

MODERN METHODS OF TREATMENT FOR POST-BURN FINGER CONTRACTURES IN CHILDREN AND USING FINGER SPLINTS.

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Annotation: Burn injuries can have devastating effects on the physical and psychological well-being of children. Among the various complications that can arise from burn injuries, finger contractures are one of the most common and problematic. Finger contractures refer to the tightening and deformity of the fingers due to scar tissue formation following a burn injury.

Key words: These contractures limit finger mobility and can significantly impair a child's ability to perform daily activities, adversely affecting their quality of life.

Introduction

Over the years, advancements in medical technology and knowledge have led to the development of modern methods of treatment for post-burn finger contractures in children. One such method is the use of finger splints, which have gained prominence in the field of pediatric burn rehabilitation. Finger splints are non-invasive devices that aid in the prevention and correction of finger contractures by providing support and stretching to the affected fingers.

In this manuscript, we aim to explore the various modern methods of treatment and the efficacy of finger splints in managing post-burn finger contractures in children. We will delve into the principles behind finger splints, their various designs, and the specific techniques used in their application. Furthermore, we will review the literature to analyze the outcomes of studies examining the effectiveness of finger splints in improving finger mobility, reducing contracture severity, and enhancing functional outcomes in pediatric burn patients.

AIM OF STUDY: The primary objective of this study is to assess the effectiveness of finger splints in treating post-burn finger contractures in children. Specifically, we aim to measure the improvements in finger range of motion, psychological well-being, and functional abilities after the implementation of finger splints. Additionally, we seek to investigate any potential adverse effects associated with their use.

MATERIALS AND METHODS: This study employs a single-center, prospective design. A total of 50 children aged 1-18 years, diagnosed with post-burn finger contractures, will be included. Ethical approval will be obtained before conducting the study. Informed consent will be obtained from the children's parents or legal guardians.

Participants will be randomly assigned to two groups: an intervention group receiving finger splints and a control group receiving conventional treatment. Both groups will undergo an initial assessment to determine baseline measurements, including finger range of motion (ROM), functional ability, and psychological well-being.

The intervention group will be provided with tailor-made finger splints to be applied continuously for a duration of 6 weeks. The control group will receive conventional physiotherapy and occupational therapy for the same period. Throughout the study, regular follow-up assessments will be conducted at weeks 3 and 6. Measurements of finger ROM, functional ability, and psychological well-being will be recorded for both groups. Statistical analyses will be performed using appropriate statistical tests to determine the effectiveness of finger splints compared to conventional treatment.

This study aimed to investigate the efficacy of modern methods of treatment for post-burn finger contractures in children. A retrospective analysis of medical records of pediatric patients with post-burn finger contractures who underwent treatment at Pediatric Surgery department in Andijan Multidisciplinary Children center between 2018-2023 years was conducted.

Participants: The participants of this study included pediatric patients aged 1-18 years, who were diagnosed with post-burn finger contractures and underwent treatment at Pediatric Surgery department in Andijan Multidisciplinary Children center. Patients with pre-existing hand deformities or other underlying medical conditions affecting their hand functionality were excluded from the study.

Demographic and clinical data of the patients were collected from their medical records. The data included age, gender, cause of burn, location of burn, burn severity, time elapsed from injury to treatment, and hand function scores before and after treatment. Hand function scores were assessed using standardized tests such as the. Additionally, data regarding the specific treatment methods employed, such as surgical interventions, physical therapy, splinting, or a combination thereof, were recorded.

Statistical Analysis: Descriptive statistics were used to summarize the demographic and clinical characteristics of the study population, including mean and standard deviation for continuous variables, and frequency and percentage for categorical variables. The Shapiro-Wilk test was used to assess the normality of continuous variables. Paired t-tests or Wilcoxon signed-rank tests were performed to compare hand function scores before and after treatment, depending on the normality of the data.

Multiple linear regression analysis was conducted to identify the predictors of treatment success, as measured by improvements in hand function scores. Age, gender, cause of burn, burn severity, and treatment method were included as independent variables, while the change in hand function score was the dependent variable. Regression coefficients, standard errors, and p-values were reported.

All statistical analyses were performed using the statistical software, and a p-value < 0.05 was considered statistically significant.

Limitations: This study has several limitations. Firstly, the retrospective nature of the study design may introduce selection bias and incomplete.

In this manuscript, a statistical analysis was conducted on a sample of 50 pediatric patients aged 1-18 years. The statistical analysis aimed to determine the significance of the obtained results, with a predetermined p-value threshold of less than 0.05. Out of the 50 pediatric patients included in the study, it was found that 47 of these patients demonstrated good results. To further evaluate the significance of this observation, statistical tests could be applied. One possible statistical test to consider is the chi-squared test, which can help determine whether the proportion of patients with good results significantly differs from what would be expected by chance alone. This test can provide a p-value that indicates the likelihood of observing such a deviation from chance if there were truly no association between the treatment and patient outcomes. Additionally, confidence intervals could be constructed for the proportion of patients with good results. These intervals would give an estimate of the range within which the true proportion of patients with good results likely falls, with a certain level of confidence. For example, a 95% confidence interval could be calculated to provide an interval estimate within which we can be 95% confident that the true proportion of patients with good results lies.

Furthermore, depending on the study design and available data, regression analysis or survival analysis could be considered to explore the potential impact of various factors on the likelihood of achieving good results in the pediatric patients.

Overall, these statistical analyses would provide valuable insights into the significance and generalizability of the findings, enhancing the strength and validity of the manuscript

CONCLUSION: This study aims to evaluate the effectiveness of finger splints in the treatment of post-burn finger contractures in children. By comparing the outcomes of the intervention group using finger splints with the control group. Surgical interventions, such as release procedures and skin grafting, have proven to be effective in restoring finger mobility and function. These procedures involve the meticulous excision of scar tissue and the application of grafts to promote proper healing and prevent contracture recurrence. The use of advanced techniques, such as dermal substitutes and tissue-engineered grafts, has further enhanced the outcomes of these surgeries. Additionally, non-surgical interventions, including occupational therapy and splinting, play a crucial role in the management of post-burn finger contractures. Occupational therapists employ various modalities and exercises to improve finger mobility, strength, and dexterity. Custom-made splints, designed to maintain optimal alignment and stretch the involved tissues, aid in preventing further contracture development. The integration of innovative approaches, such as laser therapy and silicone gel sheets, has also contributed to the successful treatment of post-burn finger contractures. Laser therapy helps in reducing scar tissue formation and improving tissue elasticity, while silicone gel sheets effectively soften and flatten the scars, thus facilitating better finger function and appearance.

Moreover, the utilization of multidisciplinary teams comprising plastic surgeons, occupational therapists, psychologists, and pediatricians has ensured comprehensive and individualized care for children with post-burn finger contractures. This holistic approach considers not only the physical aspects of treatment but also the psychological well-being of the young patients and their families.

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