

A Full-Thickness Burn in a Teenager Resulting from Prolonged Contact with a Mobile Phone Charging Cube: A Case Report

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ABSTRACT

We present a case of a teenager who suffered a full-thickness burn following prolonged contact with a mobile phone charging cube. The patient required primary surgical excision and closure of the wound resulting in a good clinical outcome. There have been multiple reports in the literature of burns resulting from lithium batteries; however, this appears to be the first case report of a full thickness burn resulting from a mobile phone charging cube. Given the ubiquity of mobile phone use among teenagers, primary care providers should warn patients about the risks of sleeping with an electronic device while it is connected to a charger.

KEYWORDS: mobile phone charging cube, full-thickness burn, teenager

INTRODUCTION

Mobile telephone use is virtually ubiquitous among American teenagers with 88% either having, or having access to, a mobile phone and 73% possessing a smartphone.¹ This demographic reports spending on average nine hours per day on their mobile device with 72% claiming that the first thing they do upon awakening is check for messages on their phone.² To date there have been a handful of cases of cell phone-associated burns reported in the medical literature, all of which were caused by the phone's lithium battery.³ As reported by Palmeri, et al, lithium batteries have allowed the battery size to decrease while capacity increases, further expanding their use in portable devices. With the increased use we have also seen increased reports of injuries associated with these batteries.⁴ To date, there have not been any reports in the medical literature of burns resulting from prolonged contact with a mobile telephone charging cube versus the battery itself. We present a case of a teen who sustained a full-thickness burn as a result of prolonged contact with the charging cube of a mobile telephone.

CASE PRESENTATION

A 17-year-old white female presented to the pediatric burn clinic for evaluation of a lesion on her left wrist. The patient reported going to bed with her phone charger plugged into an extension cord and the phone and charging cube pulled up into the bed. In the morning, she noted a red area above her wrist where the charging cube had been in contact with her skin throughout the night while she slept. As the day progressed, she noticed it began to form a blister which proceeded to worsen with time. (Figure 1) She was evaluated by her pediatrician the following day and subsequently referred to the pediatric burn clinic.

The patient presented with a circular wound two centimeters in diameter on the dorsal aspect of her forearm, approximately three centimeters proximal to her left wrist crease, which was notable for significant step-off (level of healthy tissue was higher than the wound) and eschar, consistent with a third-degree burn. (Figure 2) The burn was initially managed conservatively with daily dressing changes. At follow-up two weeks later the patient requested surgical intervention to speed healing and expedite return to her activities. The patient subsequently underwent primary excision and

Figure 1. Appearance of burn at initial presentation to pediatrician.



Figure 2. Appearance of burn at presentation to burn clinic.



Figure 3. Appearance of burn at post-operative follow-up visit to burn clinic.



closure of her wound. At follow-up several months later, she was noted to have linear scar approximately 5 cm in length and 2mm raised above the skin. Silicone gel sheeting was added with pressure to decrease thickness of scar. She was then seen a few months later and the scar had decreased in thickness and the patient was pleased with the improvement in the scar's appearance. (Figure 3)

DISCUSSION

There are few reports in the medical literature documenting burns associated with mobile telephones. A 2015 literature review identified six cases of burns associated with cell phone use, all a result of malfunction of the lithium battery.³ Two cases of electrical injuries associated with cell phone chargers were reported by Kato et. al. in 2013. Both cases involved individuals who fell asleep on the electrodes of the charging device leading to low-voltage cutaneous injuries.⁵ Here we report a case of a patient who sustained a full-thickness burn that resulted from prolonged contact with a cell phone charging cube.

A search of regulatory reports of cell phone-associated burns did not reveal any cases of burns sustained as a result of prolonged contact with the charging cube. In May of 2018, Bluefin voluntarily recalled their wireless charging device due to multiple reports of the device overheating; however, no burn injuries were reported.⁶ The United States Consumer Products Safety Commission also documents recalls of cell phone batteries due to fire and burn hazards.^{7,8} There have been multiple reports in the medical literature of burns caused by the lithium batteries associated with e-cigarette devices. These reports describe both electric and chemical burns to the lower extremities and face resulting from explosion of the lithium battery.⁹⁻¹¹

This case illustrates a mechanism of action of a full-thickness burn not previously reported in either the medical or lay literature. Given the ubiquity of cell phone use among youth in the United States, it is important to warn about this danger and recommend never sleeping with an electronic device while it is connected to a charger.

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Disclaimer

The views expressed herein are those of the authors and do not necessarily reflect the views of the Alpert Medical School, the Department of Emergency Medicine, the Department of Surgery or the Rhode Island Burn Center.

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