

# Retropharyngeal Hematoma Formation Following Whiplash Injury

## Whiplash Injury Sonrası Gelişen Retrofarengeal Hematom Formasyonu

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### ABSTRACT

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Retropharyngeal hematoma not associated with a cervical fracture is a rare occurrence. Etiologies range from blunt trauma to whiplash injury and foreign body ingestion. The diagnosis of retropharyngeal hematoma relies on a clinical examination and radiography. Treatment of retropharyngeal hematoma is conservative in the majority of cases, with close observation. Nevertheless, surgical intervention is sometimes indicated for large, non-resolving hematomas. We present the case of a 52-year-old man with retropharyngeal hematoma with a compromised airway due to whiplash injury, which required surgical intervention.

#### Keywords

*Hematoma; whiplash injuries*

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### ÖZET

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Servikal kırık olmaksızın gelişen retrofarengeal hematom oldukça nadirdir. Etiyolojiye bakıldığında künt travmadan whiplash injuriye ve yabancı cisme kadar çeşitli faktörler yer almaktadır. Retrofarengeal hematomun tanısı klinik muayene ve radyolojik teknikler yardımıyla konulur. Olguların çoğunda konservatif yöntem yeterli olurken, bazen büyük ve rezorbe olmayan hematomlarda cerrahi girişim gerekebilir. Bu çalışmada 52 yaşında erkek hastada whiplash injury sonrası hava yolu kompresyonuna sebep olan ve cerrahi girişim gerektiren retrofarengeal hematomlu olguyu sunuyoruz.

#### Anahtar Sözcükler

*Hematom; whiplash injury*

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**INTRODUCTION**

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The retropharyngeal space is a potential space that lies posterior to the buccopharyngeal fascia surrounding the pharynx. It lies anterior to the prevertebral fascia of the cervical and thoracic spine and extends laterally to the carotid sheaths. It begins at the skull base and terminates in the superior mediastinum.<sup>1-5</sup> The mechanisms triggering hemorrhage into the retropharyngeal space may be injury to the longus colli muscles on the anterior surface of the vertebral bodies, the anterior longitudinal ligament or the anterior muscular and spinal branches of the vertebral arteries.<sup>5</sup>

These injuries are most commonly associated with a variety of conditions, including rapid head movements, violent coughing or sneezing, parathyroid adenoma hemorrhage, cervical spine trauma, great vessel trauma, anticoagulant therapy, hemorrhagic diathesis, iatrogenic injuries, infections, foreign body ingestion, hyper-extension of the neck, carotid artery aneurysm, metastatic disease and can even occur spontaneously.<sup>1-4,10</sup>

Isolated retropharyngeal hematoma caused by whiplash injury without a cervical fracture is a rare occurrence.<sup>2</sup> Sore throat, shortness of breath, dysphagia and odynophagia, either alone or in various combinations, may be the initial symptoms, although bruising and tenderness and swelling of the neck can sometimes make the diagnosis more obvious.

We present the case of an isolated retropharyngeal hematoma after minor cervical trauma without an associated cervical fracture, review the pertinent literature, and discuss the diagnosis and treatment of this entity.

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**CASE REPORT**

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A 52-year-old man presented to the emergency department 72 h after sustaining whiplash injury to the head secondary to a fall in his bathroom. The patient's past medical history was otherwise unremarkable, and did not include use of anticoagulants or anti-platelet agents. He was a heavy smoker and drinker. The reason of the fall was alcohol abuse. On arrival, the patient spoke in a muffled voice with a mild stridor. He was complaining of a sore throat and difficulty in swallowing.

Upon physical examination, he presented with an oral temperature of 37.6 °C, a pulse rate of 80 beats/min,

a respiratory rate of 30/min, and blood pressure of 130/80 mmHg, and oxygen saturation, 94% in room air.

Examination of the oral cavity and pharynx revealed a hematoma involving the posterior pharyngeal wall. No trismus was noted and the floor of the mouth was soft. The flexible nasopharyngoscopy showed significant anterior bulging of the posterior pharyngeal wall with reddish discoloration but no ecchymosis. There was some subcutaneous bruising on the front of his neck (Figure 1).

