



Western Health

Friction Burns from Sporting Equipment in the Paediatric Population

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Introduction

Burns are a common form of injury in the paediatric population. There is an increased incidence of friction burns caused by sporting equipment seen with the rise in affordability and popularity of home exercise equipment. There is also an increasing trend towards the mechanisation of exercise. Equipment such as treadmills causes not only friction burns on skin, but also damage to deeper structures.

At Western Health, we have noted an increased incidence of exercise equipment related friction burns, in particular the curious toddler age group. Such injuries, often being a full thickness burn to the palm of the hand, while small in terms of total body surface area, can have debilitating functional outcomes from the resultant scarring or damage to underlying tendon or nerve.

This case series of children injured with burns from sporting equipment discusses the assessment and management and raises awareness of such injuries and strategies to prevent them from occurring.

Method

Evaluation of paediatric cases identified all cases treated at Western Health due to friction burns between January 2018 – June 2019. The incidence of treadmill burns, age, gender, characteristics and management of the burns were explored.



Figure 1: Typical treadmill burn

Results

There were 4 patients treated between 2018 – 2019 due to accidental injury from treadmills at home. The average age of 5.5 years old (range 2 - 10 years old). Three children had upper limb injuries, of which two required surgery with skin graft reconstruction; the third child was managed with dressings. One child had lower limb injuries, which required surgical debridement. One of the children with upper limb injuries later required scar management with the use of taping.

Age & Gender	Injury	Burn Depth	Time to Surgery (Days)	Surgery	Outpatient Appointments	Post-operative Issues
2M	Plantar R) great toe	Centrally, small area full thickness, peripherally deep partial	1	Debridement of wound	0 (FTA)	Unknown
10M	Volar R) MF, RF, LF	Full thickness	2	Debridement and FTSG	5	Partial FTSG loss to MF and RF
4M	Volar R) IF, MF, RF	Full thickness	0	Debridement and FTSG and repair 100% zone I FDP to MF	7	None
6F	Volar R) IF, MF, RF	Centrally deep partial, peripherally superficial	Managed conservatively	None	4	None

Table 1: Demographics and Results Summary

FTA: failed to attend; FTSG: full thickness skin graft, IF: index finger; LF: little finger; MF: middle finger; RF: ring finger

Discussion

The majority of the patients that sustained treadmill friction burns were within the preschoolers (<6 years old) age group. Our results reflect that of other studies, as children in this age group tend to be curious about their environment and desire to imitate the actions of adults. The location of injuries inflicted were on the upper limbs and involved the hands further reflective of current research on this topic.

Treadmill friction burns are often significant requiring surgical intervention such as debridement or skin grafting. This often results in prolonged immobilisation, scar management and possible dysfunction in this critical period of their development.

The aim of our study focuses on raising public awareness on the significance of friction burns in home sporting equipment and advocates for further health education on this topic. Incorporating physical safeguards, health promotion campaigns, and new regulations need to be considered to protect this vulnerable age group.

Conclusion

Friction burns due to treadmills continue to contribute significant morbidity within the paediatric population. Despite good surgical outcomes obtained in the short-term, often there is ongoing long-term monitoring and follow-up post injury. Further health education and regulations need to be incorporated to help decrease the threat of friction burns due to sporting equipment within the paediatric population.