

Case Report**Diagnosis and conservative therapy of retropharyngeal hematoma****Wahyu Tri Novriansyah, Novialdi Nukman**Department of Otorhinolaryngology-Head and Neck Surgery,
Faculty of Medicine Andalas University/Dr. M. Djamil General Hospital, Padang**ABSTRACT**

Background: Retropharyngeal hematoma is the accumulation of blood clots in the retropharyngeal space which can cause upper airway obstruction. Until now, controversy over surgical versus conservative therapy is still being debated. **Purpose:** Reporting one rare case of retropharyngeal hematoma. **Case report:** A 72-year-old man was brought to the emergency room with complaints of worsening dyspnea for 12 hours, after slipped and fell in the bathroom. Physical examination revealed purple discoloration on the posterior pharyngeal wall, CT scan showed inhomogeneous hyperdense masses, and coagulopathy. The patient underwent conservative therapy but finally died on the day-10 of treatment. **Clinical question:** How effective is the conservative therapy in retropharyngeal hematoma compared to surgical therapy? **Review method:** A literature search using keywords "retropharyngeal hematoma" was conducted through Pubmed and Google Scholar. **Result:** Management of retropharyngeal hematoma is still controversial due to the lack of widely accepted guidelines. **Conclusion:** Conservative therapy in cases of retropharyngeal hematoma, should be administered aggressively, comprehensively, and with a strict protocol.

Keywords: retropharyngeal hematoma, cardiac arrest, upper airway obstruction, coagulopathy

ABSTRAK

Latar belakang: Hematoma retrofaring adalah penumpukan bekuan darah di ruang retrofaring yang dapat menyebabkan obstruksi jalan nafas bagian atas. Hingga saat ini, kontroversi mengenai terapi bedah versus konservatif masih menjadi perdebatan. **Tujuan:** Melaporkan satu kasus hematoma retrofaring yang jarang terjadi. **Laporan kasus:** Seorang pria berusia 72 tahun dibawa ke ruang gawat darurat dengan keluhan sesak nafas yang semakin memburuk sejak 12 jam setelah jatuh karena terpeleset di kamar mandi. Pada pemeriksaan fisik didapatkan warna keunguan pada dinding posterior faring, CT scan terlihat massa hyperdense yang tidak homogen, serta koagulopati. Pasien menjalani terapi konservatif namun akhirnya meninggal pada hari ke-10 pengobatan. **Pertanyaan klinis:** Seberapa efektif terapi konservatif pada hematoma retrofaring dibandingkan dengan terapi bedah? **Telaah literatur:** Pencarian literatur menggunakan kata kunci "retropharyngeal hematoma" dilakukan melalui Pubmed dan Google Scholar. **Hasil:** Penatalaksanaan hematoma retrofaring masih menjadi kontroversi karena belum adanya pedoman yang diterima secara luas. **Kesimpulan:** Terapi konservatif pada kasus hematoma retrofaring sebaiknya diberikan secara agresif, komprehensif, dan dengan protokol yang ketat.

Kata kunci: hematoma retrofaring, henti jantung, obstruksi jalan nafas atas, koagulopati

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INTRODUCTION

Retropharyngeal hematoma is the accumulation of blood clots in the retropharyngeal space which can cause painful symptoms and difficulty swallowing up to obstruction of the airway. The most common cause is trauma, even minor trauma. Most cases are treated conservatively. The case reports available to date are still scant and the debate between surgical and conservative therapy is still going on.¹

The retropharyngeal space (RPS) extends from the base of the skull to the posterior mediastinum, ending at the level of the second to sixth thoracic vertebrae. The RPS consists of adipose tissue and lymph nodes. The blood supply to the RPS generally is arising from pharyngeal blood flow. The superior pharynx receives its blood supply from the ascending pharyngeal artery and the minor palatine artery. The inferior pharyngeal blood supply comes from the superior thyroid artery and the inferior thyroid artery. In addition, the RPS is directly adjacent to the carotid sheath which contains the internal carotid artery, common carotid artery, internal jugular vein, and the vagus nerve.²

