

An Observational Study of Comparative Effectiveness of Different Manual Scar Therapy Techniques

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Abstract:

Background: Scar management remains a significant challenge in clinical practice, with various manual therapy techniques being employed to improve scar appearance, sensitivity, and functionality. This study aimed to evaluate the effectiveness of different manual scar therapy methods, including massage therapy, myofascial release, desensitization therapy, lymphatic drainage, and stretching and strengthening exercises.

Methods: A quantitative, observational study was conducted with 100 participants aged 18 to 60 years, who had surgical or trauma scars. Participants were randomly assigned to one of five treatment groups corresponding to different manual therapy techniques. Treatments were administered over 12 weeks, with assessments for scar appearance, pain level, mobility, and sensitivity conducted pre- and post-treatment.

Results: Massage therapy showed a 30% improvement in scar visibility, while myofascial release led to a 25% improvement in scar texture and a 40% reduction in pain. Desensitization therapy resulted in a 50% reduction in scar sensitivity. Lymphatic drainage and stretching exercises significantly improved swelling and mobility, respectively. All treatments demonstrated statistically significant improvements in their targeted areas.

Conclusion: The study concluded that various manual scar therapy techniques effectively address different aspects of scar management. Each method showed significant benefits in specific areas, such as appearance, pain reduction, and mobility enhancement.

Recommendations: Future research should explore the long-term effects of these therapies and consider integrating multiple techniques for comprehensive scar management. Personalized therapy plans based on individual scar characteristics and patient needs are recommended for optimal outcomes.

Keywords: Scar Management, Manual Therapy, Myofascial Release, Pain Reduction.

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Introduction

Scar tissue can be a significant concern for many individuals, whether it results from surgery, injury, or skin conditions like acne. Not only scars affect physical appearance, but they can also lead to discomfort and limited mobility, depending on their location and severity. Over the years, various manual scar therapy techniques have been developed and refined to address these issues. This article explores the effectiveness of different manual scar therapy methods, comparing their benefits and limitations.

Before delving into the treatment methods, it's essential to understand what scar tissue is. Scar tissue forms as part of the natural healing process. It is fibrous tissue that replaces normal skin after an injury. While it helps in healing, scar tissue is often denser and less flexible than the original skin, leading to functional and aesthetic concerns.

Massage therapy is one of the most common methods for treating scar tissue. It involves applying pressure and manipulating the scar and surrounding tissues. This technique can help in breaking down the scar tissue, improving circulation, and promoting flexibility. Studies have shown that regular massage can significantly improve the appearance and texture of scars [1].

Myofascial release focuses on the connective tissue (fascia) surrounding muscles and organs. By applying gentle, sustained pressure, this technique aims to release tension in the fascia, improving mobility and reducing scar-related discomfort. It's particularly effective for deep scars that affect muscle movement [2]. Desensitization therapy is used primarily for scars that are sensitive or painful to touch. It involves gradually exposing the scar to different textures and pressures to reduce sensitivity.

ty over time. This method is often used for burn scars or after surgical procedures [3].

Lymphatic drainage is a gentle massage technique that helps promote the flow of lymphatic fluids around the scar area. This can reduce swelling and improve the healing process, particularly in scars that have caused significant tissue damage [4].

Incorporating stretching and strengthening exercises can be beneficial, especially for scars that limit movement. These exercises help maintain the range of motion and prevent the scar tissue from becoming too tight [5].

The choice of scar therapy technique depends on various factors, including the age and type of scar, the individual's overall health, and the specific goals of therapy (e.g., improving appearance vs. increasing mobility). It's crucial to consult with a healthcare professional or a certified therapist to determine the most appropriate approach.

The study's objective was to assess the impact of scar manual therapy in conjunction with supplementary techniques on scars left behind after surgery.

Methodology

Study Design: This study employed a quantitative, observational design to assess the effectiveness of various manual scar therapy techniques.

Study Setting: The research was conducted at 'PMCH' spanning a duration from 'April 2022 to July 2022.

Participants

The study involved 100 participants, both male and female, aged between 18 and 60 years, who had developed scars due to surgery or trauma within the past year.

Inclusion Criteria

- Individuals aged 18 to 60 years.
- Presence of a surgical or trauma scar not older than one year.
- Willingness to participate in the study and adhere to the treatment schedule.

Exclusion Criteria

- Presence of keloid scars.
- Undergoing other scar treatments during the study period.
- History of allergic reactions to any of the manual therapy components.
- Pregnant or breastfeeding women.

Bias: To minimize bias, participants were randomly assigned to different treatment groups. Blinding was implemented where participants were not informed about the specific type of manual therapy they were receiving.

Variables: Variables included type of manual scar therapy (e.g., massage therapy, myofascial release), scar appearance (size, color, texture), pain level, and range of motion near the scar area.

Methodology: Participants were randomly divided into groups, each receiving a specific type of manual scar therapy. The therapies were administered by trained therapists over a period of 12 weeks, with sessions occurring twice a week.

Data Collection and Analysis: Data were collected through physical examinations, participant questionnaires, and photographic evidence of scars before and after treatment.

Range of motion was measured using goniometry, and pain levels were assessed using the Visual Analog Scale (VAS).

Statistical Analysis: Data were analyzed using SPSS software. Comparative analysis was conducted using ANOVA for continuous variables and Chi-square tests for categorical variables. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations: Ethical approval was obtained from the Institutional Review Board (IRB). Participants were provided with detailed information about the study, and written informed consent was obtained.

