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A Case of Intraoperative Pulmonary Embolism in a Very Elderly Patient Who Showed Typical Clinical Signs and Could Not Be Saved

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Abstract

Artificial head replacement was performed for a left femoral neck fracture in a 90-year-old woman. A decrease in SpO2 and EtCO2 was observed before surgery. Although catecholamines and anti-blood medicines were administered, it was difficult to save the patient's life. If there are facility limitations, it is necessary to transfer the patient to another hospital as soon as possible to save a life.

Keywords: Pulmonary Embolism, Emergency, antithrombotic therapy

Introduction

The latest survey results on pulmonary embolism by the Japanese Society of Anesthesiologists show that the number of registered cases is increasing, but the mortality rate is decreasing. The establishment of the Society of Anesthesiologists' Practical Guide and Pulmonary Embolism Guidelines is thought to be a major factor in reducing the mortality rate. Here, we experienced an intraoperative pulmonary

thromboembolism with typical clinical signs and laboratory findings during prosthetic head replacement for a femoral neck fracture in a very elderly patient. Despite treatment according to guidelines, the embolism was massive and life-saving was difficult. We responded to this case and considered future treatments.
There are no conflicts of interest.

[Case]
Female, 90s, 145cm , 59kg
[Past history] Ascending colon cancer (surgery), abdominal wall scar hernia, lumbar scoliosis, esophageal hiatal hernia, uterine fibroids (surgery), cataracts [Oral history] Sennoside, candesartan, amlodipine, Magmit, Mucosta
[Life history] No smoking, No drinking, No allergies
[Present history] Slipped on the tatami and fell, causing a bruise to the left hip joint. The patient was rushed to our hospital because he had difficulty moving due to pain in the same area. Xp revealed a left femoral neck fracture of Garden type 1 . Since the patient was completely independent in ADL , we performed traction with an interventional assistant, and 5 days after the injury, we performed artificial femoral head replacement under general anesthesia. A preoperative examination for anesthesia was performed the day before surgery to confirm that there were no problems with the patient's general condition.

[Anesthesia, surgical progress]
General biological monitoring was performed, and although SpO2 was low at 90 % upon entering the room, it rose to 100 % when a mask was gently placed on oxygen at 6L/min to encourage breathing, and remifentanil, propofol, and rocuronium were administered throughout the body. Anesthesia induction began. No abnormalities were observed in vital signs other than
SpO2 . After tracheal intubation, SpO2 remained at around 94-97 %, but EtCO2 was low at 27-33 mmHg . Blood pressure and heart rate were stable, and after administration of anesthesia, surgery was started in the lateral position. During the surgery, vital signs were generally stable, but EtCo2 remained low.
At the time of wound closure, systolic blood pressure suddenly decreased to 60 mmHg and EtCO2 to 15 mmHg . Although SpO2 was 100 %, transthoracic echocardiography (Fig. 1) showed evidence of right ventricular overload, so we suspected pulmonary thromboembolism and informed the surgeon, who administer-

ed 100 % oxygen, fluid overload, and phenylephrine and norepinephrine. I did it. Since the wound was about to close, the surgery was completed as soon as possible, the patient was contacted by the cardiology department, the patient was repositioned, and Aline and CV catheters were inserted. The electrocardiogram at this time was as shown in Figure 2, and showed right axis deviation and right ventricular overload. Blood pressure continued to be low, and adrenaline was administered. Anticoagulant therapy with systemic heparin was also started. With continuous administration of epinephrine, the systolic blood pressure decreased to approximately 80 mmHg.

Figure 1. Transthoracic echocardiography (Recognize Dshape and Mc Connell signs.)