The cause of retropharyngeal hematoma is including trauma, oropharyngeal foreign bodies, spontaneous rupture of blood vessels, et cetera. The accumulated hematoma compresses the airway, via two mechanisms. The first mechanism is direct compression by the hematoma at the level of the larynx, or pressing the trachea anteriorly. The second is, inflammation induced by the hematoma will create edema of the larynx and cause hoarseness and dyspnea when the inflammation is getting worse.³ The frequency of retropharyngeal hematomas is very rare, only about 50 cases of airway obstruction due to retropharyngeal hematoma have been reported in the literature.⁴

Manifestation of retro-pharyngeal hematoma can be asymptomatic, dysphagia,

odynophagia, shortness of breath, neck pain, hoarseness, et cetera. When the hematoma extends into the mediastinum, retro-mediastinal pain may be present. Physical examination reveals ecchymosis of the skin of the neck and anterior chest. When the cause is due to neck trauma, symptoms may be accompanied by neck pain and neurological deficits. Clinical symptoms can appear gradually, and getting worse over time.³

The general management of retropharyngeal hematoma is to maintain patency of the airway and diminish the hematoma, and to manage accompanying symptoms and complications. Death in cases of retropharyngeal hematoma is usually due to airway obstruction and cardiac arrest. There are no data on the mortality of retropharyngeal hematoma.^{1,5}

This case report aimed to review the diagnosis, conservative therapy, and complications that lead to mortality in cases of retropharyngeal hematoma.

CASE REPORT

A 72-year-old man was referred from a private hospital with a diagnosis of 'retropharyngeal abscess' on March 4, 2020. The patient was found lying down in the bathroom floor the day before. The patient complained of pain and difficulty swallowing. Complaint of shortness of breath appeared 12 hours before admission to the hospital. The patient had a CT scan done, and then he was referred to Dr. M Djamil, Padang. There was no fever, nor difficulty opening the mouth. There was no salty taste in the mouth, no pus or blood coming out of the mouth. No history of recurrence, no history of tuberculosis. The patient had been taking medication for heart disease from a cardiologist in the last 1 year previously. There was no history of black stools, no history of bleeding gums. No history of stroke.

Before the initial examination could be carried out, the patient went into cardiac arrest shortly after arriving at the emergency room. Resuscitation was performed and attained the return of spontaneous circulation. The patient was then treated in the intensive care unit without being intubated.

The examination in the intensive care found the general state of severe illness, somnolence, blood pressure 190/100mmHg, pulse 98x/minute, spontaneous breathing, nasal cannula 4L / minute 100% oxygen saturation, temperature 36.4 C. Chest examination found no hyperaemic, ecchymosis, nor edema. Auscultation did not reveal rhonchi or wheezing. On examination of the ear, there was no sign of bleeding, the tympanic membranes were intact, the light reflex was absent. Nasal examination was within normal limits. Examination of the throat found a protrusion bulge on the posterior pharyngeal wall, the mucosa was purplish red. The bulge was then aspirated and obtained <1cc blood from the posterior pharyngeal wall. On examination of the neck, there was no edema, no hyperaemic, nor ecchymosis. Auscultation revealed inspiratory stridor, and which diminished with extension.

Initial laboratory examination found Hb: 13.2 mg/dL, Leukocytes: 17,570 /mL, Haematocrit 36, Platelets 197,000 /mL, PT: 10.7 seconds, INR: 1.02, APTT>180 seconds, D-dimer: 1,230 ng/mL, Total protein: 7.2 d/dL, Albumin: 4.6 g/ dL, Globulin: 2.6 g/ dL, Total Bilirubin: 1.9 md/dL. SGOT: 37 U/L, SGPT: 42 U/L, Blood ureum: 19 mg/dL, Blood creatinine: 1.1 mg/dL, Random blood sugar level: 200 mg/dL, Sodium: 123 mmol / L, Potassium: 3.4 mmol/L, Chloride: 94 mmol/L, Calcium 9.2 mg/dL. Blood gas analysis (AGD) revealed pH: 7.41; pCO₂: 30; pO₂: 107; HCO₃⁻: 18.8; HCO₃std: 21.3; TCO₂: 19.7; BE: -4,7, SO₂: 98. The conclusion of blood gas analysis was compensated respiratory alkalosis.