Results

Table 1: Effectiveness of various manual scar therapy techniques

Therapy Technique	Improvement in Scar Appearance	Pain Reduction	Improvement in Mobility	Reduction in Scar Sensitivity	Reduction in Swelling
Massage Therapy	30% reduction in visibility	Moderate	Minimal	Minimal	Minimal
Myofascial Release	25% improvement in texture	40% decrease (VAS)	Significant	Moderate	Moderate
Desensitization Therapy	Minimal	Significant	Minimal	50% reduction in sensitivity	Minimal
Lymphatic Drainage	20% improvement in texture	Moderate	Moderate	Moderate	35% improvement
Stretching & strengthening	Minimal	Minimal	15% increase in motion	Minimal	Minimal

The study comprised 100 participants, evenly split with 50 males and 50 females. The age range was 18 to 60 years, with a mean age of 35 years. Predominantly, the scars treated were surgical in nature (60%), while the remaining 40% were due to trauma.

In terms of treatment efficacy, each manual scar therapy technique demonstrated specific benefits. Participants in the massage therapy group experienced a significant reduction in scar hardness and discoloration, with an average 30% reduction in scar visibility on a standardized scale. The myofascial release group showed notable improvements in the range of motion near the scar area, with a 25% improvement in scar texture and a 40% decrease in pain levels as measured by the Visual Analog Scale (VAS). Desensitization therapy led to a substantial decrease in scar sensitivity, achieving a 50% reduction. Lymphatic drainage was particularly effective in reducing scar-related swelling, showing a 35% improvement in swelling and a 20% improvement in skin texture. Lastly, the group undergoing stretching and strengthening exercises saw an improvement in mobility and flexibility, with an average increase in range of motion by 15%, though changes in scar appearance were minimal.

The comparative analysis revealed that myofascial release and desensitization therapy were most effective in pain reduction and reducing scar sensitivity, respectively. Massage therapy stood out in improving the appearance of scars, and lymphatic drainage was significant in reducing swelling. The improvements in each treatment group were statistically significant, with p-values less than 0.05, as indicated by ANOVA tests.

Discussion

The study's key findings indicate that various manual scar therapy techniques have distinct impacts on scar management. Massage therapy showed a significant 30% reduction in scar visibility, making it particularly effective for improving the aesthetic appearance of scars. Myofascial release stood out for its ability to enhance mobility, with a notable 25% improvement in scar texture and a 40% decrease in pain levels. Desensitization therapy was highly effective in reducing scar sensitivity, achieving a 50% reduction. Lymphatic drainage demonstrated its strength in reducing swelling associated with scar tissue, while stretching and strengthening exercises primarily improved mobility around the scar area.

The effectiveness of these therapies can be attributed to their specific mechanisms of action. Massage therapy likely improves scar appearance by promoting blood flow and breaking down scar tissue. Myofascial release's impact on mobility and pain reduction may be due to its ability to release tension in the connective tissue surrounding muscles.

The success of desensitization therapy in reducing sensitivity suggests that gradual exposure to different textures and pressures can effectively retrain the nervous system's response to stimuli. Lymphatic drainage's role in reducing swelling could be linked to its ability to enhance the lymphatic system's function, thereby reducing fluid buildup. The benefits of stretching and strengthening exercises in improving mobility highlight the importance of maintaining a range of motion in scar management.

The present study highlighted the significant impact of different manual therapies on scar management, with specific techniques like massage therapy and myofascial release showing notable benefits in scar appearance and mobility. This aligns with the findings of [6], which supported the use of manual therapy for non-specific shoulder pain and ankle sprains, indicating its effectiveness in managing pain and improving mobility in certain conditions.

Similarly, the study [7] on thoracic manual therapy for non-specific shoulder pain found that this specific manual therapy technique accelerated recovery and reduced pain and disability. This is in line with the study's findings where specific manual therapies like myofascial release significantly reduced pain levels and improved the range of motion, underscoring the potential of targeted manual therapies in enhancing functional outcomes.

On the other hand, the study on acupuncture and dry needling for physical therapy of scars, which focused on the effectiveness of these techniques for scar treatment, presents a different approach to scar management [8]. While the current study did not explore these particular methods, the success reported in this report suggests that integrating such techniques could potentially enhance the overall effectiveness of scar therapy programs.

Conclusion

The study demonstrated that various manual scar therapy techniques have distinct and significant effects on improving scar characteristics, including appearance, sensitivity, and mobility. Myofascial release and desensitization therapy were particularly effective in pain management, while massage therapy showed the most significant improvement in scar appearance. These findings suggest that manual scar therapy can be an effective component of comprehensive scar management strategies.

Limitations: Some limitations of the study included the short duration of treatment and follow-up. Long-term effects of these therapies were not assessed. Additionally, the study did not account for variations in scar types and locations, which might affect the generalizability of the results.

Recommendations: Future research should explore the long-term effects of these therapies and

consider integrating multiple techniques for comprehensive scar management. Personalized therapy plans based on individual scar characteristics and patient needs are recommended for optimal outcomes.

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List of abbreviations

VAS - Visual Analog Scale
TMD – Temporo-mandibular Disorders
MTP - Manual Therapy Program
NSSP - Non-Specific Shoulder Pain
BCRL - Breast-Cancer-Related Lymphedema
LLLT - Low-Level Laser Therapy
HMF - High Magnification Factor
PUR - Postpartum Urinary Retention

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