International Journal of Contemporary Pediatrics
Jamir B et al. Int J Contemp Pediatr. 2019 Nov;6(6):2730-2732
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20194765

Case Report

Severe thermal injury of larynx in a child following accidental ingestion of hot tea

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Received: 12 June 2019
Revised: 01 September 2019
Accepted: 03 October 2019

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ABSTRACT

Thermal injury to the upper respiratory tract caused by aspiration of hot liquids resulting in laryngeal edema and subsequent obstruction of the airway is commonly not seen in the pediatric population. Unlike adults, children are more prone for subglottic injury, swelling and resulting obstruction of the airway due to the smaller size of the trachea and relatively large epiglottis. Examination of the airway with laryngoscopy hence should be recommended in all patients with inhalational and aspiration burn injury as it will help in guiding airway management and preventing development of complications. Authors report a case of a 3-year-old male child with accidental ingestion of just made hot tea. Upon presentation there was severe stridor and signs of respiratory distress requiring emergency intubation. Direct laryngoscopy revealed glottic edema and ulcer. Upper GI endoscopy showed erythematous arytenoids, esophagus and stomach showing few erythematous flat lesions. Chest radiographic examination showed bilateral para cardiac and perihilar inhomogeneous opacities suggestive of aspiration pneumonitis. The child was gradually weaned and extubated on day three of admission. Ingestion of hot liquids can cause airway and esophageal thermal burns. Rapid diagnosis and treatment are essential in management of inhalational and aspiration burn injury to reduce the morbidity, mortality and long-term sequelae in these patients. Children are more prone for burn accidents due to their curious and exploratory behavior and their inability to perceive the hazards. Since most of the pediatric burn accidents happen at home, parents should be offered education about prevention of burn and advised on how to manage and treat minor burn injuries and to watch for any warning signs in which case to rush to the nearest hospital.

Keywords: Burn injury, Direct laryngoscopy, Intubation, Mechanical ventilation

INTRODUCTION

Airway damage following thermal injury is associated with inhalation of steam, heat or aspiration of hot liquids.[1,2] Many incidences of burns after ingestion of hot beverages, food or objects resulting in injury to respiratory tract have been reported in adults.[2,3] In children consequences are often worse when compared to adults. The mechanism of injury is consistent with the pattern of swallowing, also affecting oral and gastrointestinal tract. Lower airway burns are unusual due to heat conduction of pharynx and swallowing reflex.[4] Vanacker et al, stresses the importance of early diagnosis of inhalation and aspiration injury, determination of anatomical extent of the injury and initiation of appropriate therapy to improve survival rates in this population.[5]

CASE REPORT

A 3-year-old boy was bought to the Emergency Department with alleged history of accidental ingestion

of just made hot tea following which he vomited immediately. But within 4 hours of ingestion he developed continuous cough, associated with drooling of blood tinged saliva and difficulty in breathing. On examination in ER at 2 am in the morning, child was very drowsy with severe respiratory distress with stridor and the oxygen saturation was merely 47% on room air. With difficult airway team at the patient's side, child was intubated and put on ventilatory support and while doing direct laryngoscopy, bloods tinged oral secretions along with epiglottitis and severe glottic edema was noted.

Chest radiographic examination showed bilateral para cardiac and perihilar inhomogeneous opacities suggestive of aspiration pneumonitis. Blood investigations were normal except for low potassium level for which correction was done.

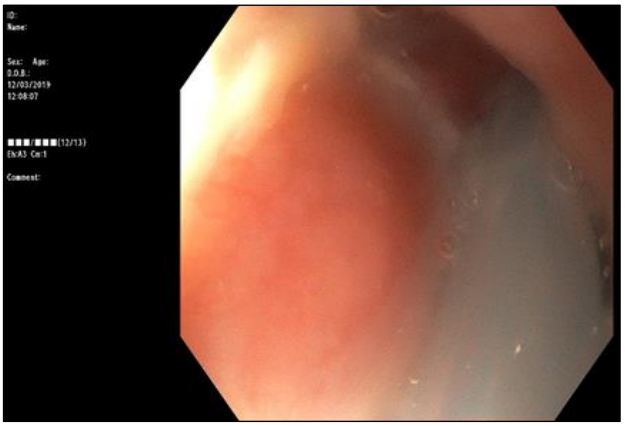

Figure 1: Hyperaemic mucosa of pharynx in endoscopy.

