Idiopathic Hemifacial Atrophy Treated with Permanent Polyacrylamide Subdermal Filler

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Idiopathic hemifacial atrophy—also termed Parry–Romberg syndrome—is a rare, disfiguring, neurocutaneous disorder that typically presents in children and young adults.[1] It is characterized by progressive facial hemiatrophy and may involve the subcutaneous fat, muscle, or even craniofacial bones. In many cases, the disease can be self-limiting. Atrophy may in some cases follow an inflammatory morphea-like phase.[2] Treatments to correct the deformity involve surgical flaps (muscle, bone, or both) and autologous fat transfer.[3–5] The latter has been associated with variable results, the longevity of the graft sometimes being limited.[6]

A 38-year-old woman presented to the maxillofacial surgery department with a 3-year history of progressive left-sided facial atrophy involving the cheek and mandibular border and the angle of the mouth up to and including a portion of the upper lip (Figure 1). There was no history of any trauma preceding the onset of tissue atrophy. The atrophy was restricted to subcutaneous fat, with no bony involvement clinically or on imaging (panoramic radiograph). The disease process was evidently no longer active, having not progressed for longer than a year. Nevertheless, the disfigurement was distressing such that she was accustomed to wearing her hair long on the affected side to cover her face. The patient's principal concern was the asymmetry of the chin, which she was unable to conceal with her hair. Surgical options considered included a subcutaneous platysma flap and a genioplasty to correct the chin. She was referred to the dermatology department for an opinion on the possibility of any active inflammatory or autoimmune process. On examination, no cutaneous abnormalities were demonstrable other than the features in Figure 1. There were no features of active or inactive morphea and in particular no linear (coup de sabre) features. Cranial nerve examination was normal. Serologic investigations including antinuclear antibodies, rheumatoid factor, and anticardiolipins were within normal limits. Renal function, C-reactive protein, and liver function tests were normal. The atrophy was no longer progressive and had not been for at least 18 months according to the patient's history and photographs. In view of the limited extent and the lack of involvement of deeper structures, a conservative approach with subdermal implants was considered rather than surgery. Permanent polyacrylamide hydrogel filler (PAAG) was selected because of experience of its use in HIV-associated facial lipoatrophy.[7] Autologous fat transfer was not used because of a lack of guarantee of its longevity in this condition and slightly greater risk of side effects at the harvesting and graft sites.

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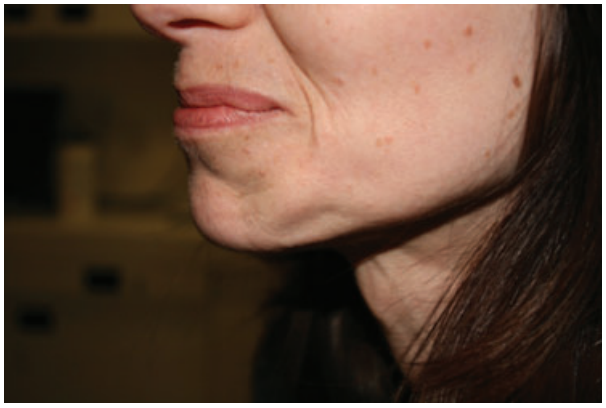

Figure 1. At presentation, showing complete loss of subcutaneous fat extending from the point of the chin halfway along the mandible (visible immediately beneath the skin), up to and around the angle of the mouth and onto the cheek.

The polyacrylamide injections were supplied free of charge on compassionate grounds by the manufacturers (Aquamid Reconstruction, Contura A/S, Soeborg, Denmark). This allowed the patient to receive 7 mL of filler over five visits with excellent cosmetic results (Figure 2). There was insufficient material to treat the remaining area of tissue loss posteriorly on the cheek, but the patient was pleased with the result and did not seek to have any more treatment at that stage. Eighteen months later, the improvement was maintained, with no loss of bulk and no new areas of atrophy apparent (Figure 3).

