

CASE REPORT

Effect of Contractubex phonophoresis on postsurgical scar of carpal tunnel release: A case report

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Key Clinical Message

Contractubex phonophoresis can be used in clinical setting to manage postsurgical scar after carpal tunnel release. Contractubex phonophoresis can improve pliability, height, and tenderness of the scar.

Abstract

Scar is one of the most common complications after open release of carpal tunnel. Scars are mentally and physically disturbing, and they can result into itching and pain. Scar after release of carpal tunnel can lead to compression of median nerve and failure of surgery. Various treatments are suggested for scar management. Topical drugs are one of these treatments. Phonophoresis of topical drugs can enhance delivery of topical drugs. In present case, author report the effect of phonophoresis of Contractubex on postsurgical scar after carpal tunnel release. Result indicated that phonophoresis of Contractubex can be effective in scar management.

KEYWORDS

carpal tunnel syndrome, Contractubex, phonophoresis, scar, ultrasound

1 | INTRODUCTION

Carpal tunnel syndrome (CTS), compression of the median nerve at the wrist, is the most common nerve entrapment. Pain, paresthesia in the median nerve distribution area in the hand, and weakness or atrophy of the hand muscles are clinical symptoms of CTS. These impairments may lead to loss of hand dexterity and disability.¹ CTS can be managed nonsurgically or surgically. Nonsurgical management is advised for mild and moderate CTS.² Surgery for CTS is one of the most often performed procedures. Surgical management includes endoscopic carpal tunnel release (ECTR) approach or open carpal tunnel release (OCTR). Surgical

management are prescribed after failure of conservative treatment or patients with severe symptoms.^{3,4} OCTR is a well-established surgical management of CTS.⁵ OCTR has some complications including scar formation, scar tenderness, pillar pain, slow recovery, and higher incidence of persistent pain and weakness. OCTR remains the preferred surgical procedure for CTS in most orthopedic practices. Complications after OCTR can lead to time lost from work and patient dissatisfaction.⁶ Hypertrophic scar is a significant problem following postsurgical injuries. These type of scars develop as the result of a proliferation of dermal tissue and alterations in the normal processes of wound healing.⁷ Characteristic of Hypertrophic scars is exaggerated

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extracellular matrix deposition that lead to increased skin tension. Hypertrophic scars represent as elevated nodules or plaques associated with pruritus, pain, erythema, and cosmetic disfigurement.⁸ Late recurrence of CTS after OCTR is thought to be due to scar formation that can entrap the nerve. This extraneural scar affect gliding of and blood flow to the nerve.⁹ Different treatments have been suggested for abnormal scars. Management of hypertrophic scars has not yet been solved and management includes topical agents, corticosteroid, excision, cryotherapy, laser therapy, compression therapy. These treatments have adverse effects. Onion extract gel and silicone gel are two main topical agents suggested for the prevention and management of hypertrophic scars.⁸ Onion extract gel has antiproliferative and anti-inflammatory effects.¹⁰

Transdermal drug delivery is an alternative method to the injection and oral administration of drugs.¹¹ It is claimed that Contractubex can be effective in the management of scars.¹² Contractubex contains heparin, allantoin, and onion extract.⁸ The stratum corneum of skin prevents penetration of the drugs through the skin. Phonophoresis is a noninvasive, fast and painless method that improves delivery of medications percutaneously.^{11,1} Although some previous studies evaluated the effect of topical drugs on hypertrophic scars,^{8,10,12} but there are little studies assessed efficacy of Contractubex phonophoresis on scars after OCTR. Effective management of scars after OCTR can decrease the risk of failure of this surgery. Current case study reports the Effect of Contractubex phonophoresis on postsurgical scar after carpal tunnel release.

2 | CASE REPORT

A 45-year-old woman referred to physiotherapy after carpal tunnel release surgery. She had OCTR for carpal tunnel release 40 days ago. Physiotherapist focused mainly on scar management to decrease adhesion and paresthesia. For this reason, Physiotherapist used Contractubex phonophoresis with ultrasound (215X, Novin Company, Iran) on postsurgical scar to enhance efficacy of Contractubex on scar. For Contractubex phonophoresis patients was in comfortable position. Ultrasound (3 MHz, pulse 50%, intensity: 0.5 W/cm², 5 min per session) was applied on scar by using Contractubex gel. Frequency of sessions was three times/week. Phonophoresis was done for 10 sessions. Scar assessment was done using Modified Vancouver scar scale to assess scar characteristics (height, vascularity, pigmentation, and pliability) before and after treatment. After 10 sessions of phonophoresis, pliability of the scar improved (change from scale 3 to scale 2). Height



FIGURE 1 Scar before phonophoresis.

of the scar decreased (change from scale 2 to scale 1) and Patient reported subjectively that tenderness was decreased significantly compared to first session of physiotherapy (Figures 1 and 2).

