

## Case Report

# An adult case of laryngopharyngeal burn by drinking hot water

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**Case:** A 61-year-old man who was hospitalized with schizophrenia in a psychiatric hospital drank hot water estimated to be 90°C. Eight hours after injury, laryngopharynx edema gradually progressed, and his breathing deteriorated. Upon arrival at our emergency room, we secured his respiratory tract by nasal intubation under a bronchoscope.

**Outcome:** The edema gradually improved after peaking at hospital day 2, and he was extubated on hospital day 18. There were no apparent respiratory or esophageal problems, and he was discharged back to the psychiatric hospital on day 28.

**Conclusion:** These types of laryngopharynx burns caused by ingesting hot foods or drinks have been rarely reported for adults. In cases of adults, when the patient is in a special situation such as having a psychiatric disorder, it is necessary to assume that the laryngopharynx burns might be aggravated.

**Key words:** Adult, airway management, edema, laryngopharynx

## INTRODUCTION

INTRAOURAL AND LARYNGOPHARYNX (ILP) thermal burn injuries caused by accidentally swallowing hot beverages generally occur in infants; it is extremely rare in adults and few adult cases have been reported.<sup>1</sup> Although these types of burns to the ILP area usually result in minor injuries, some cases can be much more serious and require airway management. Here we report an adult case of a severe laryngopharynx burn associated with drinking hot water which required airway management.

## CASE

A 61-YEAR-OLD MAN, who had been hospitalized for schizophrenia at a psychiatric hospital, drank hot water from a hot water supply device (setting at 90°C) at approximately 01:00 AM. Intraoral edema gradually progressed, and his breathing condition deteriorated. The psychiatrist made a

telephone call to our hospital for a hospital transfer request at 09:00 AM, 8 h after the injury. We judged that it was a respiratory tract emergency and traveled to the psychiatric hospital by rapid response car. On arrival we were able to maintain his SpO<sub>2</sub> at ≥90% by bag valve mask ventilation and intraoral suction, and he was taken to our hospital by ambulance.

On arrival at our emergency room, the patient was drooling and wheezing. His SpO<sub>2</sub> was approximately 80% by bag valve mask ventilation, and his Glasgow Coma Scale score was E3V1M5. Because the urgent airway management was necessary, we took into account a cricothyroidotomy. While preparing for the cricothyroidotomy, we first tried nasal intubation under a bronchoscope and succeeded at intubation; therefore, cricothyroidotomy was not required. The patient's lips were extremely edematous at the time of intubation (Fig. 1).

When we evaluated the intraoral area using a bronchoscope, we could see that it was erythrogenic with a swollen epiglottis (Fig. 2A). There was an extremely narrow space around the tube in the ILP area because of the swelling (Fig. 2A, B).

The edema gradually worsened and peaked approximately 20 h after the injury (Fig. 1B). As the edema gradually improved during ventilator management (Fig. 1C), the patient was ready to be extubated on hospital day 11, based

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**Fig. 1.** Swelling of lips and tongue in a 61-year-old man with schizophrenia who drank hot water estimated to be 90°C. Photographs were taken immediately after intubation (A), 20 h after the injury (B), and 6 days after the injury (C).

on the existence of cuff-leak and no ILP edema from endoscopic findings. However, he developed pneumonia during ventilator management; therefore, the extubation was postponed until respiratory function had recovered. He was eventually extubated on hospital day 18. In addition, we used methylprednisolone before the extubation for the prophylaxis of postextubation stridor. He was discharged back to the psychiatric hospital on hospital day 28 and had no respiratory or esophageal problems clinically at that time. He still had no swallowing dysfunction 20 months later.

