

CASE REPORT

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An unexpected complication after parotidectomy; severe bleeding due to systemic thrombolytic therapy for the treatment of pulmonary thromboembolism

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Abstract

Pulmonary thromboembolism (PTE) is a serious cause of morbidity and mortality after surgery. Since most deaths occur within the first hour of patients, rapid thrombolytic treatment is lifesaving. In this article, a patient who was administered systemic thrombolytic therapy due to PTE after head and neck surgery was discussed. No additional prophylaxis was applied to the patient except for early ambulation. Since PTE has caused hemodynamic instability in the patient, systemic thrombolytics was administered, the PTE was successfully treated but a second surgical intervention was performed to control the bleeding from the surgical site. Systemic thrombolysis for treatment of PTE in otolaryngology surgery patients may be necessary but the morbidity of the bleeding in the surgical site should be considered.

Keywords: Head and neck surgery, pulmonary thromboembolism, systemic thrombolysis

Introduction

Pulmonary thromboembolism (PTE) is a rare complication of surgery in otolaryngology patients (0.2%); which is a common complication after surgeries in gynecology and orthopedics (3% and 10%, respectively) [1]. Aggressive treatment options should be used in patients who are hemodynamically unstable; systemic thrombolysis, surgical embolectomy, catheter-directed intervention are the current treatment modalities [2]. Although systemic thrombolysis is considered contraindicated after surgery, it can be used carefully after some surgeries [3]. Bleeding at the surgical field following is an undesirable effect and bleeding makes physician fear to use systemic thrombolytics. In this case report, we aimed to review the diagnostic and treatment methods of PTE that occurred in a patient after a head and neck surgery. We also evaluated the use of systemic thrombolysis in post-operative patients undergoing head and neck surgery.

Case Report

A fifty-three-year-old female patient was operated because of the pleomorphic adenoma of the parotid gland and a superficial parotidectomy procedure was performed. The surgery lasted 3 hours and the patient underwent general anesthesia for 3 hours and 45 minutes during the procedure. The patient had no known additional disease other than primary hypertension and her body mass index was 36,2 kg/m². The patient was ambulated at the 6th hour of the postoperative period. Preoperative or postoperative venous thromboembolism prophylaxis was not applied except that early ambulation. The patient was discharged on the 4th postoperative day. Six hours after discharge, the patient presented to the emergency department with shortness of breath, chest pain, sweating cold and a short syncope attack. Electrocardiography (ECG) showed findings consistent with PTE (Figure 1). At contrast-enhanced thorax computed tomography (CT) obtained by thromboembolism protocol, there was a filling defect consistent with thrombus in the right main pulmonary artery and distal branches (Figure 2). The patient was hospitalized and low molecular weight heparin (LMWH) was started to the patient subcutaneously twice daily. Echocardiogram showed a pulmonary hypertension (40-45 mmHg), a tricuspid

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valve insufficiency and a right heart failure. Since the patient's hemodynamic instability persisted on the postoperative 6th day, the patient was administered alteplase, which is a recombinant form of human tissue plasminogen activator. After starting thrombolytic treatment with alteplase, active bleeding from the parotidectomy incision scar and a hematoma has occurred in the surgical site and as a result, the blood supply of skin flap formed for parotidectomy was disrupted (Figure 3). The patient was re-operated and the surgical field was explored under local anesthesia. The patient was discharged from the intensive care unit on the 12th postoperative day. The patient has followed up for 6 months. Rivaroxaban (direct factor Xa inhibitor) was administered to the patient for maintenance treatment during this period and no complication was observed.



Figure 3. Bleeding continues from the parotidectomy incision and hematoma is seen at the surgical site.

