Proposal For The Study of Acupuncture's Efficacy in the Treatment of Scar Tissue

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Abstract

Millions of Americans undergo surgery each year leaving scars that last a lifetime. For many, their scars hurt or leave the surrounding area numb. Scars are often perceived as unsightly by the individual, especially those with hypertrophic or keloid scars, and can make them self-conscious. From a Chinese medical perspective, scars can block the proper flow of qi and blood leading to imbalances within the body. It is hypothesized that local acupuncture along the perimeter of scars can reduce their size, visibility, pain level and degree of numbness. An observational case series study is proposed to examine the effects of acupuncture on postoperative abdominal scars of at least 3 inches in 100 participants. If successful, this study will lead to the widespread use of acupuncture to treat scarring.

Keywords: Acupuncture, Scar, Postoperative-Scarring, Pain, Numbness, Keloid, Hypertrophic Scar

Introduction

Research Problem

Millions of people across the globe have scars. The Center For Disease Control reported an estimated 48.3 million surgical procedures were performed in the United States in 2010 alone. (Hall) Often scars are unsightly and can cause pain or numbness around the scarred tissue. The American Academy of Dermatology classifies scars into cicatrix or flat, hypertrophic or rasied, atrophic or depressed, keloid or large-raised and contracture or tight. (AAoD) Clinically acupuncture has been observed to reduce the size of scars even years after formation, decrease pain and occasionally reduce numbness around the scar. A literature search on PubMed yields very few results about acupuncture for the treatment of scars. More study is required. The purpose of this proposal is to study the efficacy of acupuncture to reduce the size, visibility, pain and numbness of postoperative scars using an observational case series design.

Previous Research

A literature search on PubMed for “acupuncture AND scar tissue” in English yields 27 articles. Only 7 deal directly with the treatment of scars using acupuncture. The remainder are unrelated or examine scarring caused by acupuncture or moxa. There were no systematic reviews available and few clinical trials. Of the limited studies available, most found some benefit using acupuncture to treat scars and reported the need for further research. For example, the Du study found that electroacupuncture on Stomach 36 alleviated postoperative intraabdominal adhesions formation. (Du) The Cuignet and Loskotova studies examined pain relief and tissue healing related to scarring from burns.

The significance of this research is to evaluate acupuncture's effect to heal post-operative scars by reducing scar tissue, scar visibility, pain and restoring sensation when numbness exists around the surgery site.

Proposed Research

Perform an observation research study, case series design, examining the effects of reducing postsurgical scarring, visibility, pain level and surrounding numbness in patients who had postoperative abdominal scars of 3 inches or more. The proposed research may culminate in a more widespread use of acupuncture to treat scarring.

Hypotheses

H0-1 (null hypothesis): Acupuncture has no effect on reducing postoperative scarring.

H1-1 (alternative hypothesis): Acupuncture reduces size and visibility of postoperative scars.

H0-2 (null hypothesis): Acupuncture does not lessen postoperative scar pain or numbness.

H1-2 (alternative hypothesis): Acupuncture does lessen postoperative scar pain and numbness.

Background and Significance

Literature Review

Mechanical signal transduction from acupuncture on the fascia can have a potent impact, including autocrine and paracrine cellular effects, with modification of the surrounding extracellular matrix and stimulate the synthesis of proteins. (Langevin)

Acupuncture can trigger a cascade of local responses leading to tissue remodeling and a reduction of inflammation. (Langevin) It is hypothesized that this mechanism is involved in acupuncture's ability to reduce scars. Scarring was reduced by the cholinergic anti-inflammatory effect of acupuncture in rats who had abdominal surgery designed to produce adhesions. (Du)

A case report of a 48-year-old woman suffering severe scar pain for 3 months saw an improvement from 7 to 1 on the Likert scale with 10 being the worst pain and 0 being no pain. (Fang)Patient was treated 8 times over 5 weeks with acupuncture needles surrounding the perimeter of the scar. (Fang)

1008 burn patients were treated with acupuncture as part of the acute first aid. Study results showed improvement in microcirculation, elimination of dynamic lymphatic and venous insufficiency, shorter subsequent healing and reduction in hypertrophic scar formation. (Loskotova).

28 patients were treated for mild to moderate contracture of the neck with limited range of motion due to local scarring. Needling was done from the lateral side into the tension line of the scar. (Chen) 16 patients had marked improvement in range of motion and release of contracture. 12 had moderate improvement. (Chen)

As so few studies have been conducted on acupuncture's treatment of scars, there is a clear gap in the literature.

Relevance

Millions of Americans will deal with postoperative scarring. For many, the appearance of a scar is a source of insecurity and embarrassment. Others deal with pain around the scar or numbness. From a Chinese medical perspective, breaking down scar

tissue helps restore the proper qi and blood flow through the affected area. If safe and simple fine acupuncture needling of scars can reduce their size and effect, its advantageous to make the treatment widely available.

