cycles and most patients are still undergoing treatment.

In addition to implant placement, treatment was associated with LF in 3 cases and injection of other filler products in 6 cases (NewFill [Aventis, Strasbourg, France] in 3 cases, and BioAlcamid [Polymekon, Milan, Italy, or Aquamid Contura International, Soeborg, Denmark] in 3 cases). To our knowledge, there was no blending of Eutrophill with the other filler products.

The only side effect or complication observed thus far in our experience was some roughness visible under oblique-angle lighting conditions in patients with thin skin (3 patients). This problem has been observed less often since we began using the “block” injection technique instead of the conventional retro diffusion method.

Discussion

Use of ePTFE implants should raise little controversy, as this material has documented excellent tolerability, inalterability, and resistance to infection in over 35 years of use. Implantation provides immediate volume augmentation of at least 15 to 20 mL without any drawbacks except some bumping noted in very few patients. After proper placement, the implant cannot migrate and mimics the natural feel of tissue in the area. Postoperatively, the entry site is invisible, and recovery requires only that the patient use mouthwash. Because no specialized nursing care is necessary, the risk of contamination of health care personnel or other persons is low. Probably the greatest advantage of ePTFE implants in comparison with other techniques is complete reversibility without sequelae. This is especially important because reversibility of HIVLA cannot currently be ruled out. In contradiction to anecdotal reports during discussions at various meetings, our long experience demonstrates that removal of ePTFE implants can be readily performed without any particular problem, even after the device has been in place for several years. When compared to ePTFE implants, other devices available on the market present notable drawbacks, including excessive hardness, risk of bone resorption and migration (silicone), and need for attachment to bone (Medpore, Porex Corp, Newman, GA).

A final point concerning implants is the persistent reticence on the part of some plastic surgeons with respect to the use of synthetic materials for facial implantation. As students of Paul Tessier, we were taught to always
Long-Term Treatment for Lipoatrophy Associated or Not With HIV Infection Using ePTFE Implants and Polyacrylamide Gel

Figure 3. A, Preoperative view of a 45-year-old patient with HIVLA. B, Postoperative view 11 months after placement of a GORE-SAM malar implant alone.

Figure 4. A, Pretreatment view of a 56-year-old patient with HIVLA. B, Posttreatment view 19 months after several cycles of Eutrophill injection alone (total, 6.5 mL per side).

Figure 5. A, Preoperative view of a 52-year-old patient with HIVLA. B, Postoperative view 5 years after combination treatment using layered sheets of GORE-SAM fabric and PAAG injection (10 mL per side).
Figure 6. A, Preoperative view of a 31-year-old patient with LA unrelated to HIV infection. B, Postoperative view 20 months after combination treatment using placement of preshaped GORE-SAM cheek implants and PAAG injection (4 mL per side).

Figure 7. A, Preoperative view of a 49-year-old patient with LA unrelated to HIV infection. B, Postoperative view 12 months after combination treatment using placement of preshaped GORE-SAM malar implants and PAAG injection (right, 25.5 mL; left, 8.5 mL).

Figure 8. A, Preoperative view of a 48-year-old patient with HIVLA. B, Postoperative view 11 months after combination treatment using placement of preshaped GORE-SAM cheek implants and PAAG injection (7 mL).
Long-Term Treatment for Lipoatrophy Associated or Not With HIV Infection Using ePTFE Implants and Polyacrylamide Gel

Scientific Forum

In cases of LA in which bone is not implicated, we see no comparison between morbidity associated with harvesting a graft from the skull—especially in a patient with HIV—and the potential risks of using synthetic material, without mentioning the possibility of graft resorption. Moreover, we cannot understand why some of our fellow surgeons should be reluctant to use facial implants that are only a few cubic centimeters in volume when few have any objection to the use of breast implants measuring several hundred cubic centimeters. Insofar as the principle is concerned, we see no difference. We strongly recommend the use of preshaped implants, which completely eliminate potential irregularities and asymmetries if placed in the correct position.

