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Case report

Use of mineral oil Fleet enema for the removal of a large tar burn: A case report

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ABSTRACT

Introduction: Extensive hot tar burns are relatively uncommon. Management of these burns provides a significant clinical challenge especially with respect to tar removal involving a large total body surface area (TBSA), without causing further tissue injury.
Methods: We report a case of an over 40-year old male construction worker who was removing a malfunctioning cap from broken valve. This resulted in tar spraying over the anterior surface of his body including legs, feet, chest, abdomen, arms, face and oral cavity (80% TBSA covered in tar resulting in a 50% TBSA burn injury).
Results: Initially, petrolatum-based, double antibiotic ointment was used to remove the tar, based on our previous experience with small tar burns. However, this was time-consuming and ineffective. The tar was easily removed with mineral oil without irritation. In order to meet the demand for quantity of mineral oil, the pharmacy suggested using mineral oil Fleet enema (C.B. Fleet Company, Inc., Lynchburg, Virginia, USA). The squeezable bottle and catheter tip facilitated administration of oil into the patient's construction boots and under clothing that was adhered to the patient's skin.
Conclusions: Tar removal requires an effective, non-toxic and non-irritating agent. Mineral oil is such an agent. For patients that may present with a large surface area tar burn, using mineral oil Fleet enema is a viable option that facilitates application into difficult areas.
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1. Introduction

Extensive hot tar burns are relatively uncommon and occur mostly within the paving and roofing industries. Tar, crude oil, and asphalt oil are synonyms for mineral products created by long-chain petroleum and coal or fossil hydrocarbons. Tar is produced from the destructive distillation of coal, and in preparation for use, is heated to approximately 232 degrees Celsius [1]. Direct contact to the skin can result in full thickness burns as it continues to transfer heat while it is adherent. Management of this class of thermal injury provides

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a significant clinical challenge especially with regards to tar removal. Tar is problematic to remove as it may penetrate clothing, entangle in the hair and adhere to the skin. Failure to completely remove the tar may result in suboptimal wound healing and increase the potential for infection. The literature advocates the importance of early cooling and using liquid solvents such as Medi-Sol® adhesive remover or petroleum-based creams for tar removal [4]. However, treatment recommendations are based largely on reports involving small surface area burns [2,3]; there is no current literature describing tar removal for an extensive body surface area. Due to lack of evidence, the agents actually used are often dependent on hospital availability and clinical preference.

2. Case report

We report a case of an over 40-year old male construction worker who was removing a malfunctioning cap from broken valve. This resulted in tar spraying over the anterior surface of his body including legs, feet, chest, abdomen, arms, and face (80% TBSA covered in tar resulting in a 50% TBSA burn injury). On presentation to the emergency department, his vest and work clothes were difficult to remove, as they were saturated with tar and hardened. As tar was evident in his oral cavity and coated on his teeth, he was intubated for airway protection, and to allow more aggressive tar removal. Tar removal began with petrolatum-based, double-antibiotic ointment, a previously reported technique for the removal of small surface area tar burns [1] (Fig. 1a and b). However, removal of the tar using the ointment took a long time and due to a limited supply, we therefore sought an alternative agent.

We did not have available agents that are suggested in the literature, such as Tween-80 or Neosporin cream [3]. Members of the burn team suggested mineral oil as an option. The most readily available supply in sufficient quantity in the hospital was in the form of mineral oil enema preparations (C.B. Fleet Company, Inc., Lynchburg, Virginia, USA). The squeezable bottle and catheter tip enabled the administration of mineral oil into the patient's construction boots and under the clothing that was adhered to his skin. This enabled the tar to be removed within 2 h of admission (Fig. 2). We found that mineral oil dissolved the tar quickly and did not result in unwanted local or systemic side effects.

The patient sustained 50% TBSA partial thickness burns and underwent split-thickness skin grafting for deep partial and full thickness areas. Nine days post-injury, the following areas were grafted: right leg (16%), right hand (1%), and left leg (2.5%). Some of his remaining burns were of deep partial thickness, and did not heal, therefore were taken for surgical excision and skin grafting at a later date. In his subsequent surgery, he was grafted to his chest/abdomen (5%) and left thigh (2%).

The chest sustained deeper burns possibly as a result of wearing the nylon reflective work vest that had melted to his clothing. The patient went on to make a full functional recovery and returned to work within 4 months of the injury (Fig. 3).

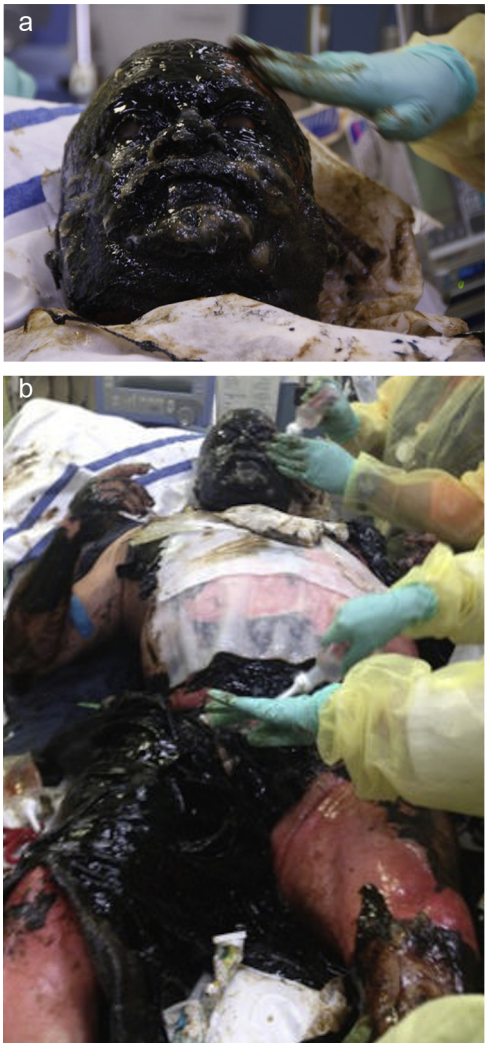

Fig. 1 – (a and b) Tar removal initially began with double antibiotic cream. However, it was slow to remove the tar, and due to a limited supply, we sought an alternative agent. Anterior surface of patient including legs, feet, chest, abdomen, arms, face and oral cavity (80% TBSA) is covered in tar.

3. Discussion

Burns caused by exposure to hot tar are a challenge to manage due to difficulty removing the substance without causing further tissue injury, impeding wound healing or risking infection [5]. Historically, various methods have used to remove tar from the skin, often based more on hospital availability than evidence alone (Table 1).

Immersion in cold water or saline and subsequent manual debridement of tar has been reported for a small tar burn [3]. However, this would not be appropriate for this case, as this may put the patient at risk of hypothermia, and is relatively ineffective.

Liquid solvents (e.g. kerosene or gasoline) are harsh and toxic to burn injured skin [3]. In addition, oily household products such as butter, sunflower oil, and mayonnaise have