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## A case of cricothyroidotomy for facial trauma in a patient taking antiplatelet agents after a simple ground-level fall

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## ABSTRACT

**INTRODUCTION:** Cricothyroidotomy is an emergency procedure that can be used to secure the airway in situations in which intubation and ventilation are not possible.

**PRESENTATION OF CASE:** We describe a case of 79-year-old male presenting with facial trauma combined with massive upper airway bleeding and swelling in which cricothyroidotomy was required to open the airway in an elderly male patient taking antiplatelet agents who suffered a simple ground-level fall.

**DISCUSSION:** Although emergency airway management is often required in patients with Le Fort fractures, mandibular condyle fractures exhibit a significant relationship with ground-level falls, which are not usually associated with emergency airway management. Prophylactic intubation should be considered prior to transfer or deterioration in a trauma patient with dual antiplatelet drugs and fractures of bilateral mandibular condyle.

**CONCLUSION:** Clinicians should be aware of the life-threatening injuries that can be caused by simple ground-level falls in patients taking antiplatelet agents.

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### 1. Introduction

Cricothyroidotomy is a life-saving procedure that is performed when a physician cannot intubate or oxygenate a patient [1]. On the other hand, elderly patients are at high risk of intracranial fall-related injuries, and oral anticoagulants are associated with high mortality and morbidity [2–4]. We herein report an extremely rare case of simple ground-level fall-related facial trauma in which the patient required cricothyroidotomy.

### 2. Presentation of case

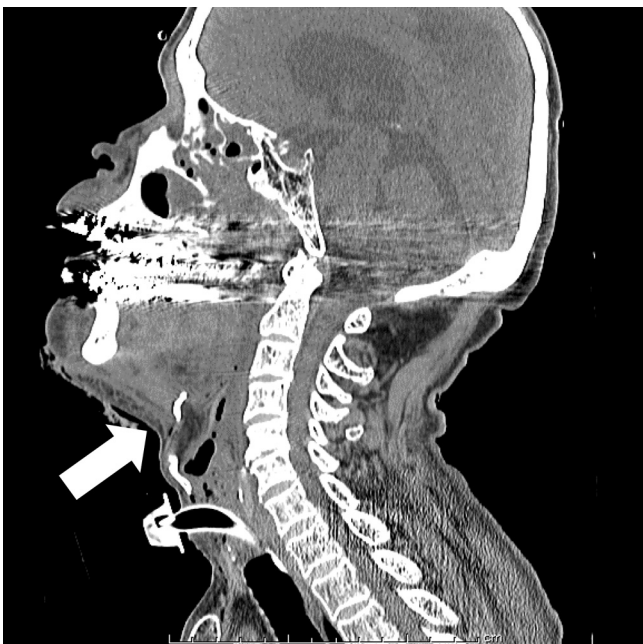
A 79-year-old male with bilateral mandibular condyle fractures was transferred from another hospital three hours after suffering a ground-level fall while taking his dog for a walk. His medical history included a myocardial infarction, and he was taking two antiplatelet agents, 100 mg of aspirin and 75 mg of clopidogrel.

On arrival at the other hospital, oral bleeding and swelling of the tongue were noted, but neither of these had resulted in significant upper airway obstruction. However, the patency of his airway had deteriorated while he was transported to our tertiary hospital, which took an hour.

On arrival at our hospital, the patient was groaning in a manner that was suggestive of upper airway obstruction. In addition, he presented with a laceration on the lower jaw and massive oral bleeding of unknown origin. His vital signs were as follows: Glasgow Coma Scale: 12 (E4V2M6), respiratory rate: 22 breaths/min, pulse rate: 80 beats/min, blood pressure: 158/67 mmHg, and oxygen saturation: 94% on 2L/min of oxygen. Since he exhibited signs of upper airway obstruction, awake tracheal intubation was attempted once to secure the airway, but it was impossible due to massive oral bleeding and significant swelling of the tongue and upper airway. Hence, we decided to perform cricothyroidotomy fifteen minutes after the patient's arrival. After inducing local anesthesia, a transverse incision was made in the skin and cricothyroid membrane, and a curved hemostat was guided into the trachea so that communication with the trachea was never lost. Ultimately, a tracheal tube with an internal diameter of 7.0 mm was successfully and uneventfully installed. The patient's oxygen saturation recovered from 84% to 100% soon after the procedure.

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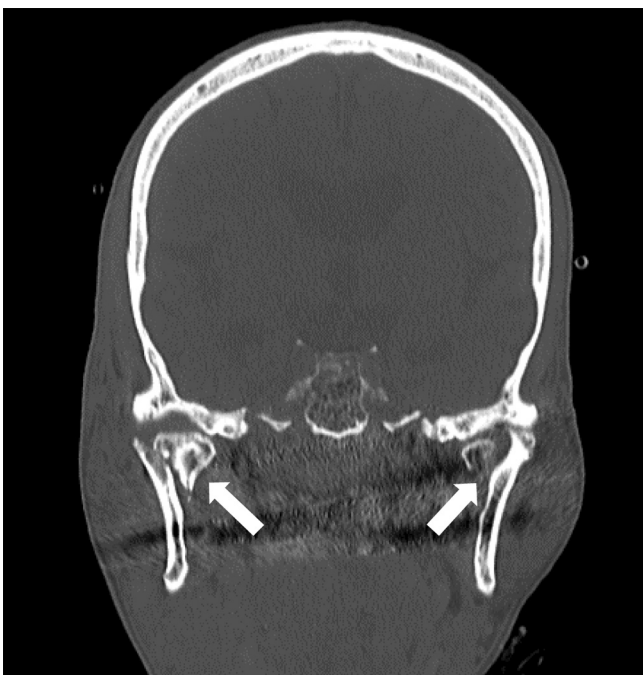
**Fig. 1.** Sagittal computed tomography scan of the facial region obtained at the time of admission. Significant swelling of the oropharyngeal region including the tongue, which resulted in upper airway obstruction (white arrow), was seen.