Use of filler materials raises more questions since adverse effects, albeit rare, have been reported with all products on the market. Because LA is a direct result of fat loss, LF would be the logical first-line solution. However, in our experience, the outcome of LF was poor regardless of the technique used. There are 2 main reasons for this. First, fat reserves in patients with generalized LD are so depleted that harvesting is a tedious and unrewarding process, yielding fragile bloody specimens. Second, even in patients with typical LD with facial LA and central truncal lipohypertrophy, the lifespan of harvested fat is short. The reasons for quick elimination are unclear but could involve the combination of a poor intrinsic factor, such as abnormal adipocyte metabolism, with local problems, such as poor vascularization and protection at the treatment site.

If late adverse events are possible, how can we rule out the potential risk of severe longer-term complications? This possibility haunts us at all times, regardless of which filler is used. This is true for a wide range of diseases besides LA, including all fluid augmentation treatments performed for cosmetic purposes. Severity of potential complications is not correlated with the volume of material injected, and PAAG cannot be exempted of this risk in comparison with other products. Suspicion is often still based simply on a few cases of unusual and serious, but poorly documented, complications. Nevertheless, PAAG presents several advantages. From a physicochemical standpoint it offers surprising adaptability, not only in terms of fluidity but also of resorption, which can theoretically be programmed during production. The possibility of direct removal by needle aspiration would represent another advantage in comparison with other fillers, but this feature will require further study. The growing success of PAAG will certainly spawn numerous studies, and a high level of vigilance must be maintained, as rapid assessment of resulting data will offer the best protection for patients.

We have used polylactic acid (Newfill, Sculptra) extensively for 3 years on the basis of availability in quantity (and thus at lower cost), easy storage, and durability.
Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Aesthetic Surgery Journal ~ November/December 2005

Table. Treatment data for patients receiving Eutrophill PAAG injections

<table>
<thead>
<tr>
<th>Treatment data for patients receiving Eutrophill PAAG injections*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of injection sessions</td>
</tr>
<tr>
<td>Average total volume (mL) injected into cheeks</td>
</tr>
<tr>
<td>Average total volume (mL) injected into temples</td>
</tr>
<tr>
<td>Average follow-up (mo)</td>
</tr>
<tr>
<td>No. of patients complaining of visible bumpiness after 1 month</td>
</tr>
</tbody>
</table>

*In 12 patients (17%), injection was associated with placement of SAM implant.

No single technique is completely effective. In combination, the 2 techniques proposed in this report—implants in sunken areas near the bone and fillers in soft tissue areas—offer a balanced trade-off between benefits and risks. A surprising finding in our experience is that many patients did not undergo both treatments. This suggests that each treatment gives good results, and that patients can be satisfied even if the outcome is not perfect or complete.

Conclusion

Unless some unexpected change in immunity status or therapeutic breakthrough occurs, the incidence of HIVLA will continue to increase, whereas the incidence of LA due to other causes will remain stable. There is a growing demand for effective, long-lasting augmentation treatment, and an alternative is needed for treatment of patients with wasting throughout the body, as is most frequently the case. Use of ePTFE implants allows immediate, durable, reversible augmentation if necessary. Implants can be completed or replaced by injection of soluble filler products, albeit with less certainty. In choosing between current filler products, increasing preference should be given to PAAGs, based on their bulking efficacy, documented low side effects, and potential slow resorption. Regardless of the method(s) chosen, in our opinion reversibility is a key feature, since research on normal and pathologic fat tissue behavior is currently in its infancy.

The author is not bound by any agreement with Gore or Procytech. Procytech donated the injectable gel (Eutrophill) used in the framework of this study carried out in the Clinical Immunology Department at the G. Pompidou European Hospital.

Reprint requests: Bernard Môle, MD, 15 Avenue de Tourville, 75007 Paris, France.

Copyright © 2005 by The American Society for Aesthetic Plastic Surgery, Inc.

References

14. Valantin MA. Polylactic acid implants (Newfill) to correct facial lipoatrophy in HIV infected patients: result of the open-label study VEGA. AIDS 2003;17:2471-2477.