Proposed Intervention

A minimum of 100 patients with a 3-inch postoperative abdominal scar or larger will be selected for the observational case series study. There will be no cost to the patient for participating in the study. 10 licensed acupuncturists within the greater Los Angeles area will administer the treatments. Participants selected must live within 5 miles of acupuncture clinic. Digital photographs of the scars will be taken at the onset and conclusion the study for comparison and publication. Scars will be measured for length and width. Width will include 3 measurements roughly a third of the way each along the scar. The widest area of the scar will also be noted. Participants will be surveyed before and after the course of treatment. Treatment shall consist of weekly acupuncture for 12 weeks. 15-millimeter-long, 38 gauge sterile single use acupuncture needles will be used. Needles to be placed around the entire perimeter of the scar using the Wei Ci technique or “surrounding the dragon”. Needle retention is to be for 30 minutes. No electroacupuncture will be utilized.

A visual analog pain scale assessment (VAS) will be employed to determine if patients experience any pain in the scar or its immediate vicinity and to determine the baseline of pain for that individual. Second, a Likert scale assessing how the participant feels about the scar (are they embarrassed by the scar, does it limit their activities, keep them from exposing the area) will be employed at onset and repeated on conclusion of the course of treatment. A Short-formMcGillPainQuestionnaire2(SF-MPQ-2) will be

administered, the "gold standard" according to Li, with the numbness measure placed at the top of the list. Participants are to complete VAS, SF-MPQ-2 and Likert scales in waiting room, not in front of the clinician to minimize bias and turned into front desk staff.

Methods

Study Design

An observation research study, case series design, examining the effects of reducing postsurgical scarring, visibility, pain level and surrounding numbness in patients who had abdominal scars of 3 inches or more. Quantitative scar measurements will be taken of length and width in millimeters. VAS and SF-MPQ-2 will be used as quantitative measures of pain and numbness as well as a Likert scale for measuring the patient's insecurity about their scar.

Acupuncture

Administered weekly for 12 weeks. 38 gauge 15-millimeter-long sterile single use filiform acupuncture needles will be inserted approximately every 2 millimeters along the entire perimeter of the scar. Appropriate needle depth will be determined by the acupuncturist. Clean needle technique to be employed. Needles to be retained for 30 minutes each treatment and then disposed of in a medical waste sharps container.

Research Questions

Is acupuncture effective to reduce the size of postoperative scars? Can acupuncture effectively treat pain in and around postoperative scars? Can acupuncture reduce the visibility of scars? How effective is acupuncture in restoring lost sensation

around postoperative scars?

Population and Sample

The sample of qualified participants will be selected from inclusion criteria. The collective target population of 100 participants is estimated to be sufficient.

Participant recruitment

Over a period of 12 months, flyers seeking participation will be distributed to the community, including 30 local MDs (internists, dermatologists, abdominal, bariatric and trauma surgeons), 10 chiropractors, 10 naturopathic physicians and 20 acupuncturists, 10 local businesses and two public libraries. In addition, electronic versions of the flyers will be posted on social media forums.

Inclusion criteria

Participants must be between the ages of 18 and 60 years old. Live within 5 miles of a participating acupuncture clinic. Be available weekly for 12 consecutive weeks. Have a means of transportation to and from appointments. Participants must be able to speak and write in English. Scars can be between one month and 15 years old. Hypertrophic, keloid and as well as noncomplicated scars are ok.

Exclusion criteria

Active skin infections, psoriasis, skin cancer or other dermatological ailments on or adjacent the scar. Medications that effect wound healing time and capacity such as chemotherapy and steroids. Diabetes.

Sampling Procedures

Among the qualified participants, convenience sampling will be utilized in accordance with inclusion and exclusion parameters.

Data Collection Procedures

Signed consent forms will be maintained in a secure location. Participants will be given time to complete the VAS, SF-MPQ-2 and Likert scales at the first and last appointments. Front office staff will be trained to help administer the questionnaires which will be completed in the absence of the acupuncturist to reduce bias. Treating acupuncturist will measure the physical dimensions of the scar and record them at onset and completion. Participants will not be pressured to complete the course of acupuncture treatments and may withdraw at any time.

Instruments

Questionnaires will be utilized to determine the level of pain and numbness as well as how the participant feels about the scar. All questionnaire and measurements to be done at onset and conclusion. VAS, SF-MPQ-2 and Likert scales will be employed. Using a medical ruler, 1 measurement will be taken of the scar length and 4 of scar width (roughly equidistant) and reported in millimeters. The widest point of the scar will be measured as well.

Data Analysis

The demographic characteristics of the patients will be described using mean and standard deviation (SD). Percentages of improvement from baseline in the VAS, SF-MPQ-2 , Likert scale and scar measurements will be calculated for individual cases and the group as a whole. The percentages will be calculated by dividing the difference between the baseline and endpoint scores by the baseline score. Values of $P<0.05$ will be

considered statistically significant. Tables will be made tracking the changes in scar length and width with statistical analysis. Onset and conclusion photos will be included.

Significance

Expected Findings

Proposed observational case series study is expected to find significant improvement in the remediation of scar tissue, reduction in scar pain, lessening of surrounding numbness and lightening of the visual impact of scars.

Importance

The study will fill a gap in the scientific knowledge base and address an issue that millions of Americans face, scarring. It will further demonstrate the safety and efficacy of acupuncture and lead to a wider adoption of it as a treatment modality.

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