Discussion

PTE is a rare complication of surgery in otolaryngology patients in the postoperative period but since the situation can be rapidly mortal, it is important to initiate effective treatment as early as possible to prevent mortality. Moreano et al. investigated the frequency of deep venous thrombosis (DVT) and PTE in otolaryngology-head and neck surgery and reported the prevalence of DVT as 0.3% and the prevalence of PTE as 0.2%. In the same study, the prevalence of PTE among head and neck patients was reported to be more frequent than otology-neuro-otology and general otolaryngology patients (0.4%, 0.2%, 0.04%, respectively) [1]. Patients with two or less risk factors should be categorized as a low risk category and these patients can be put on per-operative TED (Thrombo-Embolus Deterrent) stockings or operated without any prophylactic measures. Patients with between three and five risk factors or those who have undergone neuro-otologic surgery should be categorized as a medium risk group and these patients should be dressed in Kendall & TED stockings or given LMWH prophylaxis. Patients with more than five risk factors or who have undergone microvascular surgery should wear Kendall & TED stockings and also LMWH should be applied [1].

Numerous risk factors for PTE have been reported in the literature. Moreano et al. revised the possible risk factors for PTE in otolaryngology practice and recommended prophylaxis for patients with a three or more of risk factors for PTE (Table 1) [1]. Ah-See et al. investigated DVT and PTE prophylaxis among the otolaryngologists performing head and neck surgery and reported that 57% of otolaryngologists did not routinely apply any prophylaxis, while 43% reported applying prophylaxis for their patients [4]. In this case, performing head and neck surgery, age of the patient over than 40 years-old, obesity (the patient's body mass index was 36.2 kg-m²), operation's time that longer than 2 hours were found as case-specific risk factors.

Early diagnosis is lifesaving in pulmonary thromboembolism [5]. Zhang et al. reported the diagnosis of PTE according to the

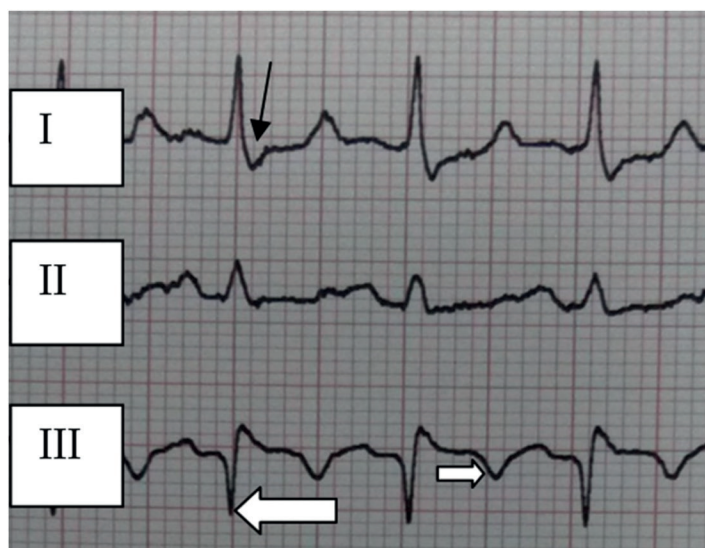


Figure 1. Electrocardiography with prominent S wave (black arrow) from lead I, prominent Q wave (thick white arrow), and negative T wave (fine white arrow) from lead III which are suggestive of PTE.

