

Normal saline injection; a promising method to treat steroid-induced atrophy

Maryam Sadat Sadati, MD ^{1,2}
 Nahid Hemmatian Boroujeni, MD ^{1,2}
 Mozhdeh Sepaskhah, MD ^{1,2}

1. *Molecular Dermatology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran*
2. *Dermatology Department, Shiraz University of Medical Sciences, Shiraz, Iran*

Corresponding author:

*Nahid Hemmatian Boroujeni, MD
 Molecular Dermatology Research Center, Dermatology Department, Faghihi Hospital, Shiraz, Iran
 Email: n_hemmatian_b@yahoo.com*

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Subcutaneous fat atrophy at the site of multiple injections can follow intradermal or intramuscular administration of steroids to treat inflammatory diseases. This condition takes several months to develop, and usually patients seek medical attention due to cosmetic deformities. Several methods, including fat transfer, filler injection and normal saline injection have been proposed to treat steroid-induced atrophy. However, no standard procedure has been established for normal saline injection in terms of quantity and time interval between sessions. Normal injectable saline was administered every other week for 3 months, followed by 3 months' rest. During follow-up, the response was satisfactory. As far as the authors are aware, this is the first demonstration of this method's applicability to cases of steroid-induced atrophy in pediatric settings.

Keywords: steroid-induced atrophy, normal saline, pediatric

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INTRODUCTION

Steroids are used in a variety of settings, from allergic reactions to severe diseases such as toxic epidermal necrolysis. There are several methods of administering steroids, including intra-lesional or intramuscular injection, oral and inhalational. Steroid-induced fat atrophy after intramuscular or intradermal injection is a serious issue ¹. The condition lasts for at least 2-3 months after injection. Steroids are precipitated in tissues and can induce fat cell atrophy, collagen degeneration, and fibroblast reduction ². Normal-saline injection can turn the precipitated steroid into solution that can be removed from the body ³. There is no standard method to measure the amount of normal saline injection or its interval; although weekly or monthly injection has been suggested in several studies ^{4,5}. Fat grafts and filler have also been used to correct these depressions, but have the downsides of being expensive and transient, respectively ^{1,6}.

In this study, 7-17 ml of injectable normal saline was administered intradermally and

subcutaneously in the sites of atrophy until the defects were corrected. No overcorrection was done. The procedure was repeated once every 2 weeks for 6 sessions (3 months), with follow-up happening after 3 months. Both patients showed significant improvement.

CASE REPORT

Case 1

The patient was a 4-years-old girl, who had been receiving intramuscular injections of hydrocortisone due to asthma and allergic reactions for the past two years. Two months after her last injection, her mother noticed a large depression in the right buttock (Figure 1). After local anesthesia with topical lidocaine, 17 ml injectable normal saline was injected intradermally and subcutaneously to correct the defect. This procedure was repeated once every two weeks for a period of three months; however, in the ensuing sessions the amount of normal saline was gradually decreased. In the last session (6th

