CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

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Project Number

31747

Project Title

Surgical Management of Burned Feet Contractures: Reconstructive Release Resulting from Various Surgical Aspects

Abstract

Objectives/Goals

Burn wounds frequently scar and cause long term complications. Burn scars on the feet and toes may contract, and distort the tissue underneath to prohibit natural function. Various treatment techniques are available, yet the procedure undertaken by the individual surgeon. By comparing previous manuscripts on the surgical management of this issue, a compilation of data was created and analyzed in order to create a recommendation for treatment of this issue with the best overall result to the burned foot.

Methods/Materials

Articles and manuscripts were found using OvidSP Medline, and collected from University of Michigan#s Taubman Health Sciences Library. Summaries were made on each article. Procedural, patient, and post-operative data was recorded in charts.

Results

By reviewing past medical records at the Shriners Burns Institute from 1986 to 1990, 68 children were documented with regards to the functional and aesthetic results of reconstructive surgery to the foot. Certain complications include gross hyperextension, subluxation of toes, syndactyly, abnormal gait, growth deformities, and a loss in range of motion. Burn patients are recommended to have respiratory and nutritional support, followed by early surgical excision, grafting, and splinting. We are 99% confident that the population proportion of all patients that undergo early excision therapy who require a reconstructive procedure lies between 0.919 and 0.308, while that of patients that undergo conservative therapy is between 0.141 and 0.219. We are 99% confident that the population proportion of all patients that undergo 3 point splints and still require a reconstructive procedure lies between 0.168 and 0.572, while that of patients that undergo conservative therapy is between 0.0144 and 0.286.

Conclusions/Discussion

Early excision therapy for burns is found to lower complication rate in burn scars compared to conservative therapy. Skeletal suspension is not recommended, though the Ilizarov wire suspension apparatus can be used to correct burn scar contractures. Small burn scar contractures can be corrected easily with a z-plasty or flap. It was found that by releasing both the longitudinal and transverse arches, the average interval for a recurrence surgery in prolonged.

Summary Statement

Due to flexibility in medical treatment of burn scar contractures on the foot, this epidemiological study uses statistics to provide a recommendation for the surgical approach to this problem.

Help Received

Dr. Paul Cederna, for giving me the opportunity to stay at the Biomedical Sciences Research Building. Dr. Melanie Urbanchek, for providing me so many chances to gain laboratory experience in my three week stay. Nicole Castagno, for spending the time to instruct me in various lab procedures, such as H&E stains.

Preliminary