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Post-traumatic Retropharyngeal Hematoma: a Clinical Case

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ABSTRACT The authors report a rare clinical case of extensive retropharyngeal hematoma, associated with undiagnosed injury of the cervical spine with a gradual involvement of the spinal cord into the traumatic disease.

Key words: retropharyngeal hematoma, trauma, spine

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Retropharyngeal hematoma is accumulation of blood in the retropharyngeal space. Bleeding in this potentially dangerous space can be fatal due to the thickening of prevertebral tissues from the base of the skull to the level of a trachea bifurcation with airway compression [1]. Epidemiology is unknown, but retropharyngeal hematoma is believed to be extremely rare [2]. The mortality rate is up to 20% [3]. Retropharyngeal hematomas are conditionally divided into post-traumatic and spontaneous [4, 5]. Causes of spontaneous retropharyngeal hematomas may be anticoagulants, coughing, sneezing, vomiting, carotid aneurysm, and coagulopathy. The most common factor in the development of retropharyngeal hematoma is a neck injury. The causes of post-traumatic retropharyngeal hematoma can also be foreign bodies of the esophageal tract, catheterization of the internal jugular vein. Cases of the development of retropharyngeal hematoma after the blockade of the stellate ganglion are also described. Probable iatrogenic causes include instrumental damage during direct laryngoscopy, endotracheal intubation, endoscopy, as well as surgery on the cervical spine [4, 5]. The exact mechanism of retropharyngeal hematoma formation is currently unclear, there are several potential sources of bleeding: the actual fracture of the vertebrae, rupture of the anterior longitudinal ligament, rupture of the long neck muscle, or rupture of the vessels themselves [6]. Bleeding can occur from the spinal branches of the vertebral arteries that supply the vertebral bodies, the muscle branches of the vertebral artery, or the ascending cervical branch of the inferior thyroid artery, which feeds the deep muscles of the neck. The ascending pharyngeal artery also has multiple anastomoses associated with the muscle branches of the vertebral artery, the ascending cervical branch of the inferior thyroid artery, and the occipital arteries. The literature describes the sources of bleeding from large vessels, such as the thoracic aorta and the thyroid trunk [7].

The onset of the disease is acute, but it happens that several days pass from the moment of the onset until the appearance of a clinical picture. Patients with retropharyngeal hematoma may complain of neck pain, trismus, dysphonia, dysphagia, drooling, hemoptysis, and shortness of breath. The patient assumes a forced posture usually sitting with an emphasis on the arms to support the auxiliary respiratory muscles. Palpation is sometimes determined by infiltration of the neck. Pharyngoscopy reveals a bulging of the posterior pharyngeal wall without signs of a source of bleeding, and a preliminary diagnosis of an infectious or neoplastic lesion is usually established. Airway obstruction is the leading clinical symptom [6].

Complications of retropharyngeal hematomas result from compression of surrounding organs, rupture or infection of the hematoma. Hematoma can cause airway compression, and its rupture can lead to asphyxiation or aspiration pneumonia. It should be remembered that the hematoma is the ideal medium for the development of infection. Perhaps the development of osteomyelitis of the cervical vertebrae. The spread of infection with the development of mediastinitis, purulent pericarditis, pleurisy, pneumothorax and pleural empyema can threaten the patient's life [6].

Treatment of retropharyngeal hematoma is a difficult task. Ensuring adequate airflow is the first step and should be provided before any surgical intervention. Tracheal intubation can be difficult, especially if there is a fracture of the cervical spine. It should also be remembered that intubation carries the risk of perforation of the hematoma. While waiting for a complex intubation, a tracheostomy is clearly indicated. After the restoration of airway patency, two treatment options are available: active surgical tactics and observation. Some authors believe that surgical treatment has no advantages over conservative and is fraught with an increased risk of infection of the surrounding tissues. Most authors believe that patients with small stable retropharyngeal hematomas should be treated conservatively with a re-assessment of hematoma size, as determined by endoscopic examination, computed tomography (CT) or magnetic

resonance imaging [8].

For large, progressive retropharyngeal hematomas, as well as those that do not diminish during treatment, surgical drainage is indicated [8].

Here is a case study: a rare observation of extensive post-traumatic retropharyngeal hematoma with a fatal outcome.

A 62-year-old male patient F., resident of the Moscow region, on Oct 10, 2017 addressed the emergency department of the city hospital at the place of residence with complaints of discomfort in the neck, difficulty swallowing, rhinism, slight difficulty in breathing. A history of falling from the stairs the day before. When viewed in the emergency department: conscious, no neurological symptoms, free breathing, slight degree of hoarseness is noted. Soft tissues of the neck are not visually altered. Pharyngoscopy: there is a bulging of the posterior wall of the oropharyngeal cavity and larynx. Puncture infiltration revealed hemorrhagic discharge. CT scan of the neck was performed: no osteo-destructive changes were detected. There was a soft-tissue formation with rather even contours of a non-uniform structure, which occupied almost the entire retropharyngeal space, descending into the posterior mediastinum along the esophagus, pushing aside the surrounding tissue, distorting the larynx and trachea.

