Autologous fat transfer in the successful treatment of upper limb linear morphoea

Sirs,

Linear morphoea is a variant of localised scleroderma that clinically appears with lines of cutaneous sclerosis, with possible involvement of underlying muscles and/or bones. They can be severely disfiguring when they interest the face, or become debilitating when, for instance, limbs are involved. Currently, several therapeutic options are available; among the surgical treatments, there are non-autologous procedures and autologous procedures. The former essentially include the use of injectable fillers, which, however, are accompanied by the risk of foreign body reaction; moreover, it is not easy at all to restore a natural contour and texture in the treated areas. Autologous procedures include the use of free flaps, dermis and fat transplants. The latter, especially, is proving successful considering its characteristics: no risk of rejection, the ready availability of material for repeated injections, minimal donor site morbidity. The grafted adipose tissue does not only have a mere filling effect on the receiving site, but rather it promotes the dynamic tissue regeneration (1). Its use for cutaneous regeneration in radiation therapy outcomes and wound healing is well known (2, 3). The trophic properties of adipose tissue are related to its Stromal Vascular Fraction (SVF) (4), which is made of various cellular subpopulations with as many different properties (5, 6). As it is hypothesised that adipocytes and SVF may create an optimal environment that protect the perivascular niche and support the regenerative effect of cells and growth factors within host tissues, it becomes crucial to identify adipose tissue harvesting systems that implicate the least possible mechanical damage to the adult and mesenchymal adipose cells. The aim is to obtain concentrates rich in vital cells and growth factors. Compared to traditional techniques, the Water-Jet assisted liposuction allows a milder harvesting of the adipose tissue, through an adjustable water jet that is able to cause the hydrolipolysis of the treated area, without cell damage (7, 8). The promising results achieved elsewhere by employing fat transplant in the treatment of sclerodermic lesions on the cervicofacial district, induced us to adopt this therapeutic strategy with a 40-year-old woman suffering from linear morphoea on the upper left limb. She presented a depressed scleroatrophic line involving the palm of the hand, the posterior surface of the forearm and the arm and the scapular area. She reported also dull aching pain and burning sensation in affected sites, with an increased tissue tightness and a significant stiffness of the upper limb. Moreover, thermographic imaging confirmed hyperthermia in the involved areas. Initial treatment was medical with methotrexate (20 mg/week) and methylprednisolone (with gradual reduction in dosage). After 4 years, the patient was referred to the Service of Plastic Surgery (March 2016), where she was proposed a correction of the scleroatrophic lesions with repeated sessions of lipofilling. She underwent 3 sessions of lipostructure at 6 months intervals. All sessions were performed under general anaesthesia, using Water-Assisted Liposuction (BodyJet™, Human med AG-Germany). The donor areas were infiltrated with tumescent solution (adrenaline 1mg in 1000mL of saline solution). The final volume of pure fat aspirated was, respectively, 120ml, 120ml and 150ml. The fat graft was then injected into sclerodermic lines. There were no perioperative complications. As immediate effect of the procedure, the patient reported a marked improvement of the local clinical status, in terms of attenuation of pain. In the following weeks, a progressive improvement of tissue consistency was reported, in terms of "softening" of the skin and betterment of flexibility. As further proof of the lipotransfer beneficial effects, thermographic imaging documented a reduction in skin temperature in the treated areas. This is consistent with reduced inflammation or hyperaemia accompanying clinical improvement in the localised skin sclerosis (Fig. 1).

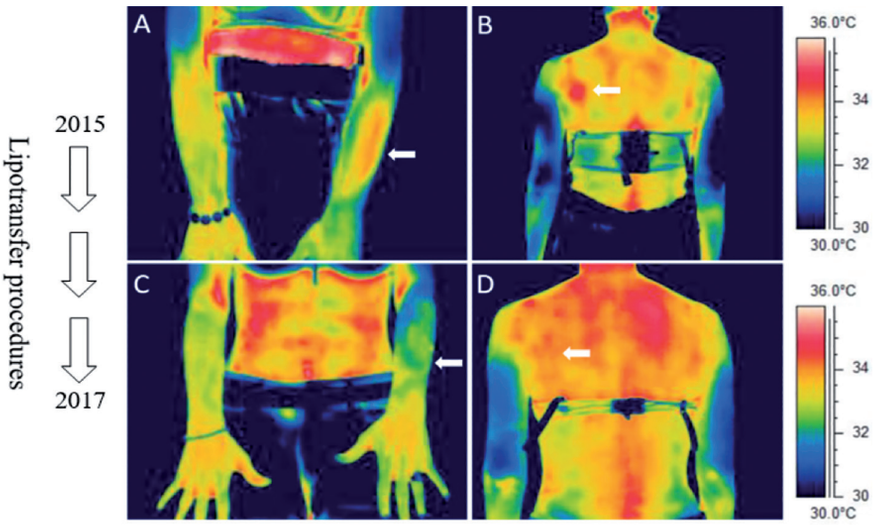

Fig. 1. Reduced thermographic activity in linear morphoea following successful lipotransfer.
Initial thermographic imaging confirms elevated skin temperature (arrows) at sites of linear morphoea on left forearm (**A**) and left shoulder (**B**). After 3 successful treatments with lipotransfer there is clear improvement with reduced skin temperature at each site (arrows) reflecting clinical benefit (**C**, **D**).

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