Laboratory studies were significant for a prothrombin time (PT) of 98 seconds and partial thromboplastin time (PTT) of 30.6 seconds. The electrolyte panel was unremarkable, and the complete blood count demonstrated a white blood cell count of 11,000/muL, hemoglobin 13.1 g/dL, hematocrit 39.7%, and platelet count of 279,000/muL. The results of laboratory tests were normal. He underwent an urgent radiograph of the neck and computed tomography (CT). Lateral cervical radiography showed a marked prevertebral soft-tissue swelling, with no cervical spinal fracture (Figure 2).

CT scan of the neck disclosed a midline hypo-attenuating retropharyngeal collection without any peripheral enhancement, that ventrally displaced the posterior pharyngolaryngeal wall. The airway was not significantly narrowed (Figure 3). After CT angiography, an ill-defined high-density collection of contrast agent was not noted within the hematoma. This ruled out active extravasation of contrast agent. Bilateral external carotid, subclavian, vertebral and common carotid arteriograms were negative (Figure 4).

Cervical fracture and atlanto-occipital dislocation were ruled out after neurosurgery consultation and eva-



**Figure 1.** The subcutaneous bruising in front of the patient's neck.



**Figure 2.** Lateral cervical radiography showing a marked prevertebral soft-tissue swelling, with no cervical spinal fracture.



**Figure 3.** CT scan of the neck disclosed a midline hypo-attenuating retropharyngeal collection, without peripheral enhancement that ventrally displaced the posterior pharyngolaryngeal wall.

cuation of the hematoma was carried out under general anesthesia via transoral approach. No supraglottic or glottic obstruction was noted on laryngoscopy; however, some resistance to the passage of a size 7.0 endotracheal tube was felt below the vocal cords. Operative

findings revealed edematous changes with a hematoma over the oropharynx, hypopharynx, and the opening of the esophagus. A 3 cm vertical incision was taken posterior pharyngeal wall and retropharyngeal space was opened with blunt and sharp dissection. At least 300 ml of blood and clots were removed with the help of suction and elevator sweep.

The patient was discharged after 4 days in the hospital with complete resolution of symptoms. His airway, voice and swallowing function returned to normal.

## DISCUSSION

The retropharyngeal space, situated between the middle and deep layers of the cervical fascia, extends from the skull base to the superior mediastinum at the level of the second thoracic spine. Blood entering the space can cause retropharyngeal hematoma.<sup>1-3</sup>

Retropharyngeal hematoma is a rare entity that may progress rapidly into airway obstruction. As blood enters the retropharyngeal space, the expanding hematoma



**Figure 4.** After CT angiography an ill-defined high-density collection of contrast agent was not noted within the haematoma. This ruled out active extravasation of contrast agent.

can cause tracheal compression, which may rapidly progress to acute airway obstruction.<sup>4,5,10</sup> Bleeding into the retropharyngeal space is serious because of the anatomic peculiarity of the pharyngeal muscles, of which insertions move toward their origins, offering no resistance to expansion of the hematoma. As the hematoma expands, compression of the arythenoid cartilage can occur, closing the vocal cords and obstructing the airway.<sup>6,10</sup>

The incidence of airway obstruction resulting from retropharyngeal hematomas is low, but its occurrence can be life threatening.<sup>3,4,7</sup> Etiologies of retropharyngeal hematoma include infection, cervical spine trauma, great vessel trauma, violent head movements, iatrogenic injury, parathyroid adenoma hemorrhage, and foreign body ingestion but they have also been attributed to, bleeding diathesis, carotid sinus massage, metastatic disease and can even occur spontaneously.<sup>1-3,5</sup> Although our patient manifested no coagulopathic state, he may have been at increased risk for developing the hematoma because of severe vomiting secondary to drinking and whiplash injury secondary to fall.

