CASE REPORT

Successful treatment of lipoatrophy with normal saline

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Key words: corticosteroids; lipoatrophy; radiculopathy; saline injections.

INTRODUCTION

We present a case of lipoatrophy treated successfully with intralesional normal saline injections. Localized lipodystrophy, or lipoatrophy, presents as focal loss of subcutaneous fat with variable overlying skin changes and depth depending on the cause. Lipoatrophy could result from both oral and local intralesional corticosteroid use, with the buttocks and proximal extremities being the most commonly affected sites with oral use.[1] Minimal literature exists about corticosteroid-induced lipoatrophy. Localized reactions to injected corticosteroids are thought to occur in less than 0.5% of cases, which primarily include hemorrhage, atrophy, secondary infection, changes in pigment, hypersensitivity reactions, and panniculitis.[2] The observed lipoatrophy typically begins 2 to 3 months after injection and can resolve spontaneously.[3] Here we report a case of acquired localized lipodystrophy, which results mostly in cosmetic concerns but has limited treatment options to offer patients.[4] We describe the technique for intralesional saline injections to assist clinicians in use of this treatment. Success of this technique has been previously described, and our case report confirms this previous report[3] but uses different time intervals between injections.

PATIENT PRESENTATION

A 51-year-old woman presented to our dermatology clinic with a 1-year history of 3 depressed, atrophic white plaques on the left scapula, sacrum, and right ankle. Her medical history was significant for bilateral L5 radiculopathy causing bilateral numbness of the feet and fibromyalgia. She initially underwent dermatology evaluation in Taiwan for these skin lesions. An excisional biopsy, performed in Taiwan, of a lesion on the left scapula found shrinkage of the adipocyte, mild myxoid change, and increased vascularity consistent with lipoatrophy. She began treatment with intralesional normal saline, but treatments ceased once she moved to the United States. Nine months after her initial presentation in Taiwan, the patient presented to our dermatology clinic with persistent atrophic, white plaques at the left scapula (Fig 1, *A*), right sacrum (not pictured), and right ankle (Fig 1, *B*). The lesions had faint overlying telangiectasias. It was unclear what caused the lipoatrophy. Based on the patient's medical history and presentation, we suspected steroid use in the area. Although the patient did not recall receiving steroid injections in those areas to treat her pain, her examination was suspicious for localized corticosteroid-induced atrophy. A repeat biopsy was declined by the patient. We resumed intralesional normal saline injections every 4 weeks, given that the patient noted that this treatment had been improving the atrophic areas. Over 9 months, the patient was given a range of 3 to 12 mL of intralesional bacteriostatic 0.9% saline to the depressed areas. The injections were performed using a 30-gauge needle at a 45° angle into the dermis of the atrophic plaque and infiltrating several milliliters until the skin was taut and no longer depressed. Usually, only one needle entrance to the center of the lesion was necessary, which reduced patient discomfort. The amount injected varied based on the site and the amount of atrophy in a particular location. As a result of the treatments, the depression and coloration of the lesions were much

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Funding sources: None
Conflicts of interest: None declared.
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JAAD Case Reports 2015;1:415-7.
2352-5126

http://dx.doi.org/10.1016/j.jdcr.2015.10.008

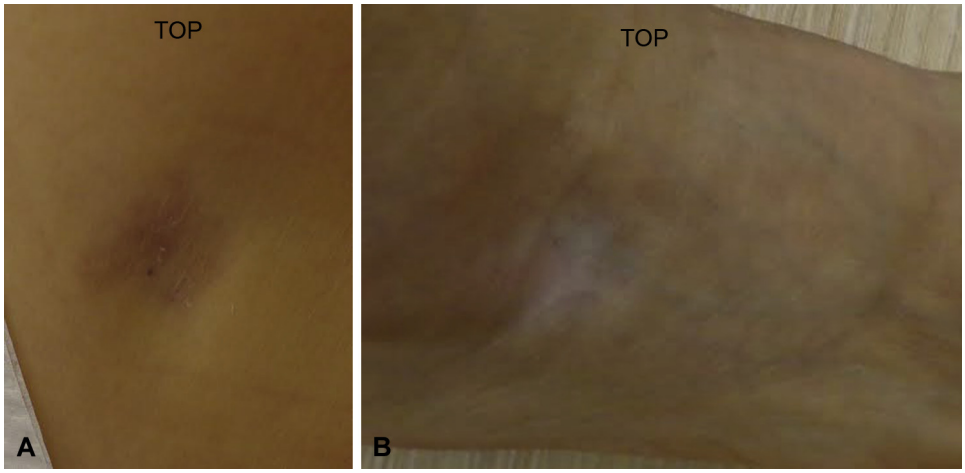

Fig 1. A, An atrophic plaque on patient's left scapula after two 0.9% intralesional saline injections (no significant change in appearance from baseline). **B**, An atrophic plaque on patient's right ankle before treatment.

