

ACUTE PULMONARY EMBOLISM FOLLOWING LAPAROSCOPIC OVARIECTOMY: A CASE REPORT

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Laparoscopic surgery is usually considered to be less invasive when compared to traditional laparotomy, and is regarded as a relatively low-risk procedure for postoperative complications because of the reduced surgical stress and earlier mobilization. However, we describe a 47-year-old woman who presented with acute respiratory distress, drowsy consciousness, and circulatory collapse shortly after gynecologic laparoscopic ovariectomy for removing an ovarian teratoma at a local hospital. After resuscitation, the patient was transferred to our emergency department. Immediate bedside electrocardiographic and echocardiographic examination results led to acute pulmonary embolism being quickly diagnosed. The patient received subsequent intensive care with smooth course. Although pulmonary embolism is rare after laparoscopic surgery, early detection and quick treatment are important in the management of this life-threatening complication and offer good prognosis. The risk of pulmonary embolism after gynecologic laparoscopic surgery remains unclear. Therefore, the decision to provide prophylaxis is up to the individual physician, and should take into consideration the patient's individual risk factors and comorbidities.

Key Words: complication, laparoscopic surgery, pulmonary embolism
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Laparoscopic surgery has been widely used in many surgical fields, including in the management of hepatobiliary, digestive, urologic, and gynecologic disorders [1]. Laparoscopic surgery is usually considered to be a relatively low-risk procedure for postoperative complications because of the reduced surgical stress and earlier mobilization. However, since the first case report of pulmonary embolism following laparoscopic cholecystectomy [2], a growing number of reports of thromboembolic complications in association with laparoscopic surgery, mostly cholecystectomy, have

been published in the last decade [3–8]. Nevertheless, pulmonary embolism remains rare after laparoscopic surgery, and it is even rarer in the field of gynecologic laparoscopy [9,10]. We describe a case of pulmonary embolism that presented as acute respiratory distress and hemodynamic collapse, which occurred after gynecologic laparoscopic surgery for the removal of a right ovarian teratoma.

CASE PRESENTATION

A 47-year-old woman in an apparently healthy condition was admitted to a local gynecologic hospital for the removal of a right ovarian teratoma. She was 1.63 m tall, weighed 56 kg, and had a body mass index of 23.8 kg/m². She had no history of previous abdominal surgery. The results of preoperative chest X-ray and

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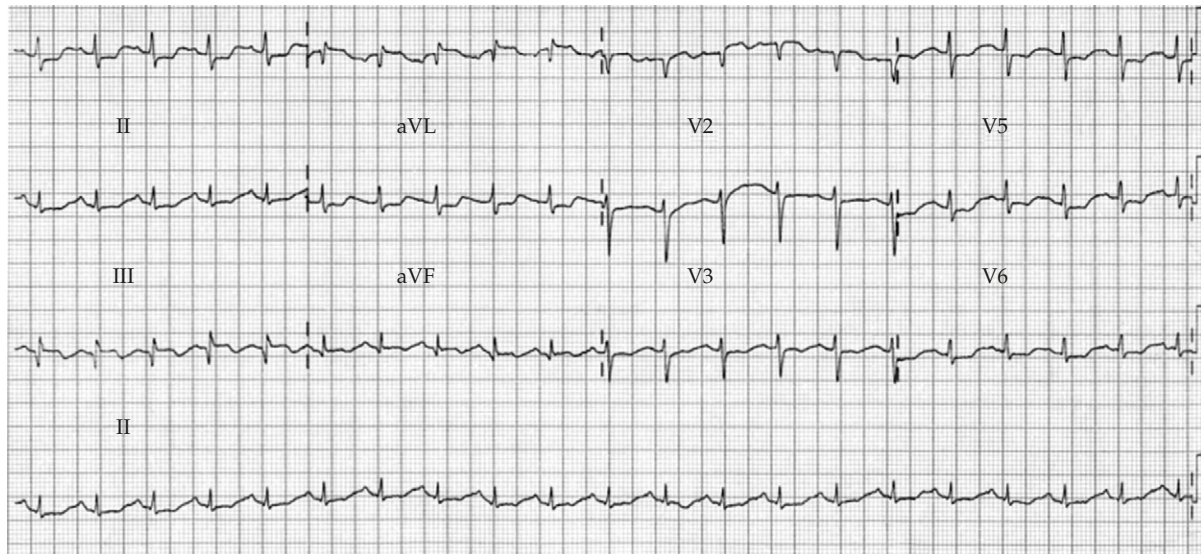


