

Is Fat Grafting a Viable Treatment Option for Chronic Neuropathic Pain?

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In the current opioid epidemic, chronic pain management is a challenge. Physicians must balance pain control, patient satisfaction, medication side effects, and fear of creating or feeding addiction. Neuropathic pain manifesting as complex regional pain syndrome is difficult to manage because of its intermittent and severe nature as well as its often refractory response to typical medication.

Given the lack of effectiveness in sustained pain relief with current medications, some investigators are shedding light on the expansive use of adipocyte-derived stem cells as possible treatment options. Clinically, lipoaspirate has been described for its use in treatment for breasts affected by radiotherapy and in post-mastectomy pain syndrome. Several studies have also focused on the ability of fat to abate the inflammatory response, induce scar tissue architectural remodeling, regeneration, and play a role in opioid receptor interactions.^{1–3} Therefore, we posit that fat grafting could become a viable alternative for the management of refractory regional pain syndromes.

At the University of Pittsburgh, a 34-year-old female was referred to the Department of Plastic Surgery for management of chronic cranial neuralgia and headaches. Prior history includes epilepsy treated with a craniotomy in 2013 and hardware removal in 2015. Since removal of hardware, she reported daily intermittent, severe, shooting, and stabbing facial pain. Pain was associated with temporal edema, triggered by either extreme cold or barometric pressure changes, and predominantly located around her left eye and fronto-temporal region. She also had occipital pain and tension-like headache. She took sumatriptan 100 mg ×5–6/month, naproxen 500 mg ×10/month with minimal relief, and isolated herself from social situations due to environmental triggers. After 1 treatment with 25 ml of autologous fat transfer to the left scalp and central scalp concavities, she noticed significant decrease in pain. Her symptoms improved and she decreased the amount of sumatriptan use by half. At 6 months, she had sustained relief in areas where she was initially grafted. She returned to clinic requesting further treatment in regions not yet grafted. Guided by Tinel's sign, areas of nerve irritation were identified over her occipital region. After a second session with 6.5 ml, she returned to clinic with significant

improvement of pain. She is overall happy with results and contour. She desires to have additional fat grafting for further pain relief in aggravating locations over her craniotomy sites.

It has been shown that fat injections can improve pain control in patients with Arnold Neuralgia and post-mastectomy pain syndrome, and there is growing evidence that adipocytes play a role in tissue remodeling and inflammation.^{4,5} This led us to further explore the untapped potential of fat grafting for the treatment of pain syndromes. While there are several preliminary reports as well as a proposed mechanism for this benefit through adipocyte-derived stem cell's regenerative and anti-inflammatory properties, large randomized controlled clinical trials are needed before widespread treatment of this problem can begin. Based upon our experience and the mounting literature, we view autologous fat transfer as a safe and innovative solution for neuropathic pain syndromes and a promising treatment option for other chronic pain syndromes.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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