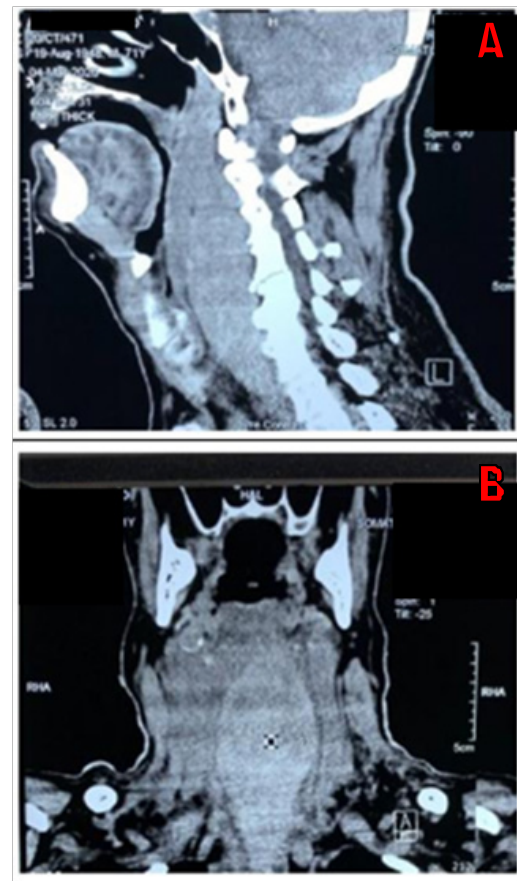


Figure 1. CT scan of the patient
(A) Sagittal plane image
(B) Coronal plane image hematoma clusters on RPS

CT scan of the neck region showed inhomogenous hyperdense mass on the retropharynx with HU 63-70 (suggestive of blood clots). The upper airway was unhampered. The larynx and trachea were pushed anteriorly, and the oesophageal lumen was narrow. Estimated hematoma volume was 150-200 cc.

Diagnosis of retropharyngeal hematoma was established based on history, physical examination, and CT scan, with differential diagnosis of retropharyngeal abscess. The patient was treated conservatively and was closely monitored in the ICU.

Treatment in the ward was medical conservative. Patient was given NaCl 0.9%, intravenous (iv), together with Ceftriaxone 2x2gr, Metronidazole 3x500mg, Levofloxacin 1x750 mg, Lansoprazole 1x30 mg, Dexamethason 3x5 mg, Tranexamic

Acid 3x500 mg, Vitamin K 3x10 mg, Ketorolac 3x30 mg iv. The patient was treated in coordination with the Internal Medicine Department, in assessment of sepsis et causa (e.c) community acquired pneumonia (CAP), overt disseminated intravascular coagulation (DIC) e.c sepsis, hyponatremia, and hypokalemia. The patient was consulted to the Cardiology Department and was diagnosed as cardiomegaly, with an assessment of hypertensive heart disease and received additional therapy of Candesartan 1x8 mg. He was also consulted to the Neurosurgery Department with working diagnosis: Return of Spontaneous Circulation (ROSC) assessment and retropharyngeal hematoma.

On day-3, fiberoptic laryngoscopy (FOL) examination revealed obliteration

of the retropharyngeal area, with a purplish oedematous mucosa pressing against the esophagus and larynx (Figures 2A and 2B). A nasogastric tube (NGT) was inserted and could be seen in the oesophageal introitus. While in there, the NGT was clogged with thick fluid, then the NGT removed. Physical examination found the patient was restless. There were suprasternal, epigastric, and intercostal retractions, accompanied by inspiratory, and expiratory stridor, verifying the diagnosis of grade-3 upper airway obstruction. The patient was then intubated. Informed consent for hematoma evacuation procedure was rejected by the patient's family. He was then transferred to the intensive care room again with the ventilator attached. He was consulted to the Clinical Nutrition Department for total parenteral nutrition.

