

Iodine Iontophoresis in Reducing Scar Tissue

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A 24-year-old housewife was referred for treatment to improve active and passive extension and flexion of the right great toe. The patient had undergone a bunionectomy that resulted in an 8-cm longitudinal scar over the dorsal surface of her right hallux extending from just proximal to the metatarsophalangeal joint to just distal to the interphalangeal joint. The suture line was dry and well healed.

Examination revealed intact sensation and proprioception, with trace active movements of flexion and extension at both the metatarsophalangeal and interphalangeal joints. Passive flexion and extension at the interphalangeal joint was within normal limits. Passive flexion and extension range of motion at the metatarsophalangeal joint was 5 degrees. The limitation was believed to be due to postsurgical scarring over the tendon of the extensor hallucis longus muscle. The patient had pain at the right great toe upon early toe-off of the swing phase. There was, however, no gait deviation.

While under the care of a podiatrist, the patient received five consecutive daily treatments of ultrasound over the scar and stretching, with no noticeable improvement. In addition, she experienced a moderate amount of pain after each session. The treatments were given in the podiatrist's office by his nurse.

After consulting her physician, we gave the patient a treatment of iontophoresis at the physical therapy department. The ion decided upon was iodine, from Iodex[®] ointment, because it is sclerolytic and is effective in reducing scar tissue.¹ The iodine increases the extensibility of the scar and therefore increases the effectiveness of stretching following iontophoresis.

The patient was positioned supine with the right leg supported on a pillow for comfort. Iodex[®] was massaged over the scar and surrounding area after cleaning the dorsal surface of the hallux and forefoot. Gauze pads (4 in × 4 in) were moistened in warm

water and were applied evenly over the treatment area. Five folded moist paper towels were placed over the gauze. A tin electrode was molded to fit the contour of the toe and was held in place by an elastic strap. Care was taken to avoid folds in the toweling under the electrode that could cause areas of excessive current and subsequent burns.¹ The tin electrode was connected to the negative pole of a low-volt generator† with an alligator clip. The positive electrode was about one half the size of the negative electrode and was prepared in a similar manner but without the ion ointment. The electrode was secured over the right anterior thigh. Firm contact was maintained with a light weight sandbag. The galvanic current flow was gradually increased to 5mA and held constant for 20 minutes. The patient experienced a mild tingling and warmth under both electrodes. After 20 minutes the current was slowly reduced, the electrodes removed, and the underlying skin inspected for irritation. The skin was massaged gently with Alkolave Gel†† and dusted with talcum powder to sooth the skin and control itching.

Following iontophoresis, passive stretching and active flexion and extension were employed to achieve additional range of motion while taking advantage of the loosened scar. The patient was instructed in a home program of range-of-motion exercises and proper heel-toe gait activities to be performed several times daily. Iontophoresis was administered for five consecutive days. Evaluation at the final treatment session revealed normal range of motion in flexion and extension of all joints of the great toe and a significant increase in muscle strength to a good grade. The patient was discharged with a home program of daily exercises to increase strength further.

A six-month follow-up examination of the great toe revealed normal range of motion of all joints and normal strength of flexor and extensor muscles, with a gait pattern free of deviations.

REFERENCE

1. Kahn J: *Low Volt Technique*. Syosset, NY, Joseph Kahn, Publisher, 1973

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* Iodex with Methyl Salicylate, Dist. by Lambda Pharmacal Labs, Inc, Plainview, NY 11803.

† Stimulator Clinic, Elmed Inc, Addison, IL 60101.

†† Alkolave Gel, Dist. by Plough, Inc, Memphis, TN 38151.