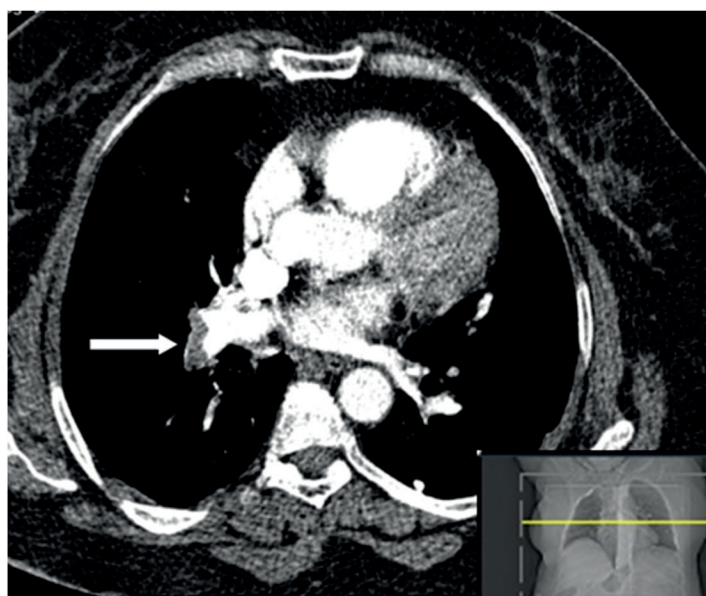


Figure 2. At the axial section of thorax computed tomography, the area consistent with thrombus that causes filling defects in the right main pulmonary artery is indicated by arrow.

clinical presentation of the patient, clinical decision rules (Table 2). DVT / PTE should be suspected when a postoperative patient complaints such as tachypnea, chest pain, pain and edema in the extremities, mental status changes and syncope. Echocardiography, electrocardiography, arterial blood gas measurement and contrast-enhanced spiral thorax CT may be useful to confirm the diagnosis [2]. Our patient also applied to the emergency department with complaints of shortness of breath, chest pain, sweating cold and a short-term syncope. Spiral CT shows thrombus in the main pulmonary arteries with 97% sensitivity [6]. In this case, a filling defect in the pulmonary arteries is shown with CT (Figure 2). Pulmonary arterial pressure increase (> 40 mmHg) and right heart failure were associated with PTE in echocardiography. Both findings were present in this case. Ventilation-perfusion scintigraphy and angiography are other diagnostic tests; however, for this patient they were not considered necessary. ECG and arterial blood gas are the leading diagnostic tests. $S_1Q_2T_3$, which is considered to be specific for PTE in ECG, can be seen in 12% of patients, although it is specific to the disease [7]. Sinus tachycardia and non-specific T wave changes are more common in the ECG. In this case, ECG was defined as $S_1Q_2T_3$ (Figure 1).

Table 1. Recommended DVT/PTE§ prophylaxis on the basis of risk factors in otolaryngology-head and neck surgery

Risk Factors		
Age(>40)	Prior major operation	Trauma
Age(>60) [¶]	Prior DVT/PTE [§]	Sepsis
Head and neck surgery	Obesity	Stroke
Operation time(>2 h)	Varicose veins	Pregnancy
Operation time(>6 h) [¶]	Immobilization	Cardiovascular disease
Malignancy($>T_2, N+$)	Estrogen therapy	Inherited
Risk Category	Definition	Prophylaxis
Low	2 risk factors	None or TED [‡] stockings
	3-5 risk factors	Kendall&TED [‡] stockings or LMWH [‡]
Moderate	Neurotologic operation	Kendall&TED [‡] stockings
	>5 risk factors	Kendall&TED [‡] stockings and LMWH [‡]
High	Microvasküler operation	Kendall&TED [‡] stockings and preoperative LMWH [‡]
§DVT=Deep venous thrombus, §PTE=Pulmonary thromboembolism, ¶= has a higher risk, ‡LMWH=Low molecular weight heparin, †TED=Thrombo-Embolus Deterrent		

If a patient develops hemodynamic instability because of PTE, this is defined as massive pulmonary thromboembolism (MPTE). Mortality in MPTE patients is about 30% ,and therefore aggressive treatment options are required. Although surgical embolectomy, catheter-directed intervention, and systemic thrombolysis are mostly available, surgical embolectomy and catheter-directed intervention are options that cannot be used in many centers. Systemic thrombolysis rapidly dissolves the clot and reduces mortality, but unexpected bleeding makes its clinical use controversial [8-10]. Generally, thrombolytic therapy is considered as contraindicated until 3 weeks after major surgery and trauma; however, there are also reports that it can be used after some surgeries [4]. Presence of intracranial hemorrhage, head trauma, ischemic stroke, previous neurosurgery, active bleeding, gastrointestinal bleeding in the last two weeks, pregnancy and

platelet count of less than 50000/mL are considered as definitive contraindications. Zhang et al. evaluated the patients who were diagnosed with postoperative MPTE and received thrombolytic therapy. They reported a 94% complete clinical improvement of MPTE but 29% of patients had mild hemorrhage at the surgical site and haematuria, [2]. In our case, severe bleeding started after the thrombolytic therapy and hematoma occurred in the surgical site; however, patient's MPTE recovered completely.

