

Dyspnea Associated with Henna Stone: A Rare Cause of Pediatric Tracheotomy

Case Report

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Abstract

Tracheotomy is one of the oldest surgical procedures, and it is a life-saving procedure to overcome upper airway obstructions. While congenital causes play an important role in pediatric tracheotomy indications, upper airway edema and obstruction due to anaphylaxis rarely require tracheotomy. Allergy can cause life-threatening acute edema by anaphylactic reactions in the respiratory tract. Henna stone is the material for dyeing hair with henna and making a temporary tattoo. It contains high proportions of paraphenylen-

diamine. In this study, the case of a 3-year-old boy who had accidentally drunk some henna stone solution that was prepared for hair dyeing at home and who had to undergo emergency tracheotomy because of upper airway obstruction is presented. The potential dangerous effects of this material and the importance of emergency tracheotomy as a life-saving procedure are emphasized.

Keywords: 4-phenyldiamine, dyspnea, anaphylaxis, tracheotomy

Introduction

Airway obstruction due to edema or other mechanisms can be a cause of severe respiratory distress and mortality in children whose airway is narrower than adults. This obstruction should be corrected as soon as possible, and then, treatment should be performed considering the etiology. Overcoming upper airway obstruction is possible with intubation or tracheotomy (1).

“Henna stone,” or in other words “German stone,” is not actually related to the henna plant. It is a material sold by herbalists or on the Internet with the claim of that it is a natural stone; it is also found in a grated form. In Middle East countries, it is added to natural henna to make the hair color more permanent while dyeing hair and to deepen the color and increase the permanence of a temporary tattoo.

In chemical analyses of 10 commercially available henna stones, paraphenyldiamine (PPD) was found at rates between 84.9% and 90.9% in all henna stone samples (2). PPD was

chosen as the allergen of the year by the American Contact Dermatitis Society in 2006.

In this study, a pediatric patient who had to undergo emergency tracheotomy because of the development of dyspnea as he had accidentally drunk some henna stone solution prepared for hair dyeing is presented.

Case Presentation

A 3-year-old boy was brought to the emergency unit with complaints of swollen tongue, inability to swallow, and dyspnea because he had accidentally drunk some henna stone solution that had been prepared for hair dyeing at home. His general health condition was moderate. He was conscious but showed an anxious pattern. Patient's tongue was very edematous enough to carry out the mouth, and saliva was drooling out from the edge of his mouth as he was unable to swallow. The patient displayed inspiratory stridor, suprasternal retraction, and noisy breathing. He was not cyanotic, and his blood oxygen saturation was 96% under oxygen support of 3-4 l/min (Figure 1).



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Vascular access was established with 1/3 Izomix at 50mL/h. The loading dose of 10 mg methylprednisolone was intravenously applied. Infusion began at a dose of 20 mg, and then half an ampoule of pheniramine maleate was given. At the same time, 0.5 mg adrenaline with oxygen was inhaled through a nebulizer. The National Poison Information Center was called for getting information on the henna stone, but no information was obtained.

Because the patient was not relieved by rest, his tongue was more swollen, and his dyspnea increased, an anesthesiologist was consulted. It was decided to perform emergency tracheotomy because intubation was impossible under the present condition. The patient was sedated with ketamine in the operating room, and tracheotomy was performed under local anesthesia. A portex cuffed cannula with an internal diameter of 4 mm was used (Figure 2). He was then referred to a related center due to his need for intensive care.

When the patient was seen again after 4 months, it was learned that he was treated in the intensive care unit for 10 days, he was treated for liver and renal failures, he was decannulated after 3 months, and he recovered without any problem.

Written informed consent was received from the parent of the patient for using his photos in this scientific article.



Figure 1. Patient before tracheotomy



Figure 2. Patient after tracheotomy

Discussion

In the literature, there are inadequate data on henna stone. Özkaya and Yazganoğlu (2) were the first to perform its chemical analysis, and they found PPD at rates of 84.9%-90.9% in all henna stone samples. It was suggested that henna stone was actually not a natural product obtained from some rocks, but rather a compacted form of PPD powder (4). In the literature, no data on drinking a henna stone solution are available. However, considering that PPD constitutes a major component of henna stone, a single article on three patients requiring tracheotomy for PPD toxicity was found (5).

In the study by Nevo-Shor et al. (6), a patient developing laryngeal edema, rhabdomyolysis, and acute renal failure because of accidentally swallowing a hair dye called "black rock-black henna," which was sold in local supermarkets in Israel and contained PPD, was presented. The patient was immediately taken to the operating room with an otolaryngologist team ready for performing emergency tracheotomy, was intubated by anesthetists, and then sent to the intensive care unit. In the study by Kallel et al. (7), clinical symptoms of 19 patients with PPD intoxication in Tunisia in 6 years were grouped, and they found cervicofacial edema in 79% of the patients, chocolate brown-colored urine in 74%, upper airway edema in 68.4%, oliguria in 36.8%, muscular edema in 26.3%, and shock status in 26.3%. Rhabdomyolysis and metabolic acidosis were reported in all patients. Acute renal failure and hyperkalemia were observed in 47.4% and 26.3% of the patients, respectively. Besides these, there are a number of studies demonstrating that PPD causes allergic contact dermatitis (8, 9). Moreover, following the reports on many contact dermatitis and systemic toxicity cases resulting from the exposure of the skin to henna stone, the US Food and Drug Administration has allowed its use only in hair dyes but did not approve its direct application to the skin (6).

De Groot (10) reported that when patients were sensitized to PPD, they may experience allergic contact dermatitis with the use of hair dyes containing PPD or related chemicals and that this type of reaction was frequently severe particularly in children; hospitalization was required in most of them. It was also specified that because cross-reactions to other hair dyes, dyes used in textiles, local anesthetics, and rubber chemicals might develop in most of these sensitized patients, contact with these materials had to be avoided. It was emphasized that there would be an inevitable increase in the number of patients sensitized to PPD because of the increasing use of temporary black henna tattoos and lack of legal control in the practice of henna tattooing; therefore, temporary black henna tattooing had to be controlled in the health authorities act.

Conclusion

Henna stone is not a harmless dye. It should not be sold without any control, and information on its toxic side ef-

fects should be written on its package insert. The same substance is likely to be used in temporary tattoos, which recently have been more popular among young people than permanent tattoos, in an uncontrolled manner. Moreover, "henna stone-German stone" should be matched with PPD in the National Poison Information Center database. It should be kept in mind that emergency tracheotomy is a life-saving procedure in cases where it is impossible to perform intubation for upper airway obstruction.

Informed Consent: Written informed consent was obtained from patient's parents who participated in this study.

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