

A 92-year-old man with retropharyngeal hematoma caused by an injury of the anterior longitudinal ligament

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【Abstract】 Traumatic retropharyngeal hematoma is a rare condition and may be lethal in some cases. In patients with this condition, the absence of a vertebral fracture or a major vascular injury is extremely rare. We present the case of a 92-year-old man who hit his forehead by slipping on the floor in his house. He had no symptoms at the time; however, he experienced throat pain and dyspnea at 6 hours after the injury. On arrival, he complained of severe dyspnea; therefore, an emergency endotracheal intubation was performed. A lateral neck roentgenogram after intubation showed dilatation of the retropharyngeal and retrotracheal space and no evidence of a cervical vertebral fracture. Cervical computed tomography (CT) with contrast medium revealed a massive hematoma extending from the

retropharyngeal to the superior mediastinal space but no evidence of contrast medium extravasation or a vertebral fracture. However, sagittal magnetic resonance imaging (MRI) revealed an anterior longitudinal ligament (C₄₋₅ levels) injury. We determined that the cause of the hematoma was an anterior longitudinal ligament injury and a minor vascular injury around the injured ligament. Therefore, we recommend that patients with retropharyngeal hematoma undergo sagittal cervical MRI when roentgenography and CT reveal no evidence of injury.

Key words: *Hematoma; Longitudinal ligaments; Cervical vertebrae; Magnetic resonance imaging*

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Traumatic retropharyngeal hematoma is a rare condition and may be lethal in some cases. Majority of the patients with this condition have major injuries such as vertebral fractures, and the absence of a vertebral fracture or major vascular injury in patients with this condition is extremely rare.¹⁻⁵ We present the case of a patient with life-threatening retropharyngeal hematoma wherein no major injuries were detected on a roentgenogram or computed tomography (CT) scan. However, magnetic resonance imaging (MRI) revealed an anterior longitudinal ligament (C₄₋₅ levels) injury. We believe that the cause of hematoma is an anterior longitudinal ligament injury and a minor vascular injury around the injured ligament. Therefore, we recommend that this patient undergo cervical MRI when roentgenography or CT reveals no evidence of injury.

CASE REPORT

A 92-year-old man hit his forehead by slipping on the floor of his house. At the time, he showed no symptoms; however, he experienced throat pain and dyspnea at 6 hours after the injury. Therefore, he was admitted to his family doctor's clinic by his family members. At the clinic, he complained of throat pain, dyspnea, and neck pain and had no neurological dysfunction. The patient had an old cerebral infarction for which he was receiving an antiplatelet agent. A lateral neck roentgenogram obtained at the clinic (Figure 1a) showed dilatation of the retropharyngeal space but no evidence of a cervical vertebral fracture. His dyspnea worsened, and hence he was transferred to our hospital in an ambulance. On arrival, he was conscious and alert, and his vital signs were as follows: systolic blood pressure, 120 mm Hg; respiratory rate, 24 breaths/min; heart rate, 108 beats/min; and SpO₂, 94% under 10 L O₂/min. He complained of severe dyspnea; hence, emergency endotracheal intubation was performed. A lateral neck roentgenogram obtained after intubation (Figure 1B) showed dilatation of the retropharyngeal and retrotracheal space but no evidence of a cervical vertebral fracture. Cervicothoracic CT with contrast medium revealed a massive hematoma extend-

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ing from the retropharyngeal to the superior mediastinal space but no evidence of contrast medium extravasation or a vertebral fracture (Figures 2A,B). The cause of hematoma was not identified on performing CT angiography and reconstructive sagittal CT (Figures 2C,D); hence, MRI was performed. Sagittal MRI (T2-weighted) revealed tearing of the anterior longitudinal ligament (C₄₋₅ levels, Figure 3). We found that ligament injury and a minor vascular injury around the injured ligament was the cause of the massive hematoma.



Figure 1. **A:** Lateral neck roentgenogram obtained at the clinic revealed dilatation of the retropharyngeal space and showed no evidence of a cervical vertebral fracture. **B:** Lateral neck roentgenogram obtained at our hospital after intubation revealed dilatation of the retropharyngeal and retrotracheal space and showed no evidence of a cervical vertebral fracture.

