

Case report

Burn from car seat heater in a man with paraplegia: case report

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Objective/background: Heated car seats are a common feature in newer automobiles. They are increasingly being recognized as potential hazards as there have been multiple reports of significant burns to its users. The potential for harm is considerably increased in those with impaired sensation with the possibility of a devastating injury.

Methods: Case report and literature review.

Results: A 26-year-old male with a T8 ASIA A paraplegia presented to the outpatient clinic for management of a hip burn. Two weeks prior to his visit he was driving a 2004 Jeep Cherokee for approximately 30 minutes. He was unaware that the driver's side seat warmer was set on high. He denied that his seat belt was in direct contact with the skin of his right hip. He presented to an acute care hospital that evening with a hip burn where he was prescribed silver sulfadiazine cream and instructed to apply it until his scheduled follow-up clinic visit. In clinic, the hip wound was unstageable with approximately 95% eschar. A dressing of bismuth tribromophenate in petrolatum was applied to the wound and he was instructed to change the dressing daily. This was later changed to an antimicrobial alginate dressing. The ulcer eventually healed.

Conclusions: This case illustrates the significant risk of car seat heaters in individuals with spinal cord injuries or neurological impairment who have decreased sensation. Additionally, it highlights an atypical area of potential for burn. Furthermore, it emphasizes the need for a heightened awareness for this unique and dangerous situation.

Keywords: Burns, Paraplegia, Rehabilitation, Injury prevention, Wound care

Introduction

Heated car seats are a more common feature in newer automobiles. They are increasingly being recognized as potential hazards as a result of multiple reports of significant burns. The potential for harm is considerably increased in those with impaired sensation. There are multiple case reports of patients who utilized heating pads or hot water bottles post-operatively for pain relief and developed burns that required transverse rectus abdominis myocutaneous flaps and abdominoplasty resulting in denervation and sensory loss.¹⁻⁴ Additionally, patients with diabetic neuropathy utilize hot water bottles to warm their feet, which may result in burns.^{5,6} Furthermore, skin integrity may be compromised by exposure to cold packs as well.⁶ In general, burns have been reported as occurring in the dependent areas, e.g. sacral and gluteal regions.⁷⁻¹¹ It is vital to

raise awareness of this health hazard and prevent future thermal injuries. This case report presents a patient with a T8 ASIA A spinal cord injury (SCI) who developed a right hip burn secondary to a car seat heater.

Case history

The patient is a 26-year-old man with T8 ASIA A SCI who presented to the outpatient clinic for management of a recent right hip burn. Two weeks prior he drove a sports utility vehicle for approximately 30 minutes, which was the total time of exposure, unaware that the driver's side seat warmer was set on high. His seat belt was not in direct contact with his hip skin. He subsequently noted a right hip burn and sought medical attention at a local area trauma center. The patient was evaluated by the emergency room physician and prescribed silver sulfadiazine cream twice daily. He also continued to perform appropriate pressure reliefs. The patient presented to our outpatient clinic 2 weeks

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Figure 1 Right hip burn (not trochanteric).

later. On physical examination, the right hip wound was observed posterior and inferior to the trochanter of the hip. The burn measured 5.7 cm in length and 3.6 cm in width (Fig. 1); it could not be staged. There was approximately 95% eschar with no drainage. A dressing of bismuth tribromophenate in petrolatum was applied to the wound and he was instructed to change the dressing daily until the eschar fell off. He was subsequently evaluated in the outpatient clinic 2 months later. On reassessment, the wound measured approximately 4 cm in length and 3 cm in width, consistent with a healing deep dermal burn. Drainage was noted from the site and an antimicrobial alginate dressing was applied. The patient was subsequently followed up in outpatient clinic 4 months later and the right hip was noted to have a 5.7 cm in length \times 3.6 cm in width hyperpigmented patch of skin representing the well-healed site of the previous burn.

Discussion

Heated car seats are now a common feature in automobiles. Although considered a luxury accessory, they are increasingly recognized as potential hazards, especially in those with impaired sensation. Multiple consumers have identified faulty seat heaters ultimately warranting manufacturer recalls. Recall notifications for owners of 2001–2004 Jeep Grand Cherokee were sent to owners because the front seat electric heater elements had overheated causing fire or injury.^{12,13}

Studies indicated a temperature of 120°F for approximately 10 minutes of contact is sufficient to cause full thickness burns on human skin. However, lesser temperatures for prolonged periods can produce deep

dermal or full thickness burns.¹⁴ One study performed by injury lawyers demonstrated car seat heater temperatures reaching more than 135°F, even as high as 160°F. More than 400 people have been affected by faulty seat heaters, with at least 30 of those being people with paraplegia or tetraplegia who sustained severe burns.¹⁵ Once individuals with impaired sensation develop a burn, they are at increased risk of developing pressure ulcers. To avoid placing pressure on the healing wound, they compensate by placing pressure on other areas that may be more susceptible to the development of ulcers.

Car seat heater burns can have a significant impact on the daily activities.⁹ There are several case reports of individuals with SCI sustaining deep dermal and full thickness burns. One case demonstrates a 42-year-old with paraplegia who sustained deep dermal and full thickness burns to the low back and sacral areas from a heated car seat. The patient required admission to a burn intensive care unit and subsequent multiple reconstructive surgeries.⁷ A 48-year-old with paraplegia developed a full thickness gluteal burn from a seat heater on the initial drive of his new vehicle. Testing of the car's seat heater demonstrated temperatures of 95–120°F.⁸

In the case presented here, the patient developed a right hip burn secondary to a car seat heater in his 2004 Jeep Grand Cherokee. There are no reported cases to our knowledge of hip burns related to car seat heaters. The Jeep Grand Cherokee has side heating elements which could potentially cause a hip burn.¹⁶ Seat heater temperatures of a sample 2004 Jeep Grand Cherokee (the patient's Jeep was unavailable for testing) revealed that temperature reached at least 98°F on the low setting and 106°F on the high setting. It is certainly possible based on the above recalls that this patient's seat heater may have malfunctioned and exceeded 106°F. Clearly, what seems to be a luxury feature is a significant hazard to those with impaired sensation.

Conclusion

This case illustrates the significant risk of car seat heaters in individuals who have decreased sensation, e.g. individuals with SCI, diabetes, or vascular disease, or even young children. Additionally, it highlights an atypical area of burn development. It emphasizes the need for a heightened awareness by the health-care provider, consumer, and manufacturer for this unique and dangerous situation. There is a lack of specific warnings regarding seat heater hazards for individuals with sensory impairment. In addition, given the high incidence of vehicle recalls, there is no clear way to detect faulty heating

systems that overheat. Health-care providers should educate their patients with impaired sensation of their risk for thermal injuries from car seat heaters.

Acknowledgement

The authors would like to acknowledge Danielle Schiff, MD, for her time and efforts on behalf of this manuscript.

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