Figure 1. Standard 12-lead surface electrocardiography on admission shows sinus tachycardia and typical $S_1Q_3T_3$ pattern over leads I and III, by which pulmonary embolism was suspected.

surface 12-lead electrocardiogram (ECG) were normal. She underwent laparoscopic ovariectomy. The course was smooth with minimal blood loss, and the operation was successfully completed within 70 minutes. However, the day after the operation, the patient collapsed as she walked three steps toward the bathroom, where she was found, dyspneic. Oxygen and intravenous fluid were administered. Two hours later, dyspnea and respiratory distress worsened, with concurrent loss of consciousness, upward gaze, and seizure-like movement of both arms. Endotracheal intubation and cardiopulmonary resuscitation were performed immediately. Her consciousness recovered within 30 minutes and she was subsequently extubated. However, shortness of breath and O_2 desaturation (SpO_2 , 70%) were noted 2 hours later. Intravenous furosemide 80 mg was given for wheezing, which was perceived as presentation of acute pulmonary edema. Recurrent respiratory distress necessitated intubation again, and the patient was immediately transferred to our emergency department by ambulance for further intensive management.

The patient presented at our emergency department with E4VEM6, blood pressure 103/55 mmHg, heart rate 122 bpm, and a body temperature of 35.4°C. The complete blood cell counts showed leukocytosis (white blood cell count, 22,890/ μ L; neutrophils, 77.1%). Arterial blood gas showed mixed respiratory and metabolic acidosis. The biochemical profiles showed abnormal liver function (AST 529 U/L, ALT 466 U/L)

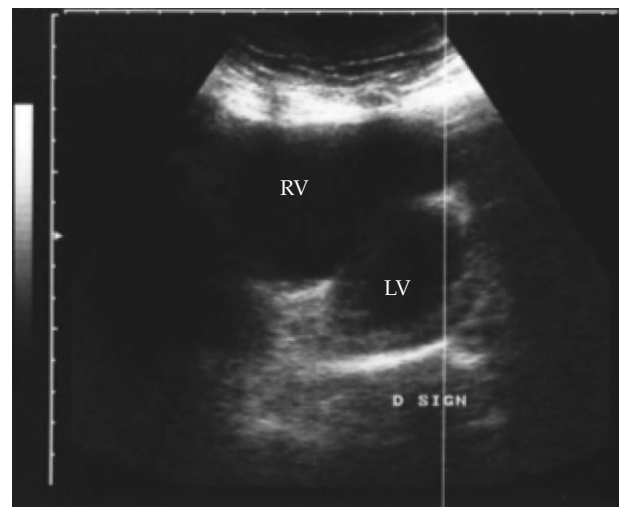


Figure 2. Bedside two-dimensional echocardiography shows dilatation of the right ventricle (RV) and paradoxical septal wall motion with the interventricular septum shifting into the left ventricle (LV) during diastole.

and coagulopathy (PT p/c: 17.1/12.0; INR, 2.13; aPTT p/c: 71.2/28.8). Standard 12-lead ECG showed sinus tachycardia with diffuse ST-segment depression over limb leads I and aVL and precordial leads V3–V6, and typical $S_1Q_3T_3$ pattern over leads I and III was also noted (Figure 1). Bedside two-dimensional echocardiography showed dilatation of the right ventricle with shift of the interventricular septum into the left ventricle during diastole, and paradoxical septal wall motion (Figure 2). Significant tricuspid regurgitation with

