Abstract
Retropharyngeal hematoma is a rare and life-threatening due to the rapid progression of airway obstruction. We herein report a case of exacerbation of retropharyngeal hematoma after initial improvement.

We report the case of a 93-year-old woman who presented to the emergency department complaining of anterior neck swelling. She was diagnosed as retropharyngeal hematoma without a preceding traumatic injury or coagulopathy. Computed tomography (CT) scan showed a hematoma extending from the retropharyngeal to the superior mediastinal space and slight extravasation near the right vertebral artery. She was conservatively managed at the intensive care unit, with improvement in neck size. On post-admission day 21, she suddenly developed dysphagia followed by dyspnea, her oxygen saturation decreased rapidly, and emergency tracheostomy was performed. A CT scan revealed exacerbation of the retropharyngeal hematoma. Twelve days after exacerbation, she moved to the general ward because her condition became stable. On post-admission day 60, she developed bacterial pneumonia, which worsened her respiratory condition. On post-admission day 80, she died of bacterial pneumonia.

On encountering elderly patients with retropharyngeal hematoma-associated airway obstruction without preceding traumatic injury or coagulopathy, airway management and monitoring for hemorrhage are essential.

Key words: retropharyngeal hematoma, difficult airway, airway obstruction

Introduction
Retropharyngeal hematoma is a rare and life-threatening due to the rapid progression of airway obstruction. Retropharyngeal hematoma without preceding traumatic injury or coagulopathy is rare. In the present case, there was neither a preceding traumatic injury nor a coagulopathy. In addition, retropharyngeal hematoma improved with conservative therapy; however, the patient later experienced an exacerbation of the retropharyngeal hematoma. To the best of our knowledge, this is the first case reported wherein there was an exacerbation of retropharyngeal hematoma after it had initially improved.

Case report
A 93-year-old woman presented to the emergency department with a 5-hour history of a rapidly worsening of anterior neck swelling. She had no history of a preceding traumatic injury and was not on any medication. On arrival, she was conscious and alert and had a blood pressure of 171/103 mm Hg, heart rate of 62 beats/min, temperature of 37.0°C, peripheral oxygen saturation of 98% at ambient air, and respiratory rate of 22 breaths/min. Physical examination did not reveal any abnormal findings except for the anterior neck swelling and bruising. There was no stridor, but her voice was hoarse. Laborato-
ry tests showed an activated partial thromboplastin time of 34.8 sec, prothrombin time of 15.7 sec, international normalized ratio of 1.36, hemoglobin level of 10.0 g/dL, and platelet count of $7.3 \times 10^4 / \mu L$. Her liver and renal function test results were within normal limits. Contrast-enhanced computed tomography (CT) scan of the neck showed a hematoma extending from the retropharyngeal to the superior mediastinal space and slight extravasation near the right vertebral artery, but no evidence of vertebral fracture or active bleeding (Fig. 1).

Endoscopic examination revealed a bulge in the posterior pharyngeal wall with reddish discoloration and normal anatomy of the esophagus. The glottis space was narrow but adequate for breathing (Fig. 2).

Fig. 1 Computed tomography with contrast medium. A: Sagittal image showing retropharyngeal hematoma (arrow). B: Coronal image showing slight extravasation near the right vertebral artery (arrow).

Fig. 2 Endoscopic images. A: Image of the pharynx showing a bulge in the posterior pharyngeal wall with reddish discoloration and a narrow glottis space. B: Image of the esophagus showing normal anatomy.
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She was admitted to the intensive care unit (ICU) to receive conservative therapy which involved oxygen administration and intravenous nutrition because of sufficient airway function. She was not allowed to ingest anything by mouth. On post-admission day 2, a follow-up CT scan showed no exacerbation of the retropharyngeal hematoma, and her symptoms had improved. Over 2 weeks, her neck size decreased, and CT revealed that the retropharyngeal hematoma had diminished in size. On post-admission day 21, she suddenly developed dysphagia; a few hours later, she began to experience difficulty in breathing with extreme stridor, and her oxygen saturation decreased rapidly. Endotracheal intubation was attempted but failed due to the inability to visualize the airway secondary to displacement of the pharynx and larynx; thus, surgical tracheostomy was performed. After tracheostomy, her respiratory condition became stable. CT after tracheostomy revealed exacerbation of the retropharyngeal hematoma, which was compressing the airway (Fig. 3).

Five days after exacerbation we attempted insertion of a nasogastric feeding tube, but we were unsuccessful owing to swelling of the posterior pharyngeal wall. Ten days after exacerbation, the hematoma ruptured, releasing approximately 800 mL of blood through her mouth. Hemostasis was immediately achieved, and a nasogastric feeding tube was subsequently inserted. Twelve days after exacerbation she moved to a general ward because her condition became stable. Over the next 1 month, she experienced no changes. However, sputum excretion continued through the tracheostomy tube. On post-admission day 60, she developed bacterial pneumonia which manifested as shortness of breath and fever. Intravenous antibiotic therapy with 4.5 mg of piperacillin/tazobactam every 8 hours was started, but her respiratory condition worsened. On post-admission day 80, she died of bacterial pneumonia.

