# Localized Lipoatrophy Following Glatiramer Acetate Injections: A Case Report of Treatment With Intralesional Normal Saline

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Lipoatrophy at glatiramer acetate injection sites occurs in approximately 50% of multiple sclerosis (MS) patients and can be both disfiguring and permanent. To minimize the appearance of depressions at glatiramer acetate injection sites in a patient with MS, we employed a novel therapeutic modality in which normal saline was infiltrated into lipoatrophic plaques until blanching was noted. This treatment was administered weekly for a total of 4 treatments and successfully minimized the appearance of cutaneous depressions. Assessments by both the patient and physician indicated improvement in skin contour.

Normal saline is effective in restoring skin contour depressions related to corticosteroid-induced lipoatrophy and also may be a successful treatment of lipoatrophy induced by glatiramer acetate injections. Further studies are needed to elucidate the exact mechanism by which normal saline restores surface contour related to lipoatrophy from glatiramer acetate injections. *Cosmet Dermatol.* 2011;24:466-468.

Lipoatrophy at glatiramer acetate injection sites in patients with multiple sclerosis (MS) can be disfiguring and permanent.[1] The incidence of lipoatrophy occurring at glatiramer acetate injection sites has been reported to range from 45% to 64%.[2,3] It has been proposed that inflammation at the injection site induced by the drug results in the loss of subcutaneous fat, regardless of injection technique or number of treatments.[2,4,5] Edgar et al[2] noted that lipoatrophy and skin abnormalities were the most influential reasons for discontinuing treatment with glatiramer acetate in up to 33% of patients who demonstrated atrophic changes (N=34) related to the injections. However, cessation of treatment does not guarantee that lipoatrophy will not progress.[1,3] Hashimoto et al[1] reported a case of lipoatrophy resulting from glatiramer acetate injections that progressed for up to 32 months after cessation of therapy.

Therapeutic options reported in the literature to minimize the appearance of injection-site depressions or to restore normal skin contour have been lacking. We report

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*The authors report no conflicts of interest in relation to this article.*

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the successful treatment of lipoatrophy at glatiramer acetate injection sites in a patient with MS using intralesional normal saline.

## CASE REPORT

A 40-year-old woman with a 10-year history of MS presented to our clinic with multiple asymptomatic depressions on her abdomen and thighs of 4 years' duration. She reported daily self-administration of subcutaneous glatiramer acetate injections for 7 years with good control of her MS and no exacerbations of her disease. Concomitant medications included interferon beta-1a injected subcutaneously 3 times weekly, which she started 3 years prior to commencing glatiramer acetate injections, with no complications. The patient denied prior erythema, pruritus, pain, or burning in the atrophic sites; she also denied prior trauma and use of other parenteral drugs or corticosteroid injections in the affected areas. A review of systems was negative. Her medical history indicated polycystic kidney disease complicated by episodes of pyelonephritis. The patient denied prior biopsies at any of the affected sites. On clinical examination, the patient demonstrated multiple well-circumscribed, nonindurated, depressed, flesh-colored plaques on her abdomen (Figure, A and B) and anterolateral thighs, ranging in size from 1 to 7 cm in diameter and 0.3 to 0.8 cm in depth. The patient was diagnosed with lipoatrophy resulting from glatiramer acetate injections.

Based on prior success with the use of normal saline to treat corticosteroid-induced lipoatrophy,[6] we elected to treat the patient's lipoatrophy with normal saline injections. To determine if normal saline injections would demonstrate a similar response in lipoatrophy resulting from glatiramer acetate injections, a 5-mL syringe with a 25-gauge, 0.5-in needle was used to inject a total of 30 mL of bacteriostatic normal saline to approximately 10 sites on the mid and left abdomen. Injections continued until protrusion of the affected area was accomplished. Immediate blanching was noted when the normal saline infiltrated but resolved without complication within 2 hours.

The patient returned 1 week after the initial injection and noted improvement at the treated sites; she wanted additional treatment. Using a 25-gauge spinal needle, a total of 450 mL of bacteriostatic 0.9% sodium chloride was injected into the subcutaneous plane to approximately 20 sites on the mid abdomen, flank, and thighs using an infiltrating pump. A 25-gauge spinal needle was used to cover the entire affected area more efficiently than a 30-gauge needle while still maintaining patient comfort. The patient returned for 2 additional treatments, each separated by 1 week. Both the physician and patient noted a 50% improvement in the appearance of her atrophic plaques by the fourth treatment (Figure, C and D). To maintain these results, the patient returned every 2 months for 3 additional treatment sessions and has now sustained these results for 9 months without treatment.