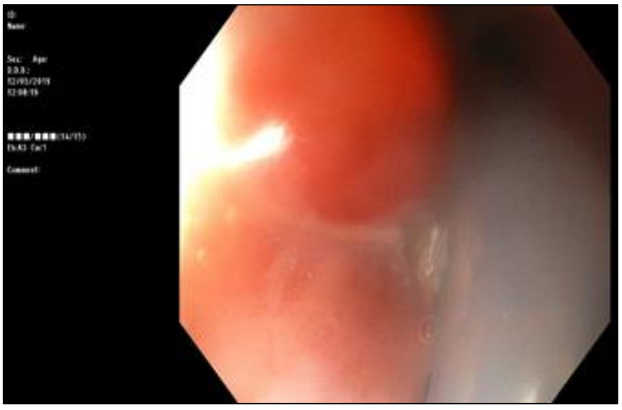

Figure 2: Erythematous arytenoids with ET tube in situ.

Upper GI Endoscopy was done on the second day of admission which showed hyperemic mucosa (Figure-1), erythematous arytenoids (Figure-2), esophagus and stomach showing erythematous lesions. The child was weaned off and extubated on the third day. Inspiratory stridor was present post extubation which was managed with injection dexamethasone, Nebulisation with epinephrine and budecort. Child was discharged on day.[4] On follow up the child is doing well with no post burn complications.

DISCUSSION

Cutaneous scald burns occurring in the bathroom or kitchen are one of the most common types of accidental burn seen during the first three years of life.[6] Airway burns though less commonly seen may be caused due to inhalation of hot dry gases or aspiration of hot liquids. Anatomically there exist three levels of airway trauma secondary to burn injury: upper airway (epiglottis and larynx), tracheobronchial and parenchymal.[7] Upper airway injury mostly occurs to the larynx .The clinical course of upper airway edema is progressive in the first hours after injury and can progress to mucosal necrosis within 12-24 hours. The hypopharynx, epiglottis and aryepiglottic fold are especially prone to edema formation because of the loose areolar tissue below thin mucosa.[8]

It is recommended that both children and adult with inhalational burn injury be observed in the acute setting for prompt treatment of any complications that may arise, mainly airway edema or obstruction, leading to respiratory distress.[9] Common signs of respiratory distress shared by both inhalation and burn injury include persistent cough, stridor, wheezing, hoarseness, blistering or edema of the oropharynx, hypoxia or hypercapnia.

The approach to upper airway burns secondary to ingestion of hot liquids is similar to inhalational injury. Airway maintenance is critical and supplemental oxygen should be provided as needed. Early intubation and IPPV may be required in cases where respiratory distress is present or anticipated. Considering that the patient's airway may have concurrent edema, it is highly recommended that the physician use less than the average safe intracuff pressure when while performing intubation on patient in need.[10] The risk for fistula formation was shown to be higher in patients on whom the usual size intracuff pressure was used. In addition to using a lower than average intracuff pressure ,the endotracheal tube should be left uncut since swelling in the 48 hours post injury may cause the end of the tube to regress into the oropharynx.[11] As such re-intubation may be required which may be unsuccessful due to massive edema of the upper airway. Regular reassessment for the need for extubation is emphasized in case of an intubated patient so as to avoid prolonged intubation and thereby avoiding dreadful complications. A study by Miller et al has shown that the use of nebulized heparin sulphate, N-acetyl cysteine and albuterol sulphate significantly improved survival in patients requiring mechanical ventilation. This improved survival was thought to be due to the following mechanisms of actions: the inhibition of airway clot formation by heparin, mucolytic achieved by N-acetyl cysteine and bronchodilation subsequent to albuterol administration. The effects of these drugs lead to a

decrease in the time spent by the patient on mechanical ventilation, in addition to a reduction in morbidity and mortality, and the cost of medical care.[12] It is recommended that tracheostomy be reserved for patients who cannot be endotracheally intubated or who fail extubation.[13]

CONCLUSION

In children burns are a major cause of morbidity and mortality. Children are more prone for burn accidents due to their curious and exploratory behaviour and their inability to perceive the hazards. Since most of these burn injuries occur at home and can be prevented the parents or guardian should be educated and made aware of the simple preventive measures to eliminate paediatric burn accidents. Spreading awareness of paediatric burns and its prevention can also be done through various means of communication like social media and print media so that the parent/guardian and child can be educated and made aware on how to reduce and prevent burn hazards.

ACKNOWLEDGEMENTS

Authors would like to thank to Dr Lokesh C R (Dept. of Gastroenterology) Columbia Asia Hospital, Whitefield, Bangalore, Karnataka, India for his assistance.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Jamir B, Kumar SSP, Azam NMD, Kumar A, Patnayak P. Severe thermal injury of larynx in a child following accidental ingestion of hot tea. Int J Contemp Pediatr 2019;6:2730-2.