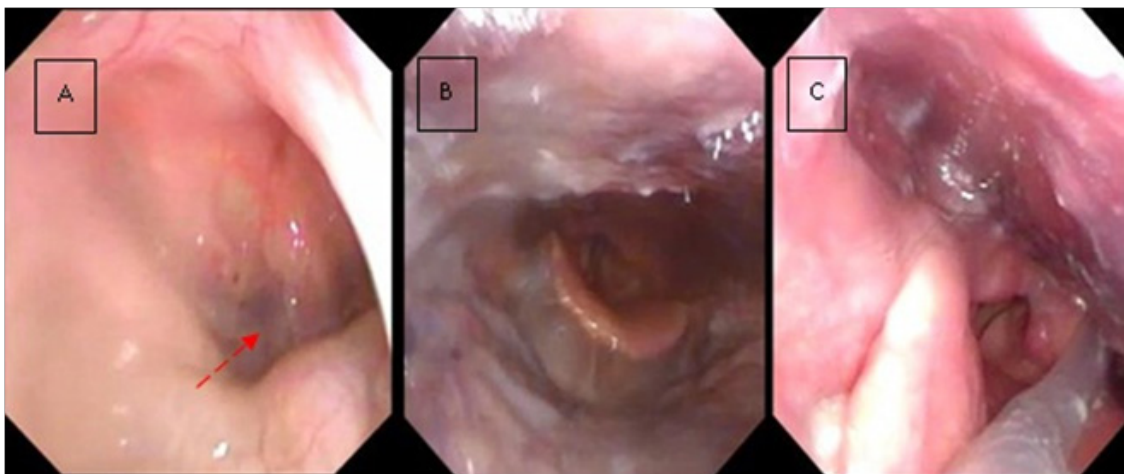


Figure 2. Fiber optic laryngoscopy

- A. View of the hematoma in the nasopharyngeal submucosa wall. (day 3)**
- B. The mucosa of the posterior pharyngeal wall was dark purple (day 3)**
- C. Laryngeal edema, and NGT was seen in the esophageal introitus (day 8)**

On day-4, there was an improvement in the APTT to 19.7 and a decrease in D-dimer to 519 ng / mL. On day-5, the result of the examination from the Orthopedics Department stated there were no fractures of the cervical spine on X-rays and CT-scans.

On day-7, the patient was released from the ventilator, and cervical X-rays were performed with the outcome that the

retropharyngeal hematoma was reduced. The initial thickness of the RPS was 44 mm, reduced to 25 mm at the C5 level (Figure 3). Medical conservative therapy was continued.

On day-8, the patient was fully conscious. The patient complained of swallowing pain and a little tightness in the throat. The patient had been discharged from the ventilator and receiving oxygen therapy via NRM 8L/min

with 100% oxygen saturation. No retraction or stridor was found. The obtained laboratory results showed, Hb: 13.5, Leukocytes 13,490, platelets 114,000, Haematocrit 39%, Erythrocytes 4.43, Ureum 49, Creatinine 1.1 mg/dL, Random glucose level 215, Na 144, K 3.8, Cl 110, Procalcitonin 0.3 ng/dL. Re-evaluation with FOL found diffuse laryngeal edema, attached NGT, and a slightly reduced size of the hematoma compared to the previous FOL (Figure 2.C). On day-9 day, the patient was transferred to the ward.

On day-10 at 13.00 hours, the patient had deterioration of consciousness (GCS E1M3V2), high fever (40C°), blood pressure 90/52 mmHg, respiration 50x/minute, pulse 130x/minute weak, SpO₂ 94% with NRM 10 L/m. Gargle sounds were found on neck auscultation, and rough rhonchi on chest auscultation of the chest. Suction on the oropharyngeal area obtained yellowish secretions. The diagnosis was sepsis, aspiration pneumonia, and infected retropharyngeal hematoma. At 14.00 hours, the patient underwent cardiopulmonary resuscitation but was unsuccessful. The patient was pronounced dead in front of his family and the medical staffs at 14.30 on the 10th day. Cause of death (COD): septic shock. Autopsy was refused by the patient's family.