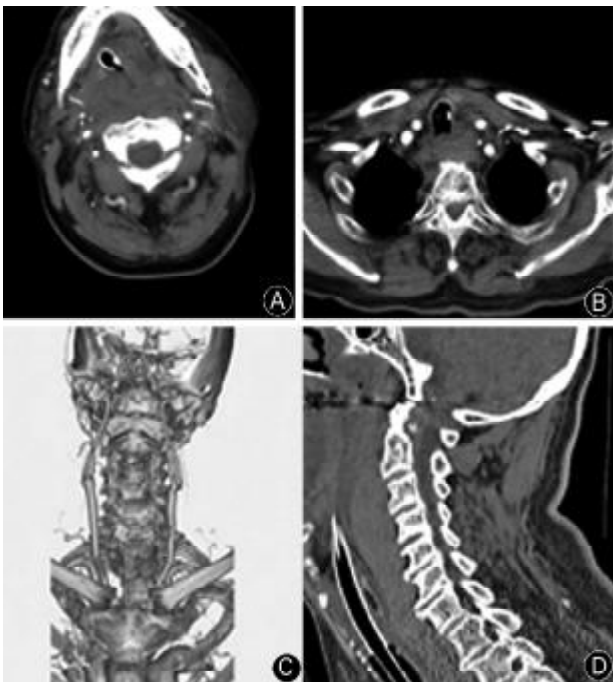


Figure 2. **A, B:** Cervicothoracic CT with contrast medium (axial imaging) revealed a massive hematoma extending from the retropharyngeal to the superior mediastinal space and showed no evidence of contrast medium extravasation or a vertebral fracture. **C:** CT angiography revealed no major vascular injury. **D:** Reconstructive sagittal CT revealed a massive retropharyngeal hematoma and no evidence of a vertebral fracture.



Figure 3. Cervical MRI (T2-weighted sagittal imaging). The white arrow shows tearing of the anterior longitudinal ligament between the C₄ and C₅ levels.

After admission, administration of the antiplatelet agent was discontinued. On the 10th day after admission, the patient was extubated as the retropharyngeal hematoma decreased in size. Although we recommended surgical fixation of the cervical vertebrae, the patient and his family did not consent to an operation because of the patient's old age. Therefore, he was made to wear a neck collar and was discharged on the 14th day of hospitalization; the patient had no medical complications at the time of discharge.

DISCUSSION

Retropharyngeal hematoma is a rare condition and may be lethal in some cases. A massive hematoma in the retropharyngeal space may lead to an anatomic obstruction of the upper airway. There are various causes of retropharyngeal hematoma: traumatic causes such as a cervical vertebral fracture, whiplash, and iatrogenic or vascular injury and non-traumatic causes such as spontaneous coughing, carcinoma, and aortic disease.¹⁻¹² In the majority of the cases, traumatic retropharyngeal hematoma occurs after a cervical vertebral fracture. Therefore, in such cases, dilatation of the retropharyngeal space on a lateral neck roentgenogram is indicative of a cervical vertebral fracture. However, in some traumatic retropharyngeal hematoma reports, cervical vertebral fractures and other major vascular injuries were not revealed. Mechanism of traumatic retropharyngeal hematoma with no evidence of vertebral fracture is still unclear and controversial.³⁻⁵ Most verified hypotheses implicate tearing of the longus colli muscles along the vertebral bodies due to hyperextension.

Another hypothesis implicates the avulsion of the muscle and vertebral branches of the vertebral artery due to sustenance of shear forces.^{2,3,4,6} On the other hand, few studies have reported that the cause of hematoma was a result of the tearing of the anterior longitudinal ligament.^{2,13,14} Kelly and co-workers¹³ reported the usefulness of diagnosing anterior longitudinal ligament injuries by MRI. In a previous report, Silberstein M and co-workers¹⁴ conducted a retrospective analysis of 27 patients with cervical spine injury who had undergone MRI; they found that 14 patients had prevertebral soft tissue swelling on the basis of initial lateral radiographs, and of these, 13 had anterior longitudinal ligament disruption as revealed by MRI.

Because of recent advances in radiological technology, we are able to obtain a detailed diagnosis. MRI is especially useful and is widely used in various fields such as oncology, neurology, cardiology, and orthopedics. In our present case, we were unable to detect the cause of hematoma on the basis of a roentgenogram and CT scan; however, MRI revealed an injury of the anterior longitudinal ligament. We believed that our patient injured the anterior longitudinal ligament after a hyperextension injury caused by hitting his forehead; further, he was probably bleeding at the anterior longitudinal ligament and the minor vascular injury around the injured ligament. There were 2 observations that led to our hypothesis. One was the tearing of the anterior longitudinal ligament (C₄₋₅ levels), revealed by sagittal MRI, without evidence of any other injury. The other was that most expanding hematoma was observed around the ligament where the injury was sustained. In addition, we thought that the causes of the expanding hematoma were old age and the administration of antiplatelet agent. The muscle tissue and other tissues become weak with age; this interferes with hemostasis and hampers effective tamponade. Further, the antiplatelet agent is a risk factor for traumatic bleeding, and it is difficult to spontaneously achieve hemostasis.

Without performing MRI, we would not have been able to arrive at an accurate diagnosis. We may have diagnosed the condition as a massive retropharyngeal hematoma without evidence of a vertebral fracture or other major vascular injuries. In most of the reported literature, evaluation has been based on roentgenography and CT. Naturally, we thought that there could be various causes for a traumatic retropharyngeal hematoma that is unaccompanied by any evidence of injury. However, anterior longitudinal ligament might be

found injured if patients were evaluated by sagittal cervical MRI. Therefore, we recommend that the patient with retropharyngeal hematoma undergo sagittal cervical MRI when roentgenography and CT reveal no evidence of a vertebral fracture.

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