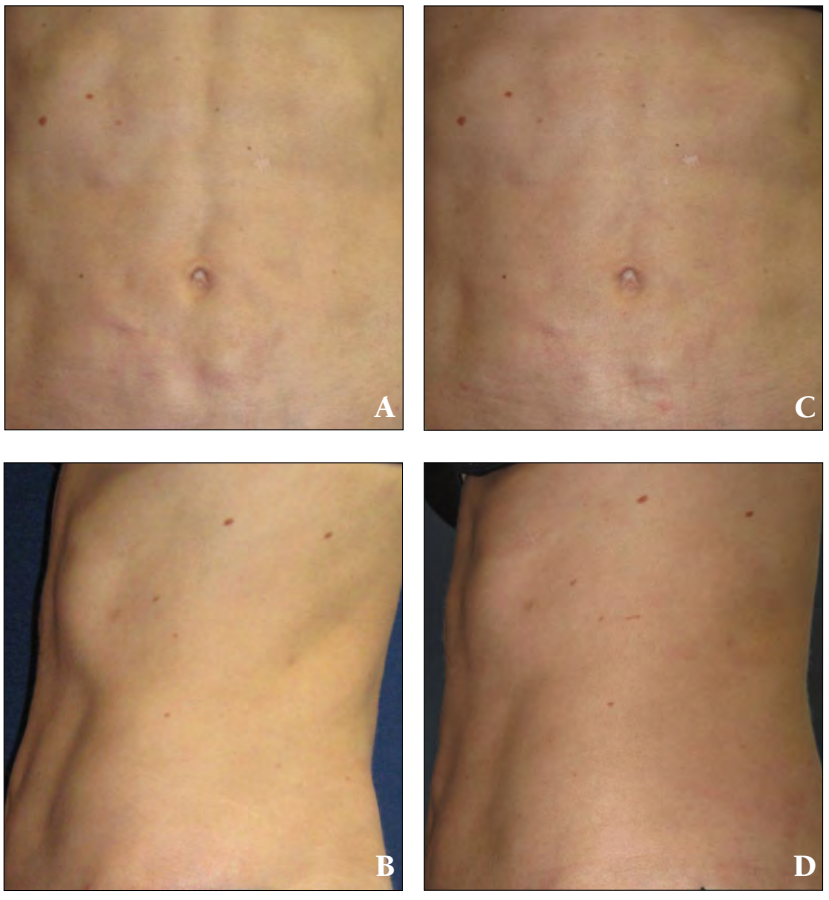
## COMMENT

Glatiramer acetate has proven to be effective in minimizing disability and reducing the rate of relapse in patients with relapsing-remitting MS.[3] This highly immunogenic drug was first developed to suppress experimental allergic encephalomyelitis. It is probable that the efficacy of glatiramer acetate in treating MS can be attributed to its high immunogenicity[3]; not surprisingly, this attribute also may be the reason for the incidence of lobular panniculitis at injection sites, which may ultimately result in lipoatrophy.[3,5]

Lipoatrophy rarely is associated with interferon beta therapy. According to a PubMed search of articles indexed for MEDLINE using the terms *lipoatrophy* and *interferon beta*, a total of 10 known cases of lipoatrophy from interferon beta therapy have been reported in the literature.[7-9] Unlike our patient, all 10 patients experienced erythema, swelling, and pain at the injection sites prior to the development of lipoatrophy. Also, 5 patients presented with hard, indurated, lipoatrophic plaques with livedo reticularis, which was not demonstrated in our patient.[7-9]

In studies of patients presenting with long-standing lipoatrophy from glatiramer acetate injections and no epidermal changes, histopathologic evaluations consistently have demonstrated prominent septae with diminution in the size of fat lobules and fibrosis of the subcutis. The inflammatory infiltrate has been reported to vary from minimal to dense lobular panniculitis.[2-4] A resemblance of involutional corticosteroid-induced lipoatrophy has been noted in some cases.[3]

Success has been achieved using normal saline infiltration to treat corticosteroid-induced lipoatrophy. In 6 reported cases, saline was chosen as a therapeutic modality because of its low cost, availability, lack of allergenicity, and safety profile.[6,10] It is hypothesized that normal saline infiltration is an effective means of restoring skin contour in corticosteroid-induced lipoatrophy by resuspending and redistributing poorly soluble corticosteroid crystals as well as physically severing microscopic fibrous adhesions to underlying tissue.[6,10] Fibrosis has been reported in histologic analyses of cases of lipoatrophy resulting from glatiramer acetate injections.[2-4] The efficacy of this treatment may rely on the release of similar fibrous adhesions in cases of lipoatrophy from glatiramer acetate injections. This effect can be considered tumescent subcision, which occurs from releasing the tethering forces binding




Nonindurated, depressed, flesh-colored plaques on the abdomen (A) and left flank (B). Marked improvement of localized lipoatrophy was seen after 4 treatments of normal saline administered weekly over 1 month (C and D).

down the superficial skin to the subcutis and renewal of skin delineation.[6]

## CONCLUSION

Lipoatrophy can be both physically disfiguring and psychologically impairing. We report a therapy for the restoration of surface contour from lipoatrophy caused by glatiramer acetate injections in MS patients. Further studies are needed to elucidate the exact mechanism by which normal saline restores surface contour related to lipoatrophy from glatiramer acetate injections.

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