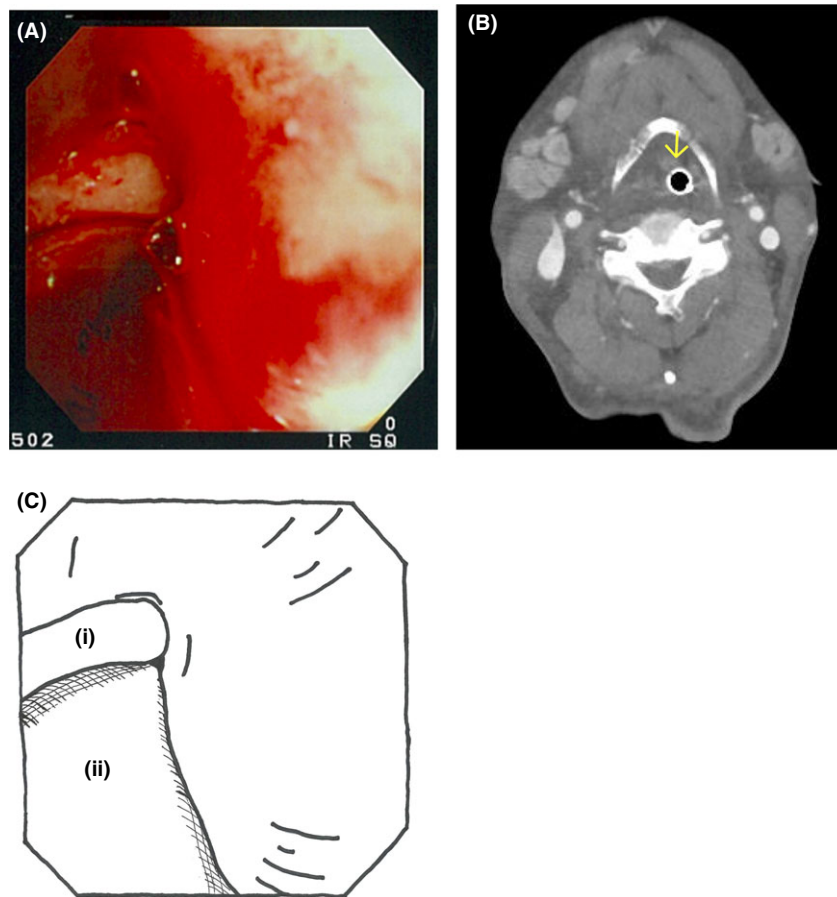
## DISCUSSION

**WE EXPERIENCED** A rare case of an adult severe thermal ILP burn injury, which needed airway management. Burn injuries to the ILP area caused by hot foods or drinks are mainly seen in infants, and adult cases are extremely rare with few reports published (Table 1).<sup>1–8</sup> Adult cases are not usually severe because it is impossible to

ingest food and drink that are at a high temperature. Injuries are mild in most adult cases and can be medically treated without any sequelae.<sup>8</sup> However, when injuries are severe, there is a risk of respiratory tract emergency and esophageal stenosis.

In cases of laryngeal burn injuries, laryngeal edema usually peaks within 6–24 h after the injury and then gradually improves.<sup>9</sup> In this case, our first contact with the patient was 8 h after the injury when laryngeal edema was obvious and airway management was necessary. His edema peaked 20 h after the injury (Fig. 1B), similar to that in a previous report.<sup>9</sup>

In addition, esophageal cicatricial strictures after thermal burns are rare.<sup>7</sup> In this case, the patient had no clinical problem in the esophagus. The reasons why he did not have esophageal cicatricial stricture might be that the volume of hot beverages consumed was smaller compared to the case with esophageal stenosis, or he might have kept hot water in his mouth for a considerably long time to try and swallow but eventually ejected it.



**Fig. 2.** Pictures after the nasal intubation of a 61-year-old man with schizophrenia who drank hot water estimated to be 90°C. A, The larynx as observed using a bronchoscope immediately after intubation. B, Computed tomography of the larynx area, showing the intubation tube (yellow arrow). C, Schema of photograph A illustrating the swollen epiglottis (i) and the intubation tube (ii).

**Table 1.** Published reports of adult cases of intraoral and laryngopharynx burn injuries caused by hot foods or drinks

Age, years	Sex	Hot food or drink	Intubation	Treatment	Year	Reference no.
28	Female	Coffee	(+)	Tracheostomy	1977	2
29	Male	Treacle tart heated by microwave oven	(-)	Intravenous steroids	1994	3
21	Male	Potato heated by microwave oven	(-)	Intravenous steroids	1995	4
51	Male	Stewed tomato	(-)	Intravenous steroids	1996	5
59	Male	Milk that had been in boiling water	(-)	Intravenous steroids	2002	1
43	Male	Water	(-)	Intravenous steroids	2008	6
79	Male	Lasagna heated by microwave oven	(-)	Intravenous steroids	2013	7
28	Male	Coffee	(+)	Tracheostomy	2013	8

In this case, we did not use steroids for the treatment of ILP thermal burn injury. There are some reports<sup>1,3–7</sup> of cases treated with steroids, as observed in the case of acute epiglottitis. However, there is no definite evidence for laryngeal thermal burns; moreover, a standard treatment for adult laryngeal burns has

not yet been established. It is controversial that laryngeal burns are traditionally treated with antibiotics and steroids.<sup>1</sup> Further studies are warranted for the treatment of ILP thermal burns.

In most adult cases, injuries are relatively mild, airway management is unnecessary, and medical treatment includes

the use of steroids (Table 1). Cases that required surgical airway management were thought to have occurred due to swallowing a large quantity of food or drink before realizing that it was hot. We found only two published cases that required a tracheostomy (Table 1). Reference case #2 had a psychiatric disorder similar to our case. Reference case #8 drank a gulp of hot coffee in a punishment game.

In our case, the patient originally had water intoxication because of schizophrenia, and he might have actively drunk the hot water, causing the severe burn injuries. Thus, even in an adult case, when the patient has a psychiatric disorder as an underlying disease or is in a special situation, it is necessary to assume that an intraoral and/or laryngopharynx burn caused by hot foods or drinks might be aggravated.

### CONFLICT OF INTEREST

**N**ONE.

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