

Classification and Approach to Surgical Management of Burn Contractures of the Toes

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Abstract

Background: Burn contracture of the toes is a common sequela of thermal injury to the foot. Without proper treatment patients experience significant functional and social limitations. We define a new classification of toe burn scar contractures (TBSC) that will allow surgeons to tailor definitive surgical treatment based on the individual needs of the patient's condition.

Methods: A retrospective review was performed on 275 TBSC releases (20 patients) from 2000 to 2010 at the University of Michigan. A classification system based on contracture complexity was developed to describe each TBSC as mild, moderate, or severe. Mild TBSC involved scarring of the superficial tissues only and were treated with scar excision or local tissue rearrangement. Moderate TBSC required skin grafts and occasional tendon lengthening. Severe TBSC involved deeper structures and necessitated a patient-specific technique where multiple procedures were utilized.

Results: There were 6, 3, and 11 patients with mild, moderate, and severe TBSC, respectively. The mean number of required primary procedures per toe increased with increasing burn complexity (1.1, 1.5 and 1.8), with severe TBSC requiring more primary procedures overall (13.7 in severe vs. 2.8 in mild TBSC) (Table 1). Complication rates per toe were highest for severe TBSC (59.0%). Secondary operations were only required with severe TBSC and 40% of severe TBSC experienced major complications which required another operation.

Table 1. Mean primary procedures, mean primary procedures per toe, mean secondary operations, and primary complication rate of mild, moderate, and severe TBSC.

Burn complexity	Mean Primary Procedures	Mean Primary Procedures Per Toe	Mean secondary operations	Primary Complication Rate
Mild	2.8	1.1	0	29.2%
Moderate	2.7	1.5	0	42.5%
Severe	13.7	1.8	1.1	59.0%

Conclusion: An individualized surgical approach based on TBSC severity is recommended for addressing burn contracture of the toes. Analysis of the specific structures involved allows for correct classification of the severity and dictates the interventions necessary for satisfactory reconstruction.

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