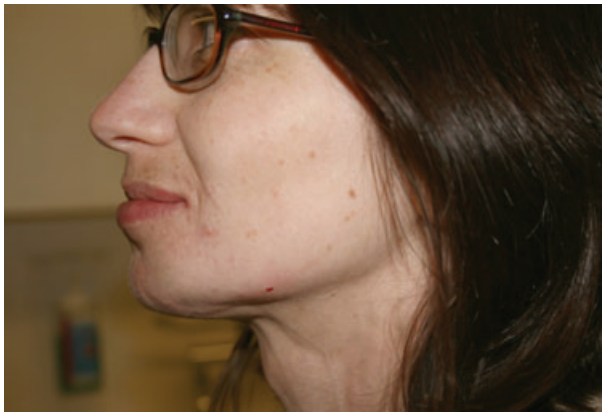

Figure 2. After the final injection, showing recontouring of the face.

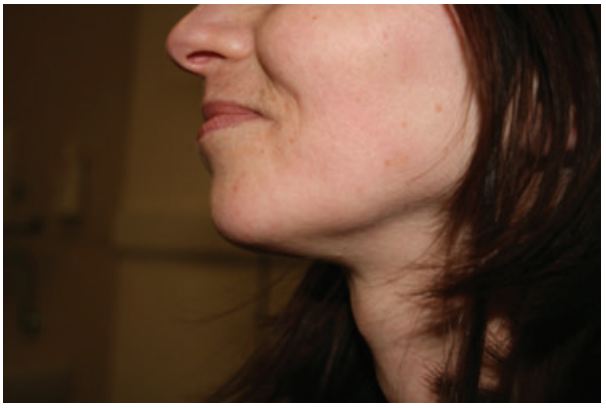

Figure 3. Eighteen months after the final treatment, the result is excellent and maintained.

A number of therapeutic interventions have been described for the correction of hemifacial atrophy,[8] including autologous fat transfer (AFT), surgery, and a range of temporary fillers or permanent implants. Surgery was considered in our case and may have resulted in the need for fewer visits, but because the patient had a small, localized facial deformity, we elected to adopt the more-conservative treatment using subcutaneous PAAG injections. These allowed for a gradual approach to the reconstruction and were felt to carry a smaller risk of complications. AFT is described in the management of Parry–Romberg syndrome[8] but has variable results, in part due to the skill of the operator in handling the adipose tissue[9] and possibly because any underlying disease process may subsequently involve the graft. Although it is minimally invasive, AFT carries a greater risk of complications than PAAG[10] because it also involves a donor site from where the fat is harvested. The longevity of a fat graft has been studied in individuals receiving the treatment for facial aesthetics, and on average 32% of the volume remains at 16 months,[6] although higher figures have been reported in a group of patients receiving treatment for a variety of conditions including lipoatrophy.[11]

PAAG is a nonabsorbable hydrogel filler that is placed subcutaneously. It is approved for facial contouring including aesthetic indications and the correction of deformities resulting from disease or

injury. PAAG has found particular use in the management of antiretroviral-related facial lipoatrophy[12] and has become the treatment of choice in some centers. It is a volumetric gel like hyaluronic acid or collagen products, so the effect is immediate, but unlike these other agents, it is not degraded, and the effect is therefore long lasting. Many synthetic fillers, particularly those containing microparticles, rely on a host tissue reaction for their effect and as such can be associated with inflammatory reactions including granuloma formation. PAAG is only rarely associated with such reactions,[13] infection being the only serious adverse event likely to occur.[14] Strict aseptic technique is therefore essential when administering the material, but infection remains a risk because of the volume of static water held in the gel. In the case described herein, the product used was 97.5% water and 2.5% cross-linked polyacrylamide polymer. Over several weeks, the gel becomes infiltrated by macrophages and other cells, resulting in the formation of an internal scaffold of thin, vessel-bearing connective tissue strands. When this network has developed, the risk of infection diminishes because the gel is accessible to immune surveillance.[13] The acute appearance of an infection involving the hydrogel can resemble an inflammatory tissue reaction, which can lead a clinician unfamiliar with the product to treat initially with corticosteroids. If this is done, the infection can become severe. For this reason, all patients are warned about these risks and asked to carry an information card, with some centers also administering prophylactic antibiotics at the time of injection.

AFT would seem intuitively to be the better option for facial contouring in hemifacial atrophy, but this case demonstrates that PAAG is a simpler, safe, and reliably controllable option for the long-term correction of small facial deformities. Although there is well over 10 years of experience with this type of material, further observation and follow-up are needed to confirm sustained safety and efficacy.

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