

Case Report



Traumatic Retropharyngeal Hematoma following Cervical Vascular Injury: A Case Report

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Conflict of Interest

The authors have no financial conflicts of interest.

ABSTRACT

Traumatic retropharyngeal hematoma is a potentially life-threatening complication of cervical spine injury due to possible airway obstruction. Treatment by securing airway and subsequent conservative care is often adequate. However, a rapidly expanding large hematoma requires surgical evacuation. We present a case of 55-year-old man with a retropharyngeal hematoma secondary to cervical vascular injury without associated cervical fracture. The patient was successfully treated with endovascular arterial embolization and subsequent percutaneous drainage under fluoroscopic guidance without any sequelae.

Keywords: Neck; Hematoma; Vascular system injuries; Airway obstruction

INTRODUCTION

Retropharyngeal hematoma is a known complication of cervical spine injury. Its clinical importance is well recognized due to the possibility of life-threatening airway obstruction. In most cases, the fractured vertebral bodies and adjacent soft tissue including anterior longitudinal ligament are the source of hematoma. Authors present a case of retropharyngeal hematoma secondary to cervical vascular injury without associated cervical fracture.

CASE REPORT

A 55-year-old man without prior medical history visited the emergency department (ED) after a bicycle accident. He presented with swelling of right orbit, and posterior neck pain with mild tingling sensation involving both hands. A computed tomography (CT) scan of head and neck revealed a blow-out fracture of right orbit without evidence of cervical spine injury. A retrospective analysis of spine CT (**FIGURE 1**) showed retropharyngeal lesion with a maximum depth of 26 mm at the C6–7 level, which was missed at the time. Average Hounsfield unit of the lesion is 70 and more consistent with acute hematoma than with soft tissue swelling. The patient was recommended to undergo magnetic resonance imaging (MRI) but he left for home against medical advice. Four hours later, the patient returned to ED with difficulty of breathing and severe swelling of anterior neck. He was immediately intubated with 7.5 Fr



FIGURE 1. Sagittal CT scan the first visit to our ED shows widened retropharyngeal space without fracture or displacement.

CT: computed tomography, ED: emergency department.

reinforced endotracheal tube (ETT) via regular laryngoscopy. Subsequent enhanced neck CT scan revealed massive retropharyngeal hematoma extending from base of the skull to posterior mediastinum and contrast leakage at the level of C6–7 vertebrae (**FIGURE 2**). Laboratory tests including hematologic parameters were within normal range.

The patient was referred for angiography and possible endovascular treatment rather than surgical treatment after discussion with a neck surgeon and an interventionalist. Endovascular treatment was performed through the right femoral artery under light sedation. Electrocardiogram, arterial oxygen saturation, and blood pressure were appropriately monitored. A 6-F Shuttle femoral sheath and 6F guiding catheter (Envoy; Cordis Neurovascular, Miami, FL, USA) was positioned in the right external carotid artery and right subclavian artery, and pre-procedural angiograms were obtained in orthogonal planes. A simple technique, using a single microcatheter, was chosen (Rebar-18; Medtronic, Minneapolis, MN, USA). A superselective right superior thyroid artery posterior branch

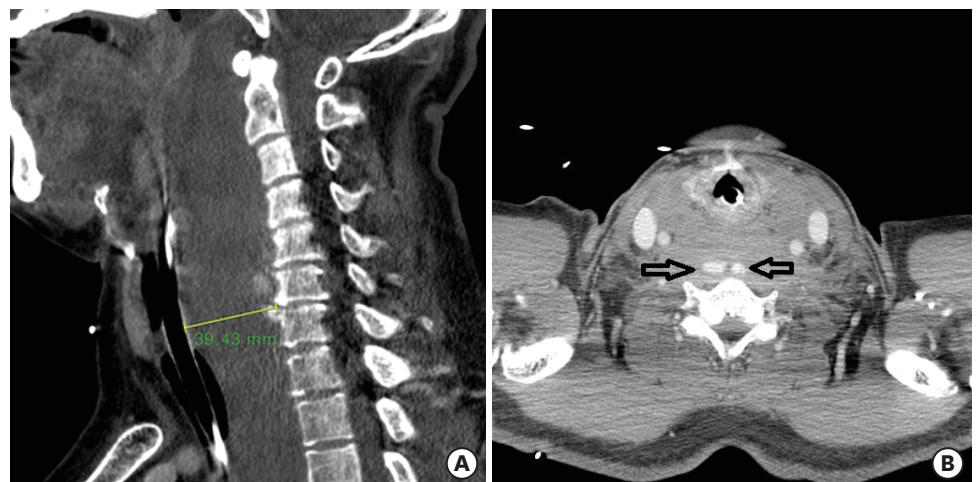


FIGURE 2. Subsequent enhanced CT scan when the patient returned to ED. (A) Massive retropharyngeal hematoma extending from base of the skull to posterior mediastinum. (B) Active contrast leakage (arrow) at the C6–7 level.

