Upper Extremity Friction Burns in Pediatric Patients

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Abstract

Background: Pediatric burns most frequently involve hands and fingers. While thermal injury represents the majority of this type of trauma, friction burns are becoming more prevalent due to increased utilization of hazardous household consumer products. The purpose of this study was to identify the etiology, presentation, characteristics, and treatment of pediatric friction burn injuries of the upper extremity.

Methods: A retrospective chart review was performed. Patients presenting with upper extremity friction burns from 2002 to 2012 were reviewed. Demographic data, clinical presentation, treatment, and outcomes were evaluated.

Results: Sixty-nine patients sustained upper extremity friction burns. Average age at injury was 3.3 years (range, 0.7-10.6), and time to presentation was 16.6 days (range, 0-365). Mean follow-up was 6.6 months (range, 0-59.6). Mechanism of injury included treadmills (n=63) and vacuum cleaners (n=6). Burn distribution was similar between both groups: forearm (6%), wrist (4%), hand (25%), and fingers (65%); although, vacuum cleaner injuries involved a single digit (most often the thumb) while treadmill injuries affected multiple digits (p=0.0001), sparing the thumb (p=0.01). Twenty-one patients (30%) underwent surgical procedures, but only 3 patients (4%) required acute intervention. All surgical patients sustained treadmill burns that were more severe, resulting in full-thickness injuries (p=0.0001) and disabling contractures (p<0.05). While all patients with vacuum-induced burns were treated conservatively, hyperpigmented scarring was more prevalent in these patients compared to the treadmill group (p=0.003). All vacuum-induced burn patients had full range of motion and function with conservative treatment alone.

Conclusions: Friction burns to the upper extremity from treadmill and vacuum mechanisms pose a significant health hazard for the pediatric population. Injuries from vacuum cleaners are less prevalent and severe, exhibit unique patterns of involvement, and can be treated conservatively with good functional outcomes. In contrast, treadmill burns are more common and severe, often requiring surgical intervention.

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