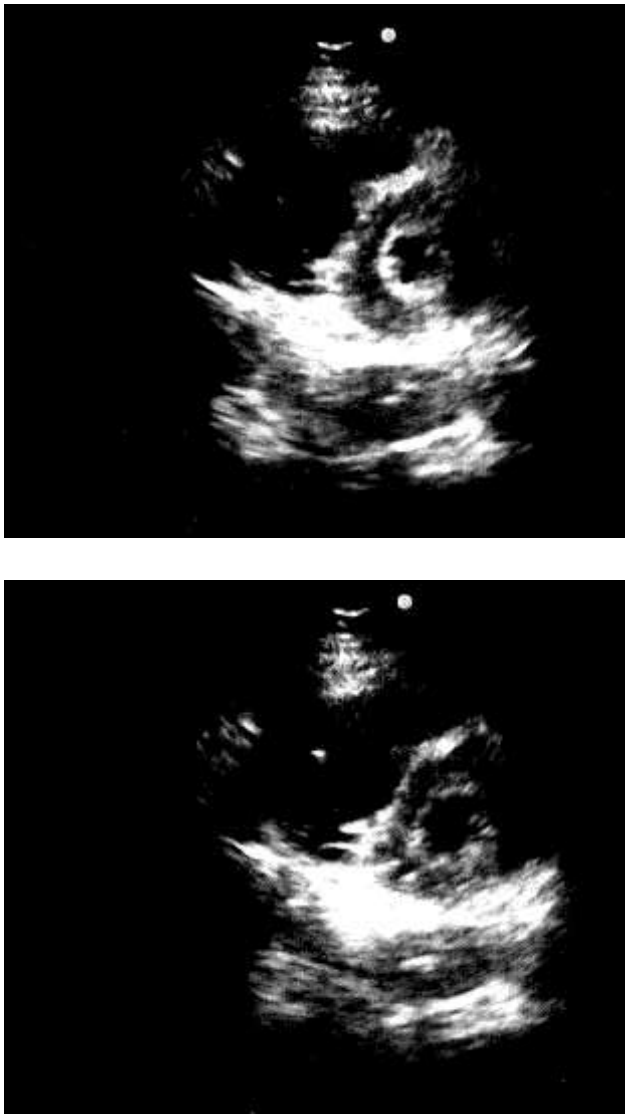
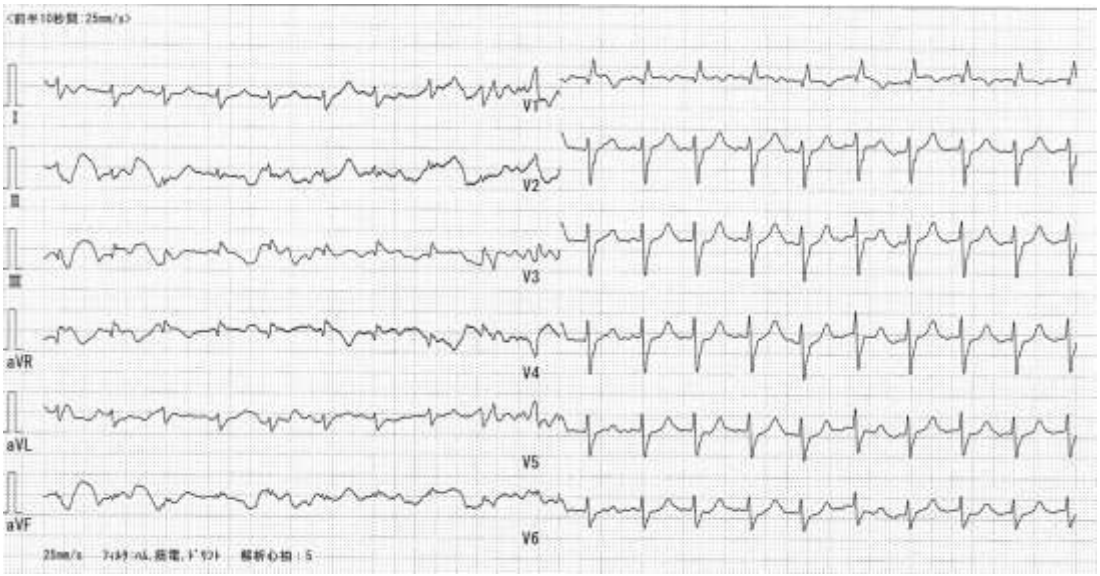


Figure 2. 12- lead electrocardiogram (Found findings of right axis deviation, clockwise rotation, and right ventricular load)



[Postoperative progress]

Postoperative CT scan revealed thromboembolism at the bifurcation of both pulmonary arteries. **Figure 3**

Postoperatively, respiratory management, continuous administration of catecholamines, and tPA therapy (Monteplase 13,750 IU/Kg) were performed in the ICU . Introduction of A-VECMO at our hospital and catheter-based thrombectomy were considered, but these were difficult due to institutional and human factors. Transport to another hospital was considered, but the arterial systolic blood pressure was approximately 50-70 mm Hg, and transport was deemed dangerous.

The family requested that the patient receive as much treatment as possible at our hospital under IC, and we continued to provide respiratory support, anticoagulant therapy, and catecholamine support. There was no increase in blood pressure, and the patient passed away 12 hours after the surgery.

Discussion

There are several points that should be reflected on in this case. ① Even though 5 days had passed since the injury, lower limb echocardiography and Ddimer tests were not performed. ② By lowering SpO2 upon entering the room and applying a mask firmly, we could have measured EtCO2 under spontaneous breathing and

before induction of anesthesia, and could have detected the possibility of pulmonary embolism. By measuring PaO2, it may be possible to determine true hypoxemia and to differentiate the disease causing it. ③ If there was any suspicion of pulmonary embolism, even if general anesthesia had been induced, the patient should have been awakened and the surgery should have been performed after careful examination. ④ Physiological function tests were conducted after changes in vital signs occurred, but they were able to be conducted immediately after the introduction of the system. ⑤ Although it was difficult to introduce A-VECMO due to institutional and human factors, we were able to maintain hemodynamics with catecholamines and other support for 12 hours after surgery, so it may have been possible to transfer the patient to another hospital.

Recent reviews have listed pulmonary thromboembolism as the first choice treatment. [2]

Percutaneous catheter therapy has many complications and is difficult to perform at our hospital.

For pulmonary thromboembolism, preoperative diagnosis and preventive intervention are the most important, so we will be creating preventive protocols in the future.

Conclusion

A patient experienced a pulmonary thromboembolism with typical clinical signs that could not be saved during surgery.

If there are limits to the treatment strategy available at the hospital, it is necessary to make an early decision to transfer the patient to another hospital while trying to stabilize the circulatory system. Preventive intervention is also important.

References

[1] Masaaki Ito et al., Guidelines for Diagnosis, Treatment and Prevention of Pulmonary Thromboembolism and Deep Vein Thrombosis (JCS2017), https://js-phlebology.jp/wp/wp-content/uploads/2019/03/JCS2017_ito_h.pdf

[2] Dieuwke Luijten et al., Clinical controversies in the management of acute pulmonary embolism: evaluation of four important but controversial aspects of acute pulmonary embolism management that are still subject of debate and research, *Expert Review of Respiratory Medicine*, (2023), 181-189. https://doi.org/10.1080/17476348.2023.2190888

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