CT: computed tomography, ED: emergency department.

angiography demonstrated a pear and string sign of vessel which confirmed dissection (**FIGURE 3**). Two pushable coils (Tornado 3/2; Cook, Bloomington, IN, USA) and polyvinyl alcohol (PVA) particles (Contour 710–1,000 μm ; Boston Scientific, Marlborough, MA, USA) were introduced. Right subclavian artery angiography revealed contrast extravasation (pseudoaneurysm) from several fine branches of right thyrocervical trunk (**FIGURE 4**). Same type of PVA particles were used for embolization of the lesion. Repeated angiography confirmed complete obliteration of both lesions and absence of acute complication.

Hematoma was aspirated with percutaneous techniques under fluoroscopic guidance on hospitalization days (HD) 5 for early decompression and extubation. Forty-five milliliter of hematoma was aspirated initially and pigtail catheter was placed. Total of 120 mL of fluid was drained until HD 8. With second fluoroscopy on HD 10, we found filling defect which is consistent with solid hematoma. Urokinase 200,000 IU was used for total resolution and



FIGURE 3. (A) Right common carotid artery angiography showed pear and string sign of right superior thyroid artery branch (black arrow). (B) Superselective angiography confirmed dissection of right superior thyroid artery branch (black arrow).



FIGURE 4. (A) Right subclavian artery angiography revealed contrast extravasation (pseudoaneurysm) from several fine branches of right thyrocervical trunk (black arrow). (B) Microangiography after PVA particle embolization confirmed complete obliteration of the pseudoaneurysm. PVA: polyvinyl alcohol.

aspiration of hematoma. Subsequent chest CT scan revealed successful removal of hematoma and unexpected complication of right internal jugular vein (IJV) thrombosis. The patient was extubated on HD 14 and treated with an oral anticoagulant (apixaban). The patient's chest CT in 2 weeks confirmed complete resolution of IJV thrombosis, and the patient was discharged without any sequelae.

DISCUSSION

Retropharyngeal and prevertebral spaces are a potential space of loose connective tissue that lies between the middle and deep layers of the deep cervical fascia, and extends from the skull base to the level of third thoracic vertebra.^{7,8)} Hematomas in these spaces are relatively well known despite their rarity, because the expanding hematoma can cause life-threatening airway obstruction. They are associated with major cervical trauma, such as cervical fracture, anticoagulant therapy, iatrogenic injury, infections, foreign body ingestion, and vascular lesions.⁶⁾ However, a few cases of retropharyngeal hematoma after minor blunt force trauma without associated cervical fracture have been reported.⁴⁻⁶⁾

Classical symptoms such as dyspnea, hoarseness, dysphagia and neck swelling may not be apparent during the initial visit. Radiographic imaging of lateral spine can provide valuable information. Wholey et al.¹⁰⁾ reported that normal prevertebral soft tissue width measured at C2 and C6 level ranges between 1 and 7 mm and 9 and 22 mm, respectively. Penning⁷⁾ established normal values of the retropharyngeal soft tissue width for all cervical levels with lateral radiographs. Rojas et al.⁹⁾ conducted similar analysis with multidetector CT. Even though MRI can be used to illustrate retropharyngeal hematoma relatively well, various pitfalls including saturation pulse, artifacts from denture and intubation apparatus, the esophageal fluid can mask its existence.³⁾ In our case, despite absence of any symptom or associated cervical fracture, the widened retropharyngeal soft tissue was the sole indicator of retropharyngeal hematoma during the first visit to ED and was missed at the time.

The treatment of retropharyngeal hematoma is based on securing the airway, which is the most important step. Surgical evacuation of large, rapidly expanding hematoma is indicated although in most cases conservative treatment is recommended.^{4,6-8)} Despite advancement in endovascular embolization of intracranial aneurysmal lesion, thoracic and abdominal traumatic lesion, very few cases have been reported embolization as the treatment option of retropharyngeal hematoma.^{1,2)} The choice between traditional surgical approach or endovascular approach depends on the clinical status of the patient, complexity and approachability of the lesion, availability of interventionist, and associated injury including esophagus, trachea, spinal structures.²⁾ Authors chose endovascular approach because the patient was stable without any adjacent organ injury, risk of missing bleeding focus in small surgical window was high, extent of hematoma was too great vertically for surgical approach. Endovascular arterial embolization of acute retropharyngeal hematoma and subsequent percutaneous drainage should also be considered as a viable treatment option in appropriate clinical situations.

CONCLUSION

We report a rare case of traumatic retropharyngeal hematoma without associated cervical spine injury. Prevertebral widening and possibility of retropharyngeal hematoma should be evaluated in patients sustaining blunt force trauma to head and neck. Newer treatment options with endovascular arterial embolization and subsequent percutaneous drainage are available for treating retropharyngeal hematoma.

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