Table 2. Clinical decision rule for probability assessment of Pulmonary Embolism(PE)*

Rules	Points
Haemoptysis	1
Malignancy (receiving treatment, treated in the last 6 months, or receiving palliative treatment)	1
Tachycardia (heart rate > 100 beats/min)	1.5
Immobilization or surgery in the previous 4 weeks	1.5
Previous DVT/PTE	1.5
Clinical signs and symptoms of DVT (minimum of leg swelling and pain with palpation of the deep veins)	3
An alternative diagnosis is less likely than PE	3

*=Score ≤ 4 points means unlikely clinical probability of PE, and >4 points means a likely clinical PE probability, DVT=Deep venous thrombus, PTE=Pulmonary thromboembolism

Although DVT and PTE are rarely seen in otolaryngology practice, otolaryngologists should always keep in mind those complications since they have a high mortality rate.

Surgeons –if they do not want to encounter a thromboembolic complication such as DVT or PTE- they should first prevent the occurrence. Assessing the patients according to risk factors and to apply prophylaxis to high risk patients may further reduce the prevalence of DVT and PTE (Table 1). If such a complication occurs, systemic thrombolysis should be considered as soon as possible but the surgeon should also consider possible morbidities associated with bleeding at the surgical field. In conclusion, applying systemic thrombolytic therapy for thromboembolic complications after head and neck surgery is a controversy and requires new investigations for its reliability.

Conflict of interests

The authors declare that they have no competing interests.

Patient informed consent

Written consent form was obtained from the patient.

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References

- Moreano EH, Hutchison JL, McCulloch TM, et al. Incidence of deep venous thrombosis and pulmonary embolism in otolaryngology-head and neck surgery. *Otolaryngol Head Neck Surg*. 1998;118:777–84.
- Zhang K, Zeng X, Zhu C, et al. Successful thrombolysis in postoperative patients with acute massive pulmonary embolism. *Heart Lung Circ*. 2013;22:100-3.
- Kearon C, Kahn SR, Agnelli G, et al. Antithrombotic therapy for venous thromboembolic disease: American College of Chest Physicians evidence-based clinical practice guidelines-8th edition. *Chest*. 2008;133:454–545.
- Ah-See KW, Kerr J, Sim DW. Prophylaxis for venous thromboembolism in head and neck surgery: the practice of otolaryngologists. *J Laryngol Otol*. 1997;111:845–9.

5. Ota M, Nakamura M, Yamada N, et al. Prognostic significance of early diagnosis in acute pulmonary thromboembolism with circulatory failure. *Heart Vessels*. 2002;17:7–11.
6. Van Belle A, Buller HR, Huisman MV, et al. Effectiveness of managing suspected pulmonary embolism using an algorithm combining clinical probability, d-dimer testing, and computed tomography. *JAMA*. 2006;295:172–9.
7. Sakuma M, Konno Y, Shirato K. Increasing mortality from pulmonary embolism in Japan 1951–2000. *Circ J*. 2002;66:1144–9.
8. Buller HR, Agnelli G, Hull RD, et al. Antithrombotic therapy for venous thromboembolic disease: the seventh ACCP conference on antithrombotic and thrombolytic therapy. *Chest*. 2004;126:401–28.
9. Wan S, Quinlan DJ, Agnelli G, et al. Thrombolysis compared with heparin for the initial treatment of pulmonary embolism: a meta-analysis of the randomized controlled trials. *Circulation*. 2004;110:744–9.
10. Daley MJ, Lat I. Clinical controversies in thrombolytic therapy for the management of acute pulmonary embolism. *Pharmacotherapy*. 2012;32:158–72.