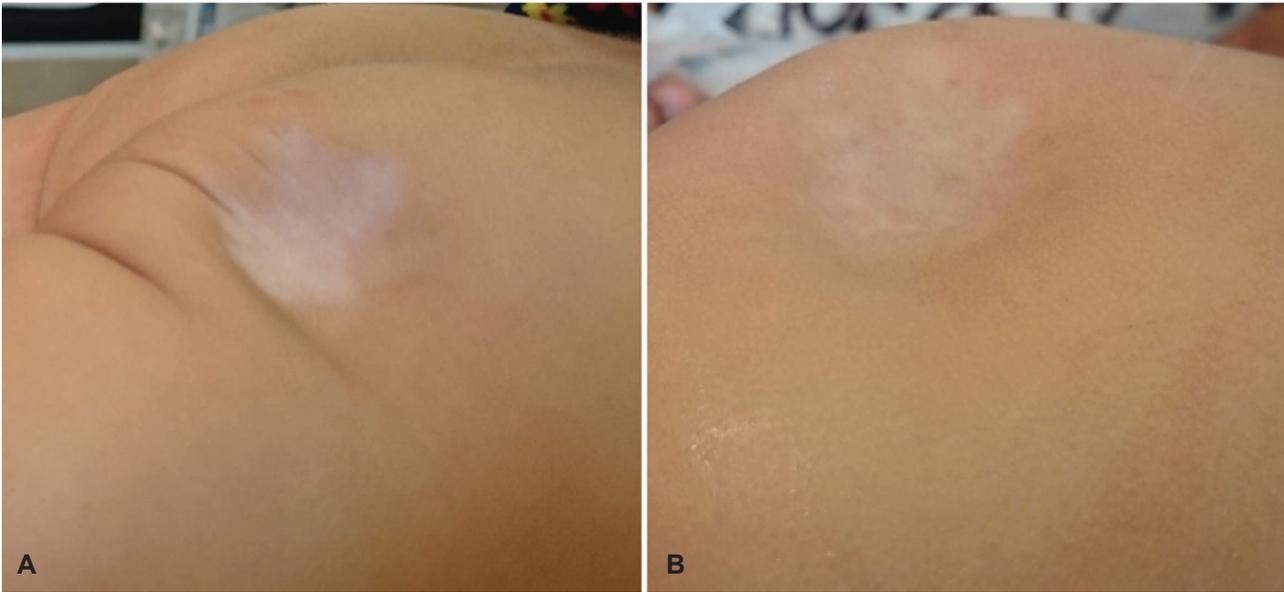


Figure 1. (A) The first patient at presentation, (B) 3 months after the last session

session), only 7 ml normal saline was administered. When the patient returned after 3 months, the spot had returned to its normal shape and only steroid-associated leukoderma was observed (Figure 2).

Case 2

The patient was a 14-year-old girl who had received an intramuscular injection of triamcinolone prior to oral administration of isotretinoin for severe acne vulgaris. She noticed a significant depression in the site of triamcinolone injection in her right buttock a month after the injection (Figure 3). Similar to the previous case, injectable normal saline was used to treat the deformity. Fifteen ml of normal saline was injected in the first session, the amount gradually reducing to 8 ml in the last session (6th session) (Figures 4). The defect was completely corrected after a rest period as long as in the previous case (Figure 5).

DISCUSSION

Steroid-induced fat atrophy is a serious concern¹ that appeared at least 2-3 months after injection. Following precipitation, it can induce fat cell atrophy, collagen degeneration, and fibroblast reduction.

Other modalities, such as fat transfer and filler injection have limitations that can make the normal saline injection preferable. For example, fat graft is expensive and difficult to perform, while filler correction can be temporary. Normal saline injection, on the other hand, is readily available, inexpensive and easy to use for treatment of steroid atrophy. As far as the authors are aware, no study to date has discussed this modality in pediatric populations.

After Shiffman MA who introduced normal saline injection as a treatment for steroid atrophy in 2005, questions about interval between sessions were raised³. It seems that steroid cannot destroy fat cells, but it can deplete their fat content³.



Figure 2. (A) The second patient at presentation, (B) 5th session, (C) 3 months after the last session

He proposed that after saline injection, fat cells require 3-4 weeks to accumulate fat; hence, he advised 1 month interval between sessions³. In a corticosteroid atrophy case reported by Samantha L. normal saline was injected monthly, but for a period of 9 months⁵. Shumaker and et al., used the same method on a weekly basis; their patients requiring 4-8 sessions before a satisfactory result was achieved⁴.

Hence, we decided to use 2-weeks-long intervals between our treatment sessions to improve the efficacy of treatment, and to reduce treatment time. Administration of normal saline for 3 months, combined with a rest period of 3 months produced a satisfying result.

CONCLUSION

According to the results, we found that normal saline injection with this new protocol, can be an effective modality for treating steroid-induced skin atrophy.

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REFERENCES

1. Brodell DW, Johnson SM. Use of intralesional poly l lactic acid in the treatment of corticosteroid induced lipoatrophy. *Dermatol Surg.* 2014;40(5):597-599.
2. Dahl PR, Zalla MJ, Winkelmann RK. Localized involutinal lipoatrophy: a clinicopathologic study of 16 patients. *J Am Acad Dermatol.* 1996;35(4):523-528.
3. Shiffman MA. Letter: Treatment of local, persistent cutaneous atrophy after corticosteroid injection with normal saline infiltration. *Dermatol Surg.* 2010;36(3):436.
4. Shumaker PR, Rao J, Goldman MP. Treatment of local, persistent cutaneous atrophy following corticosteroid injection with normal saline infiltration. *Dermatol Surg.* 2005;31(10):1340-1343.
5. Margulies SL, Morris A. Successful treatment of lipoatrophy with normal saline. *JAAD Case Rep.* 2015;1(6):415-417.
6. Imagawa K, Ohkuma S. A case of fat injection for treating subcutaneous atrophy caused by local administration of corticosteroid. *Tokai J Exp Clin Med.* 2010;35(2):66-69.