Conclusion. CT signs may correspond to the volume formation of the retropharyngeal space, the forming abscess of the upper retropharyngeal space (Fig. 1). The patient refused hospitalization. The written consent was received. The next day, the patient was delivered via ambulance with severe respiratory failure to the emergency department at the place of residence, where he was immediately hospitalized to the intensive care unit. Tracheal intubation and displacement of the larynx were unsuccessful due to severe edema, and the patient underwent emergency cryoconicotomy, then, intubation tube was installed, and artificial respiration was started. Upon admission: coma of II degree. The neck is diffusely enlarged, no subcutaneous emphysema or crepitus. Pharyngoscopy: the posterior wall of the orolarynx and laryngopharynx is dramatically bulging. Blood test dated Oct 16, 2017: leukocytes $58.42x10^9$/l, erythrocytes $4.25x10^{12}$/l, hemoglobin 122 g/l, platelets $770x10^9$/l, lymphocytes $14.4x10^9$/l, monocytes $28.82x10^9$/l, neutrophils $15.2x10^9$/l. Biochemical analysis of blood dated Oct 17, 2017: amylase 50 U/l, ALT 100.1 U/l, AST 129.0 U/l, urea 21.0 mmol/l, total bilirubin 14.9 mmol/l, conjugated bilirubin 7.4 mmol/l, total protein 43.8 g/l, glucose 8.0 mmol/l.

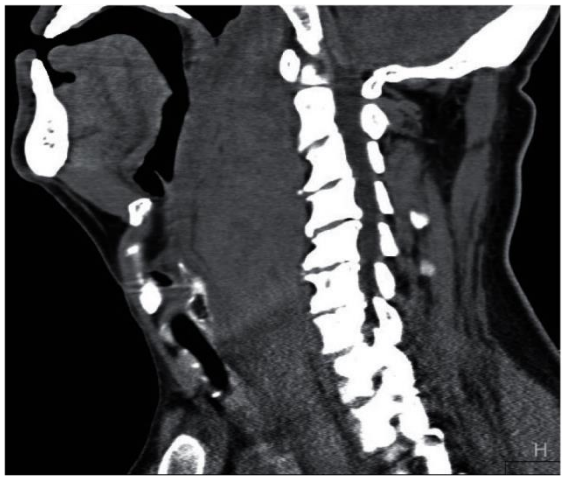

Fig. 1. Computed tomography of the neck of 15.10.17: there is a heterogeneous soft-tissue formation with fairly even contours, which occupies almost the whole pharyngeal space, descending into the posterior mediastinum, along the esophagus, pushing back surrounding tissues and deforming the larynx and trachea

Fig. 2. Computed tomography of the neck of 15.10.17 (revision): there is a marginal fracture of the upper parts of C7 without displacement

On Oct 16, 2017 the revision and drainage of the cellular tissue spaces of the neck and posterior mediastinum by the cervical approach were performed together with otolaryngologist from M.F. Vladimirsky MRRCI. In the course of the surgical procedure, an extensive hematoma of the retropharyngeal space spreading to the posterior mediastinum was opened, about 700 cm^3 of formed blood clots were evacuated. When revising the source of bleeding was not detected. The wound was drained by double lumen drainage, tightly tamponed with gauze sponge.

Blood test dated Oct 18, 2017: leukocytes $61.14x10^9$/l, erythrocytes $2.76x10^{12}$/l, hemoglobin 79 g/l, platelets $1,521x10^9$/l.

Blood test dated Oct 19, 2017: leukocytes $53.54x10^9$/l, red blood cells $2.68x10^{12}$/l, hemoglobin 75 g/l, platelets $1,372x10^9$/l.

Despite the ongoing hemostatic and antibacterial therapy, there was a moderate bleeding through the drainage. Against the background of increasing swelling of the brain stemthe patient died on Oct 19, 2017.

Pathological diagnosis: closed intervertebral disc rupture between C6 and C7 with a rupture of the anterior longitudinal ligament of the spine, massive hemorrhage into the adjacent soft tissue of the neck with the formation of hematoma, the spread of hemorrhage into the mediastinal tissue; hemorrhage over the dura mater of the spinal cord in the cervical region. Complication: upward swelling of the spinal cord, swelling of the brain stem.

CT scan pictures of the neck on Oct 15, 2017 were revised by radiation diagnosticians of M.F. Vladimirsky MRRCI: limited retropharyngeal hematoma of heterogeneous density. The visceral organs are displaced anteriorly with a narrowing of the laryngeal lumen, especially at the level of the prefold portion of the larynx and the upper esophagus. There is a marginal fracture of the upper sections of C7 without displacement. Signs of osteochondrosis of the cervical spine. Fractures of massive anterior osteophytes are not excluded. The vascular space is displaced laterally, poorly differentiated. It is not possible to estimate the possible source of bleeding from the non-contrast study.

Patient's tests were also sent for a consultation to a hematologist of M.F. Vladimirsky MRRCI. The conclusion was received: "... judging by the increase in leukocytes and platelets, the patient had undiagnosed myeloproliferative disease. "

In our opinion, in this observation, the cause of a retropharyngeal hematoma was an undiagnosed cervical spinal injury with a gradual involvement of the spinal cord. Incorrect interpretation of damage symptoms, difficulty in interpreting the results of radiation methods of research and late seeking medical assistance are the main causes of diagnostic errors. A possible cause of continued bleeding after surgery was the above blood pathology.

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