Patients classically present with "Capp's Triad" which includes compression of the trachea and esophagus, displacement of the trachea anteriorly and bruising of the neck and chest.<sup>5,7,10</sup> Capps triad may not always be present. The patient may present with sore throat without stridor, which may lead to an initial diagnosis of pharyngitis or abscess. The initial symptoms of airway compression may include dyspnea, dysphagia, stridor, odynophagia, hoarseness and neck pain.<sup>5,8,9</sup> Although most patients become symptomatic immediately or within hours of the development of the hematoma, there have been reports of patients who experienced airway obstruction as long as five days after developing the initial symptoms of airway compression.<sup>5</sup> Tracheotomy may be preferred, to avoid further damage to the posterior wall of the pharynx during intubation or, if oxygen saturation cannot be maintained above 90%, by other means. Our patient had mild stridor and oxygen saturation, 94% on room air and the patient showed no progression of airway compromise by history during the three days before presentation or while under observation in the emergency department, so that we did not apply to tracheotomy. However, he had a large hematoma and he was complaining of a sore throat and difficulty swallowing. He did not eat anything in three days.

The diagnosis of retropharyngeal hematoma relies on a clinical examination and radiography. Radiographic imaging of the lateral cervical spine and chest can

provide valuable information, such as an increased distance between the anterior spine and posterior pharyngeal wall, inverted lordosis, spinal abnormalities and widening of the mediastinum.<sup>1,2,5</sup> A CT scan is also a powerful modality with which retropharyngeal pathology is detected more accurately. This may reveal a well-defined, midline collection separating the posterior pharyngeal wall from the prevertebral muscles. No peripheral enhancement is expected, and the collection should be low attenuation overall. However, if there is active bleeding, a "swirl" of hyperdensity can be seen internally, giving rise to a heterogeneous appearance overall. The major differential diagnosis on CT is tumour or inflammation.<sup>7</sup>

Blood supply to the retropharyngeal tissues arises from branches of the external carotid artery, the pharyngeal trunk of the ascending pharyngeal artery, as well as the vertebral artery.<sup>7</sup> CT angiography is not always performed in cases of retropharyngeal hematoma, but was indicated in our case as evacuation of the hematoma was carried out via transoral approach. And the great vessel trauma was ruled out in this way.

Magnetic resonance imaging (MRI) offers several advantages over CT in terms of multiplanary anatomic display and superior soft-tissue contrast, often allowing more specific diagnoses to be made.<sup>10</sup> On the other hand MRI is less available and requires more patient cooperation, and is therefore difficult to perform in acutely ill patients who may not have stable airways. So that in this case MRI imaging was not preferred.

The role of flexible nasopharyngoscopy cannot be overemphasized. Even a small bulging of the posterior wall of the pharynx should alert the physician and guide his/her clinical strategy towards a high suspicion of retropharyngeal space-occupying lesions.

In the literature, the majority of authors report conservative treatment for successful management of retropharyngeal hematomas. This approach is preferred in the presence of small or rapidly resolving lesions not compressing the trachea. However, surgical intervention is sometimes required. The indications for surgical evacuation of hematomas are large size, difficulties with mechanical ventilation and failure to improve with conservative therapy.<sup>1-3,6</sup>

Oral intubation can be difficult, especially when cervical fracture cannot be ruled out. An alternative strategy is nasal intubation via flexible bronchoscopy. In our case, cervical fracture and atlanto-occipital dis-

location were ruled out after neurosurgery consultation. In this way evacuation of the hematoma was carried out under general anesthesia via transoral approach.

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## CONCLUSION

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Retropharyngeal hematoma is a potentially life threatening event with the danger of acute airway obstruction, and alcohol abuse is a risk factor

for developing hematoma because of severe vomiting, and whiplash injury to the head secondary to fall.

A poor or inadequate response to medical therapy and/or artificial airway support, in the presence of a large, non-resolving retropharyngeal hematoma, should be a clear indication for surgical intervention. The evacuation of the hematoma can be carried out under general anesthesia via transoral approach if servical fracture and atlanto-occipital dislocation is ruled out. Early surgical intervention can reduce the hospital stay, with a good prognosis, and a rapid convalescence.

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