Figure 3. Lateral cervical X-ray on day 7 (RPS width: 25 mm)

CLINICAL QUESTION

“How effective is conservative therapy in retropharyngeal hematoma compared to surgical therapy?”

REVIEW METHOD

A literature search using keyword “retropharyngeal hematoma” was conducted through Pubmed and Google Scholar. The selection was based on inclusion criteria: managed conservatively at hospital.

RESULT

The result of literature search obtained 20 articles. Thamamongood et al.⁶ reported the efficacy of conservative therapy for a sizeable posterior mediastinal hematoma. Dedouit et al.⁷ reported another case of death due to retropharyngeal hematoma after cervical surgery. The patient underwent cervical spine surgery and experienced post-operative bleeding causing retropharyngeal hematoma. The patient died before the hematoma evacuation could be carried out.

DISCUSSION

Retropharyngeal hematoma is a very rare disease. Less than 100 cases of retropharyngeal hematoma have been reported since described by Capp in 1934 to 2008.^{3,8} According to Ren H et al.⁹ the incidence of hematoma as a complication from spinal cervical surgery, was 0.2% to 5.6%.

Factors causing retropharyngeal hematoma include head and neck trauma, cervical vertebrae injuries, complications after cervical surgery, malignancies, infections, large blood vessel trauma, iatrogenic due to heart catheter or NGT placement, foreign bodies, and angiography procedure. Anticoagulants and hemorrhagic diathesis are predisposing factors for retropharyngeal

hematoma. If there is no explicit aetiology, then this disease is known as a spontaneous retropharyngeal hematoma, which occurs very rarely.^{1,10,11}

Our patient had a history of taking heart disease medicines from a cardiologist for the last one year. Many studies had described the consumption of anticoagulant drugs, antiplatelet drugs, or a combination thereof, such as warfarin and aspirin, which are often prescribed for patients with hypertensive heart disease at risk of arrhythmias as a risk factor for retropharyngeal hematoma. Baden¹² reported one case of retropharyngeal hematoma in a man taking warfarin, an antihypertensive agent, and statin without previous neck injury/trauma. Apart from that, Iida¹, Alherabi⁸ Sinclair¹⁰ Yes¹³, and Solanki¹⁴ each also reported a case of retropharyngeal hematoma in a patient taking anticoagulant/antiplatelet drugs preceded by minor trauma. Also, geriatric patients have additional risk factors for ligament trauma and hematoma formation, such as connective tissue weakness, the presence of osteophytes, and ankylosing spondylitis.⁴

The clinical symptoms of retropharyngeal hematoma vary widely, ranging from mild sore throat to hoarseness, difficulty of swallowing, dyspnoea, or stridor. Sometimes there is an asymptomatic interval between the occurrence of trauma and the appearance of symptoms. The classic symptom known as Capp's triad consists of superior mediastinal obstruction (hoarseness, dysphagia, and neck edema), protrusion of the trachea anteriorly on radiological findings, and ecchymosis of the anterior neck and chest.¹⁵ To differentiate the symptoms of a hematoma from a retropharyngeal abscess, could be seen from the absence of infection symptoms such as fever, restricted neck movement, increased leukocyte count, and coagulation status.^{8,10} In our patient, the symptoms included difficulty of swallowing, which subsequently progressed to shortness of breath and stridor.

There was no bruising in the neck or chest area.

Prolongation of International Normalized Ratio (INR) or also known as prothrombin time test more than 4.5 is a risk factor for bleeding in patients taking anticoagulants.¹ Meanwhile, Alherabi⁸, Lin et al.¹⁰, and Baden¹², each reported a case of retropharyngeal hematoma due to anticoagulant consumption which accompanied by prolongation of PT, APTT, and INR. In our patient, there was an APTT prolongation which was not accompanied by an increase in INR. It could not be ascertained that it was caused by the consumption of anticoagulant drugs only, or due to other factors also.

