

Clinical reports

Acute airway obstruction secondary to retropharyngeal hematoma

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Introduction

It is known that retropharyngeal hematoma, which is formed in the space between the pharynx and the vertebral column, can cause severe airway obstruction. We report a case of a 40-year-old man with a massive retropharyngeal hematoma following blunt neck trauma. Emergent airway management must be considered for upper airway obstruction due to retropharyngeal hematoma.

Case report

A 40-year-old healthy man, 175 cm in height and 90 kg in weight, was involved in a skiing accident in which he received a strong blow to his neck. Afterward, he felt slight discomfort in his neck. About 6 h later, he presented mild dyspnea and went to the nearest general hospital. Vital signs were normal, but a chest X-ray presented marked widening of the mediastinum. Emergent computed tomography (CT) scan revealed severe tracheal stenosis due to a massive retropharyngeal hematoma that extended from the level of the pharynx down to that of the bifurcation of trachea. The trachea was stenosed quite severely at the level of the sternoclavicular joint and displaced anteriorly (Fig. 1). There was no evidence of a bony cervical spine injury. Bleeding in the deep neck was suspected strongly. A general physician at that hospital was reluctant to treat the pa-

tient without a surgeon's assistance. Tracheal intubation prior to transport was desired. However, the physician made an optimistic prediction that the patient would not choke during transport because he was not stridorous at that time. He was transported to Iida Municipal Hospital by ambulance. During transport, he felt dyspneic in the supine position and was placed in the sitting position with 5 l/min of oxygen.

About 1 h later the ambulance arrived and a surgeon examined the patient. Physical examination revealed the patient had dyspnea but was making an effort to breathe deeply in the sitting position. Respiratory rate was about 20–25 breaths per minute. His neck was short and thick with no palpable mass. There was no area of ecchymosis on his posterior neck. SpO₂ was 95%–96% on 5 l/min of oxygen. Approximately 30 min after the patient's arrival, the surgeon decided to carry out CT to reevaluate the size of the hematoma before operation. During the CT scan, dyspnea developed suddenly and the patient became tachypneic. The surgeon tried tracheal intubation over and over again with an inside diameter (I.D.) 8.0-mm tracheal tube, but was unsuccessful. The surgeon gave diazepam 10 mg intravenously to the patient to sedate him for easy tracheal intubation. Then the patient became cyanosed and the SpO₂ fell below 85%. The surgeon called an anesthesiologist urgently for assistance of airway management.

The anesthesiologist attempted to intubate with an I.D. 7.5-mm tracheal tube, but was also unsuccessful. Then the anesthesiologist reattempted, directing the surgeon to prepare fiberoptic intubation and emergent tracheostomy. The anesthesiologist successfully intubated blindly with an I.D. 6.0-mm tracheal tube. The patient was quickly relieved from dyspnea with no resistance to breathing. CT scan revealed no further extension of retropharyngeal hematoma and showed that the tracheal tube, which was fixed at a right oral angle at a depth of 26 cm from its end, was placed about 5.5 cm proximal from tracheal bifurcation and the most

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Fig. 1. Computed tomography shows severe tracheal stenosis due to retropharyngeal hematoma (RH). The trachea (T) is indicated by the white arrow

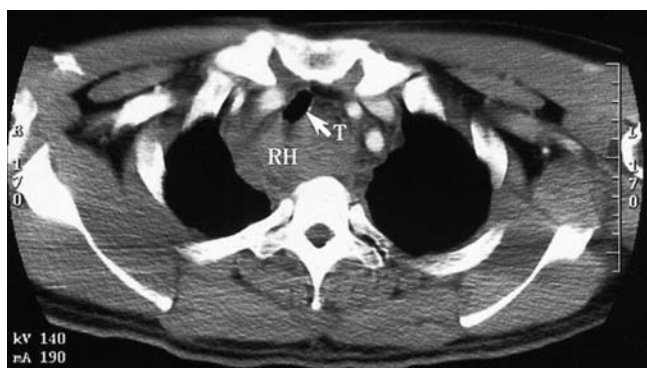


Fig. 2. The lower trachea (T) distal to the end of the tube was widened by the tracheal tube and patent for 1–2 cm, although it was compressed by the retropharyngeal hematoma (RH)

stenosed part of trachea was widened by it. The lower trachea distal to the end of the tube was patent for 1–2 cm, although it was compressed by the hematoma (Fig. 2). The CT image showed no change in the size of the hematoma in comparison with the previous one obtained about 3 h earlier. The surgeon decided to delay surgical drainage. The patient was transferred to the intensive care unit and ventilated in synchronized intermittent mandatory ventilation mode using 3–5 mmHg positive end-expiratory pressure. The next day, a chest X-ray showed a tendency toward normalization of the widened mediastinum. The patient was weaned from mechanical ventilation with no trouble and could breathe easily through the tube. As the hematoma got smaller day by day, the location of the end of the tube shifted deeply and was corrected appropriately.

The CT image on the fifth day showed that the size of the hematoma was much smaller and the trachea was fairly relieved. On the ninth day, the trachea was completely relieved from the hematoma. Although we pre-

pared for reintubation against airway obstruction after extubation, we were able to extubate the tube with no trouble.

The retropharyngeal hematoma was completely absorbed on the fourteenth day. Afterward the patient was discharged uneventfully.