The initial computed tomography scan detected significant oropharyngeal edema (Fig. 1). No further mandibular fractures or traumatic intracranial hemorrhaging were observed (Fig. 2). The cricothyroidotomy was converted to tracheostomy on the day of admission due to massive edema around the oropharyngeal region. The lacerations of the lower jaw and the base of the tongue were repaired, and intraoral traction with the elastics was performed (Fig. 3).

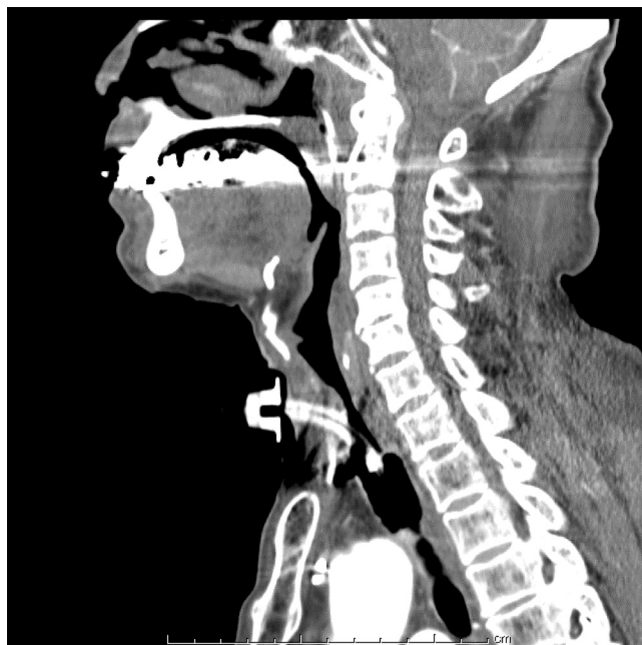


**Fig. 3.** An image of the patient taken 8 h after the injury (when the cricothyroidotomy was converted to tracheostomy). Massive bruising, a hematoma of the lower jaw, and significant swelling around the neck are shown.

The tracheal tube was removed on day 7 after making sure that the oropharyngeal edema had been resolved (Fig. 4). The intermaxillary fixation was performed from day 4 to day 17. After undergoing mouth opening training, the patient was discharged on day 29 without any complications associated with the cricothyroidotomy. Fig. 5 shows an image of the patient obtained at discharge.



**Fig. 2.** Coronal computed tomography scan of the facial region obtained at the time of admission. Fractures of the bilateral mandibular condyle (white arrows) were noted.



**Fig. 4.** Sagittal computed tomography scan of the facial region obtained 6 days after the injury. The swelling of the oropharyngeal region, including the tongue, had improved.



Fig. 5. An image of the patient obtained at the time of discharge.

### 3. Discussion

Cricothyroidotomy is a life-saving procedure which is required when a physician cannot intubate and cannot oxygenate a patient. The indication for cricothyroidotomy includes excessive blood in the mouth or nose, massive facial trauma, or airway obstruction resulting from angioedema, trauma, burns, or a foreign body obstructing airway [1]. Chang et al. reported that clinical conditions required for cricothyroidotomy were facial fractures (32%), blood or vomitus in the airway (32%), traumatic airway obstruction (7%), and failed intubation in the absence of other specified problems (11%) [5]. In level I trauma center, the patients required cricothyroidotomy were associated with high energy injury, whose mean Injury Severity Score was 29 [6].

Elderly patients are at high risk of intracranial fall-related injuries [2]. Even though traumatic brain injuries are the most common type of injury associated with falls in elderly patients (regardless of whether the fall occurs at ground level or higher), it was reported that facial fractures only account for 6% of fall-related injuries [7]. In addition, elderly patients that are receiving oral anticoagulants, but not antiplatelet medications, are at great risk for mortality after a fall [3,4]; however, no data have been reported about the impact of anticoagulant or antiplatelet drugs on facial trauma.

Emergency airway management is often required in patients with Le Fort fractures [8]. On the other hand, mandibular condyle fractures exhibit a significant relationship with ground-level falls, which are not usually associated with emergency airway management [9]. In the present case, the airway was patent at first; however, oropharyngeal edema developed while the patient was transferred to our hospital (3 h after the injury). The fact that the patient was taking two antiplatelet agents could have contributed to the massive bleeding and oropharyngeal edema he suffered, which in turn resulted in airway obstruction. Prophylactic intubation should be considered prior to transfer in a trauma patient with dual antiplatelet drugs and fractures of bilateral mandibular condyle.

### 4. Conclusion

We described an extremely rare case of ground-level fall-related facial trauma in which the patient required cricothyroidotomy. Clinicians should be aware of the life-threatening injuries that can be caused by simple ground-level falls in patients taking antiplatelet agents.

### Conflicts of interest

All authors state that they have no conflicts of interest.

### Funding

All authors have no source of funding.

### Ethical approval

No ethical approval needed.

### Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

### Authors' contributions

TY, TM, KT and KS took care of the patient. TY and TM wrote the report. KS, TU and YU evaluated the draft and suggested revisions. All authors have read and approved the final manuscript.

### Guarantor

Tetsuya Yumoto.

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