Radiological examination is very useful in diagnosing retropharyngeal hematoma. X-ray examination of the lateral cervical soft tissue can assess the thickening of the retropharyngeal space.⁸ In addition, a CT scan can also be performed to assess the expansion of the hematoma, and measure the volume of the hematoma. In smaller hematoma lesions, MRI is more sensitive to see a collection of hematomas in the retropharyngeal area, and to assess the cervical spine for signs of neurological disorders.^{11,16} In cases caused by spontaneous bleeding from large blood vessels, CT-angiography and embolization can be performed.¹⁵ In our patient, a CT scan of the neck without contrast was performed, and the appearance of the mass retropharyngeal mass according to the Hounsfield Unit (HU) was 63-70. This correlated to HU for blood clots, which is 50-75. Meanwhile, in deep neck abscesses, the mean HU was reported to be 25-35.¹⁷

Should there be any sign of airway obstruction, intubation need to performed immediately. The bulging of the posterior pharyngeal wall sometimes narrows the airway, especially at the level of the oropharynx, making intubation difficult. Tracheostomy may be an option in difficult cases of intubation. However, in more severe

cases, there is compression that closes the tracheoesophageal lumen, so that even the tracheostomy cannot maintain the airway. In this case, intubation can be performed with the aid of rigid bronchoscopy.²⁰

Most likely our patient got cardiac arrest because of hypoxia and hypokalemia, and should be treated accordingly. Changes in breathing patterns are the most common cause of cardiac arrest in hospitalized patients. In addition, based on Advance Cardiac Life Support (ACLS) guidelines, the cause of cardiac arrest is known as 4H4T, namely hypoxia, hypovolemia, hypo-/hyperkalemia, hypothermia, thrombosis/pulmonary embolism, cardiac tamponade, toxins, and tension pneumothorax.²⁰

The general management of retropharyngeal hematoma is to secure the airway and remove the hematoma. Adequate airway management is required if there are signs of obstruction. Surgical and drainage therapy is performed in cases of hematoma suggestive of infection, presence of foreign bodies, or ongoing expansion of the hematoma. However, in small hematomas, close observation and conservative therapy are considered adequate.^{11,17}

We have not found standard guidelines that can help decide choosing between surgical intervention or conservative therapy. In 2017, Miao et al.¹⁶ proposed guidelines for managing retropharyngeal hematoma after cervical spinal surgery. Hematoma evacuation is recommended if there is dyspnea, neurological disturbances confirmed by MRI, the patient appears restless, and if there is no improvement in symptoms after conservative therapy and close monitoring. However, this line of management is not fully applicable to retropharyngeal hematomas due to anything other than complications of cervical spinal surgery.

Most cases of retropharyngeal hematoma are treated conservatively.²² Conservative

therapy includes close observation, correction of coagulopathy if present, administration of steroids, injection of antibiotics and other supportive therapy. Reduction of the retropharyngeal hematoma could be seen after 4 days until 3 weeks of conservative therapy.^{6,8,12,22,23} In our patient, the cervical X-ray, taken on day-7, showed a reduction in the size of the hematoma from 44 mm to 25 mm at level C5.

The relatively rare case of retropharyngeal hematoma, however, had resulted in unavailability of reports of randomized studies on the efficacy of drugs to accelerate hematoma resorption. However, in the case of chronic subdural hematoma, there were some Randomized Control Trials (RCTs) available, and might provide significant benefit in conservative therapy of retropharyngeal hematoma. Several studies reported that corticosteroids appeared to have an important role as nonsurgical therapy in cases of hematoma, especially chronic subdural hematoma. In the case of a small hematoma, corticosteroids could cause complete reduction. However, the administration of corticosteroids in acute hematoma is still a matter of debate, although several reports had shown a positive effect. Atorvastatin is used in cases of brain injury and stroke because it accelerates angiogenesis and thus accelerates the resorption of the hematoma. Tranexamic acid acts as an anti-fibrinolytic and anti-inflammatory to reduce the risk of recurrent bleeding.²⁴

Coagulopathy in our case, was characterized by an APTT value extending to more than 180 seconds. Therapeutic options to correct coagulopathy (INR) are fresh frozen plasma (FFP), vitamin K, cryoprecipitate, and Prothrombin Complex Concentrates (PCC).^{8,10,12,14,25} The estimated volume of the hematoma calculated from the CT scan in our patient was 150-200 cc. Based on the size of the hematoma, conservative therapy was unlikely to be the preferred choice for

large hematomas, because it would extend the patient's ICU stay, intubation, and total hospital stay. It takes a relatively longer time for the body to absorb the hematoma.²¹ However, we had not found a cut-off size of the hematoma that could be absorbed by the body, so that conservative therapy was favorable. Thamamongood⁶ report showed the efficacy of conservative therapy at a sizeable posterior mediastinal hematoma.