3 | DISCUSSION

Topic of this case report is scar management after OCTR because CTS is considered the most frequent cause of neuropathic disability in adults.¹³ The result of present case study demonstrated that Contractubex phonophoresis can improve pliability of the scar and decrease height of the scar. Postsurgical scar is one of the main chronic complication of OCTR. In this case author focused on scar management because hypertrophic scars after OCTR can lead to failure of surgery and secondary surgery. Secondary surgeries carry significant risks because of adhesion and fibrosis.¹⁴ Scars cause discomfort, itching, contracture, pain, functional impairment, and cosmetic concern.¹⁵ Scar spread to the connective tissue beneath the skin and muscles and decrease range of motion of joint and impair daily activities.¹¹ Various treatment exists for management of hypertrophic scars. Most of these treatment have limited success and prevention of scars is more important than treatment.¹⁵

Transdermal delivery of drug has some advantages compared to oral administration and injection.¹⁶ Usually physiotherapist use ultrasound for management of scar. In this case, author used Contractubex phonophoresis for scar management because phonophoresis include advantage of both ultrasound and medical drug and Contractubex gel is one of the topical drugs suggested for scar management.¹⁰ Contractubex gel can control bacteria, inflammation, and proliferation of fibroblast.¹⁷



FIGURE 2 Scar after phonophoresis.

Some previous studies have indicated the effectiveness of this drug on hypertrophic scars, but other studies suggest that it is not effective and should be used combined with silicone gel.¹⁸ Transdermal drug delivery using phonophoresis can overcome resistance of skin¹⁷ and can increase the transdermal absorption of drug.¹¹ The mechanism of phonophoresis includes thermal effects, connective transport, cavitation, and mechanical stresses.¹³ Advantages of phonophoresis include noninvasiveness, good compliance, low cost, and minimal gastrointestinal side effects.¹⁹

There is limited studies about impact of Contractubex phonophoresis for scar management after OCTR, but there are some studies evaluated effect of Contractubex on other conditions. Gonchakov et al. evaluated the advantage of topical Contractubex on postsurgical scars of children with congenital cleft lip and palate. Results have shown high efficacy and safety of Contractubex for management of postsurgical scars.²⁰ Okur et al. in another study determined the effects of topical Contractubex gel in burn scar. The results indicated that vascularity, flexibility, and height of the scars improved significantly.¹⁸ Beuth et al. compared treatment of hypertrophic scars with Contractubex and intralesional corticosteroid. Authors reported that Contractubex allowed for a significantly shorter period of scar normalization than the corticosteroid group. Contractubex was associated with significantly fewer adverse events than corticosteroid injections.⁸ Ereny et al. compared the effect of silicone gel,

Contractubex gel, and corticosteroid phonophoresis for postburn hypertrophic scars. Results indicated that silicone phonophoresis is more effective method for postburn hypertrophic scar management than Contractubex phonophoresis or corticosteroid phonophoresis.¹² Another research conducted by Hassanpour1 et al. evaluated the efficacy and safety of onion extract and silicone gel on hypertrophic scars of the upper extremity. Authors concluded that there was not significant difference between groups.¹⁰ Willital et al. In another study assessed Efficacy of Contractubex gel in treatment of fresh scars after thoracic surgery in children and adolescents. Authors concluded that Contractubex gel is useful in scar treatment after thoracic surgery.²¹

4 | CONCLUSION

According to the result of present case study it seems that Contractubex phonophoresis may be a practical method to manage scars after OCTR. Further investigations in larger sample size are needed.

AUTHOR CONTRIBUTIONS

Fateme Bokae: Conceptualization; methodology; writing – original draft; writing – review and editing.

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FUNDING INFORMATION

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DATA AVAILABILITY STATEMENT

The data that support the results of present case study are available on request from corresponding author of study.

ETHICS STATEMENT

Patient signed written informed consent form to publish his report.

CONSENT

Written informed consent form was signed by the patient.

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