Discussion

Anatomically, the retropharyngeal space is the space between the posterior pharyngeal wall and the anterior wall of the vertebral column. A mass lesion formed in the space is clinically very important because of the potential hazard of acute progressive airway obstruction. Retropharyngeal hematoma may occur in any age group [1]. Its etiologic factors include anticoagulation or bleeding disorder, tumor, ruptured aneurysm, infection, and major cervical injury [2–6]. It is sometimes associated with internal jugular venous cannulation, arteriography, carotid sinus massage, or hyperextension injury, and also occurs spontaneously [1–5].

The formation of retropharyngeal hematoma usually results from tearing of the longus colli muscles on the anterior wall of the cervical vertebral bodies, damage of the anterior ligament, and rupture of the anterior muscular and spinal branches of the vertebral arteries that cover the anterior aspect of the vertebral column [2]. Taking all things into consideration, the external forces that strongly hyperextend the cervical spine may lead to bruising and laceration of the soft tissues of the retropharyngeal space, tearing of vessels, and development of hematoma [1,3–5].

Massive bleeding in the retropharyngeal space affects the pharynx, larynx, esophagus, and trachea. The amount of bleeding is directly related to the severity of signs and symptoms, such as, inspiratory stridor, dyspnea, hoarseness, neck pain, dysphagia, and odynophagia [7].

A lateral neck X-ray or a cervical CT image that shows marked widening of the prevertebral space makes the clinical diagnosis of retropharyngeal hematoma [5]. The normal width of the prevertebral space below the larynx is less than that of the adjacent cervical vertebra [1].

Initial treatment of retropharyngeal hematoma requires keeping the upper airway stable. In this case, there are several points to be discussed about the emergent airway management. First, this patient should have been intubated as soon as possible. Because normal airway diameter is sufficiently large to breathe without resistance, a healthy person feels no sense of dyspnea until the airway becomes quite narrowed. Therefore, the initial sense of dyspnea is a very important indicator of potential airway crisis. Second, the surgeon should

have avoided placing the patient in the supine position. Third, it was necessary in managing this patient with a sense of choking not to treat him with sedatives. Fourth, the high inspiratory negative pressure due to dyspnea may have increased the possibility of collapsing the narrow trachea. Mask ventilation using positive end-expiratory pressure may dilate the tracheal stenosis. Fifth, in general, it should be well recognized that airway management by an anesthesiologist is needed in the early stages of the treatment of acute upper airway obstruction such as this case.

In managing patients with the potential development of choking due to retropharyngeal hematoma, it is necessary to widen the stenosed part of the trachea immediately by tracheal intubation or tracheostomy. When tracheal intubation is quite difficult such as in this case, it is necessary to make full use of anesthetic airway management, such as fiberoptic intubation. However, fiberoptic intubation using a laryngeal mask airway should be done only by those who are skilled in the technique because the shape of the larynx may change abnormally as a result of a massive retropharyngeal hematoma.

After keeping the upper airway open, two treatments are available: drainage [1,5–7] and observation [2,4–7]. In cases of rapid expansion or bacterial infection of retropharyngeal hematoma, surgical drainage may be emergently needed to relieve the trachea from compression. When it is confirmed radiographically that the size of the hematoma has not increased and the trachea distal to the end of the tracheal tube is patent, careful observation may be indicated, such as in this case. However, until the retropharyngeal hematoma is absorbed sufficiently, radiographical evaluation of airway tract patency is required. Tracheal fiberoptic at the bedside may easily provide helpful information about lower tracheal obstruction due to retropharyngeal hematoma. If lower tracheal obstruction progresses, surgical drainage should be performed as soon as possible. If retropharyngeal hematoma becomes smaller, the fixa-

tion of the tracheal tube or cannula should be checked because its end may be shifted.

Extubation should not be done until the retropharyngeal hematoma becomes small and is absorbed sufficiently to relieve tracheal compression due to hematoma.

In summary, we described a case of retropharyngeal hematoma after a cervical hyperextension injury in a 40-year-old man. The retropharyngeal hematoma extended from the level of the pharynx down to that of the bifurcation of trachea. The trachea was stenosed quite severely and displaced anteriorly. Dyspnea developed suddenly and the patient was intubated blindly with an I.D. 6.0-mm tracheal tube. On the ninth day, the patient was extubated with no trouble. On the fourteenth day, the retropharyngeal hematoma was completely absorbed. Afterward the patient was discharged uneventfully.

References

1. Senthuran S, Lim S, Gunning KE (1999) Life-threatening airway obstruction caused by a retropharyngeal hematoma. *Anaesthesia* 54:674–678
2. O'Donnell JJ, Birkinshaw R, Harte B (1997) Mechanical airway obstruction secondary to retropharyngeal hematoma. *Eur J Emerg Med* 4:166–168
3. Thatcher J, George D (1987) Retropharyngeal hematoma as a new cause of acute upper airway obstruction in rheumatoid arthritis. *J Rheumatol* 14:1172–1173
4. Smith JP, Morrissey P, Hemmick RS, Haas AF, Bodai BI (1988) Retropharyngeal hematomas. *J Trauma* 28:553–554
5. Daniello NJ, Goldstein SI (1994) Retropharyngeal hematoma secondary to minor blunt head and neck trauma. *Ear Nose Throat J* 73:41–43
6. Chin KW, Sercarz JA, Wang MB, Andrews R (1998) Spontaneous cervical hemorrhage with near-complete airway obstruction. *Head Neck* 20:350–353
7. Shaw CB, Bawa R, Snider G, Wax MK (1995) Traumatic retropharyngeal hematoma: a case report. *Otolaryngol Head Neck Surg* 113:485–488
8. Mitchell RO, Heniford BT (1995) Traumatic retropharyngeal hematoma—a cause of acute airway obstruction. *J Emerg Med* 13:165–167