Discussion

Retropharyngeal hematoma is rare and life-threatening due to the rapid progression of airway obstruction. The retropharyngeal space is located posterior to the buccopharyngeal fascia surrounding the pharynx and anterior to the prevertebral fascia of the cervical and thoracic spine, and it extends laterally to the carotid sheaths. It begins at the base of the skull and terminates in the superior mediastinum. Bleeding into the retropharyngeal space is a serious condition leading to formation of a massive hematoma and airway obstruction secondary to dislocation of the pharynx and larynx. There are various causes of retropharyngeal hematoma such as traumatic, iatrogenic and spontaneous causes. Traumatic causes involve cervical vertebral fracture, vascular injury, foreign body ingestion, whiplash, sneezing, and coughing. Iatrogenic causes involve cardiac catheterization, cerebral angiography, jugular vein cannulation, stellate ganglion block, and coagulopathy with anticoagulation therapy. Spontaneous cause is defined by the absence of any clear etiology.

Symptoms of retropharyngeal hematoma include sore throat, hoarseness, dysphagia, odynophagia, dyspnea, and stridor. Patients classically present with Capp's triad, which consists of airway compression, displacement of the trachea anteriorly, and bruising of the neck and chest. In the present case, symptoms on arrival included throat discomfort, hoarseness, and anterior neck swelling and bruising. However, on exacerbation of retropharyngeal hematoma, she manifested dysphagia, dyspnea, and extreme stridor.

Imaging examinations may provide effective clues for diagnosis of retropharyngeal hematoma. For ex-
ample, lateral radiography of the neck may show a marked widening of the prevertebral space. Moreover, multi-detector computed tomography (MDCT) angiography can display the anatomical location of the source of hemorrhage. Magnetic resonance imaging can clearly display the anatomy with a soft-tissue contrast and identify acute and subacute blood products. Catheter angiography can detect vascular injury accurately. On the other hand, catheter angiography carries a risk of stroke of approximately 1%. Accordingly, MDCT angiography has become widely used as a diagnostic procedure for vascular injury. If needed, catheter angiography should be performed after MDCT angiography. In the present case, MDCT angiography revealed that there was no active bleeding, but there was a slight extravasation near the right vertebral artery. Upon these results, catheter angiography should typically be performed to detect the source of extravasation. If vascular injury is detected, endovascular treatment should be conducted to control bleeding and prevent exacerbation of retropharyngeal hematoma.

If there is any evidence of airway obstruction, the aim of management of the respiratory condition is to secure the airway. In case of retropharyngeal hematoma-induced airway obstruction, endotracheal intubation is difficult owing to an inability to visualize the airway; this is secondary to displacement of the pharynx and larynx. In addition, endotracheal intubation is associated with the risk of hematoma rupture or increased bleeding. On the other hand, fiberoptic intubation, cricothyroidotomy, and tracheostomy are strongly recommended to secure the difficult airway. In the present case, on arrival, there was no evidence of airway obstruction in the CT and endoscopic examination. Accordingly, she was admitted to the intensive care unit with conservative therapy. However, after exacerbation of the retropharyngeal hematoma, endotracheal intubation did not allow direct visualization of the airway due to displacement of the pharynx and larynx. Cricothyroidotomy was not attempted due to a lack of anatomical landmarks secondary to anterior neck swelling. Therefore, tracheostomy was the only procedure available to secure the airway.

Retropharyngeal hematoma may require conservative management if the airway is secured, although it could take a few weeks for the hematoma to spontaneously resolve. Surgical repair may be considered only if the hematoma is rapidly expanding, impeding mechanical ventilation, or failing to resolve. Although surgical intervention may lead to earlier extubation and recovery, it carries an increased risk of infection. On the other hand, endovascular embolization could be an alternative treatment to control bleeding. In particular, the vertebral artery is difficult to access surgically; therefore, endovascular embolization might be a more appropriate procedure.

In the present case, the patient had retropharyngeal hematoma without a preceding traumatic injury or coagulopathy. Although catheter angiography was not performed due to her age, any evident cause of retropharyngeal hematoma could not be detected in other examinations. On the other hand, CT showed calcification of the aortic arch and cervical artery, indicating arteriosclerosis. Arteriosclerosis is a thickening, hardening, and loss of elasticity of the vessel walls that is associated with vessel wall fragility. Therefore, we assumed that arteriosclerosis and aging led to vessel wall fragility and that this triggered the bleeding and led to retropharyngeal hematoma. This is consistent with reports that elderly individuals experience retropharyngeal hematoma with minor trauma. Additionally, older patients with fragile blood vessels may require long-term follow-up.

Conflict of interest: None.

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