After a proper airway management, hematoma evacuation could be performed after 3-4 days to ensure complete hemostasis had occurred. Thus, it could reduce the risk of recurrent bleeding during surgery.²¹

Hematoma drainage or evacuation can be done through two approaches. The first approach is via transoral. This approach uses the aid of an endoscope to visualize the posterior pharyngeal wall. The incision can be performed vertically, followed by evacuation of the hematoma using suction apparatus. Furthermore, a drain could be installed to anticipate the risk of recurrent bleeding. After surgery, the patient should be intubated until the hematoma has evidently decreased. The transoral approach is the easier approach, although it increases the risk of bacterial contamination in RPS. However, no studies had yet further evaluated the risk of bacterial contamination in the transoral approach.²¹ The second approach is via trans cervical. This approach reduces the risk of bacterial contamination to the RPS, and monitoring fluids via a drain tube is easier.²²

Close observation should be carried out in the ICU. Patients should be intubated until the hematoma receded, and considered not to endanger the airway passage, and proven by serial radiological examinations. The length of time the patient is intubated depends on the size of the hematoma at the time of the initial assessment. Hematoma can be completely absorbed by the body after 2-4 weeks.¹⁴ Our patient showed improvement in clinical symptoms, and then was transferred to the

ward. We suggested extubation should be performed after the radiological assessment confirmed the hematoma had reduced and no longer obstructs the airway. The extubation was performed on day-5.

Airway obstruction is a complication of retropharyngeal hematoma that most often causes cardiac arrest. Suzuki et al.⁴ reported one case of death due to retropharyngeal hematoma following a motor accident, without cervical fracture. The patient went into cardiac arrest and was admitted to the ICU. The patient's hemodynamic remained unstable until finally, he died 11 hours after admission. Dedouit et al.⁷ reported another case of death due to retropharyngeal hematoma after cervical surgery. The patient underwent cervical spine surgery and experienced post-operative bleeding causing retropharyngeal hematoma. The patient died before the hematoma evacuation could be carried out.

On day-10, our patient's condition had deteriorated into sepsis, and finally septic shock rapidly. Unfortunately, the patient died before we had the chance to administer inotropic drugs according to the sepsis shock protocol. We estimated that the presence of tissue necrosis in the pharyngeal mucosa and hematoma due to compression of the hematoma was a good medium for the development of contaminant bacteria and caused sepsis. In addition, the presence of aspiration pneumonia or possibly hospital-acquired pneumonia, as well as a history of cardiac arrest, and hypoxia which had not been resolved completely, contribute to mortality. Betten et al.²⁶ reported a case of death from post-evacuation of the retropharyngeal hematoma, due to aspiration pneumonia and multiple organ failure.

Retropharyngeal hematoma is a rare and potentially life-threatening disease, with atypical clinical symptoms. Radiological examination plays an important role in making the diagnosis and determining the treatment options. The decision to provide conservative

therapy must be followed by an adequate and strict protocol. Airway management is the key to the management of retropharyngeal hematoma. In addition, surgical interventions, namely drainage or evacuation of the hematoma is an option that must be taken immediately if emergency situation arises. One of the complications of retropharyngeal hematoma is aspiration pneumonia, which must be treated aggressively.

The main management of retropharyngeal hematoma is maintaining airway patency, eliminating the hematoma, and managing comorbidities and complications. Medical conservative therapy in cases of retropharyngeal hematoma could be given aggressively, comprehensively, and with a strict protocol. Surgical intervention for retropharyngeal hematoma can be considered immediately to reduce the risk of complications and the length of stay in the hospital.

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