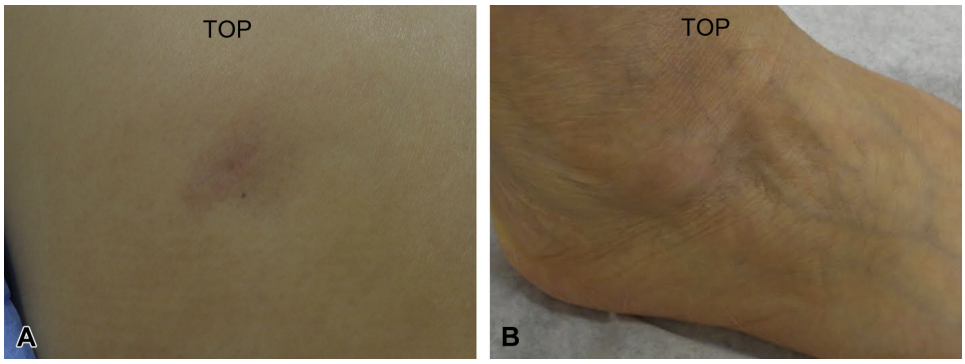

Fig 2. After saline treatment. Resolution of the plaques on (**A**) patient's left scapula and (**B**) right ankle after 5 monthly and 2 monthly 0.9% intralesional saline injections, respectively. The areas are no longer atrophic or as noticeably discolored.

improved. The left scapula showed improvement within 5 months (Fig 2, *A*). The right ankle improved after 2 injections (Fig 2, *B*). The right ankle lesion resolved completely by her last follow-up visit and did not require as many treatments as the more atrophic areas on the back.

DISCUSSION

Corticosteroids (glucocorticoids) are commonly used intralesionally for hypertrophic scars, alopecia, and other skin conditions. Glucocorticoids suppress leukocytes from adhering to endothelial cells, which limits the ability of leukocytes to enter the nearby tissues and decreases inflammation.[5] In addition, corticosteroids are potent vasoconstrictors, reducing both oxygen delivery to the wound and re-epithelialization. Collagen synthesis is also slowed by the steroid's antimitotic effects.[6] Decreasing inflammatory molecules with intralesional corticosteroid injections can improve scar pliability, shrink scar size, and reduce pain.[6] Although steroids such as triamcinolone are efficacious in this scenario, side effects can include subcutaneous tissue atrophy, capillary dilation, and hypopigmentation.[7] Many articles cite known side effects of the drug. However, it is difficult to find how many patients experience corticosteroid-induced lipoatrophy. One study found that lipoatrophy was preceded by an injection in 62% of patients.[1]

Histologically, it has been found that after corticosteroid injections, adipocytes decrease in size and number and are surrounded by hyaline.[1,8,9] The fat cells were noted to resemble embryonic fat cells because of prominence of vessels, termed *involutional fat*.[8] Macrophages, some with yellow-gray and mucin-positive granules have been found in the area of interest as well.[1,2,9] In some instances, macrophages were shown to engulf adipose tissue, thereby becoming lipophages.[1,10] As the microscopic findings of the substance engulfed by macrophages disappeared, the lipoatrophy faded as well.[2]

Serial saline injections on a weekly basis are found to completely resolve the cosmetic effect of lipoatrophy within 4 to 8 weeks of the initial saline injection.[3] In one case report, autologous fat injection was used to treat atrophy with results noted 6 months after treatment began.[11] Intralesional poly-L-lactic acid acts to induce fibroblast and collagen formation, has been used for treatment of human immunodeficiency virus–associated facial lipoatrophy, and was recently reported in a case of corticosteroid-induced lipoatrophy.[12] Maximal improvement of the lipoatrophy was noted in 3 to 5 months.[12]

Our patient was followed over a 9-month period. The alternative treatments mentioned above are expensive and inconvenient, potentially prohibiting patients from following through with experimental treatment. On the other hand, monthly intralesional bacteriostatic saline can be a convenient and affordable treatment for lipoatrophy attributed to intralesional or intra-articular steroids. Our patient had improvement in the appearance of her skin lesions while undergoing monthly injections and had no significant side effects. There may have been faster improvement if she had undergone weekly injections as described previously.[3] However, further studies may help determine if a synergistic effect between time and saline injection is possible, further delineating the need for injections on a monthly versus weekly basis. It is hypothesized that injecting saline where steroid crystals lie would put them back into suspension, where the crystals could then be recognized as foreign bodies and naturally removed from the body.[13] Further studies may help elucidate the mechanism of action and are needed to better characterize optimal treatment dose and frequency.

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