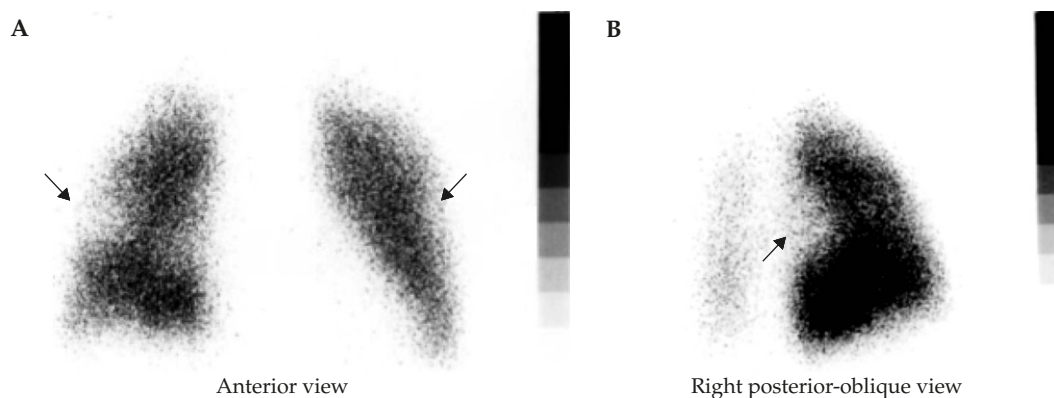


Figure 3. Lung perfusion scintigraphy shows a wedge-shaped defect (arrows) indicating pulmonary embolism in the superior segment of the right lung and subsegmental perfusion defects in the superior segment of the left lung 3 days after laparoscopic ovariectomy.

estimated pressure gradient up to 45 mmHg was noted on continuous width Doppler and color echocardiography. Under the impression of suspicious pulmonary embolism, D-dimer assay was performed, and anticoagulation therapy with continuous intravenous administration of unfractionated heparin (10,000 U/day) was initiated; the patient was then transferred to the intensive care unit (ICU) for further intensive monitoring and management. The D-dimer assay using latex agglutination was reported up to 5,890 $\mu\text{g/L}$. The blood test for antiphospholipid antibody was negative. Successful ventilator weaning and extubation were performed after 1 day of coronary unit care. Technetium-99m macroaggregated albumin pulmonary perfusion and technetium-99m DTPA aerosol ventilation scintigraphy the next day showed a wedge-shaped perfusion defect in the superior segment of the right lung, and subsegmental perfusion defects in the superior segment of the left lung. Ventilation and perfusion (V/Q) mismatch lesions were found in bilateral lung fields and pulmonary embolism was diagnosed (Figure 3). Overlapping therapy with oral warfarin 2.5 mg/day was started for gradual tapering of intravenous heparin after day 3. No evidence of deep vein thrombosis was found in the subsequent duplex ultrasound examination of her lower extremities at that time. The patient recovered and was discharged without discomfort on the 5th postoperative day. Liver function tests were normal after day 5. Oral anticoagulant therapy was discontinued 3 months later. No recurrence of pulmonary embolism was found during 1½ year's follow-up in the outpatient clinic.

DISCUSSION

We described a rare case of pulmonary embolism that presented as sudden circulatory collapse following gynecologic laparoscopic surgery for the removal of an ovarian teratoma. After initial successful resuscitation, the patient was quickly recognized and suspected to be a victim of pulmonary embolism by the typical findings of right ventricular strain ($S_1Q_3T_3$ pattern) on surface 12-lead ECG and bedside transthoracic echocardiography [11]. The diagnosis of pulmonary embolism was further confirmed by the extremely high D-dimer value (5,890 $\mu\text{g/L}$) and by subsequent V/Q mismatch demonstrated on radio-nuclide scintigraphy. Early anticoagulation therapy with unfractionated heparin, followed by oral warfarin, was given, and the patient experienced a smooth course in the ICU and was discharged.

Laparoscopic surgery is generally considered to be a low-risk procedure because of a low rate of postoperative complications [1]. However, the increased incidence of deep vein thrombosis and pulmonary embolism following laparoscopic cholecystectomy from previous case reports have attracted attention because they are potentially fatal complications [2–5]. The increased intraabdominal pressure [6], increased ventilatory pressure [7], reverse-Trendelenburg position, and the vasodilatory effects of hypercarbia with general anesthesia [8] during laparoscopic surgery are possible risk factors, which may enhance venous stasis of the lower extremities.

Our review of the literature found only two previous case reports of thromboembolism episodes related

to gynecologic laparoscopic surgery. Mehra et al reported one case complicated with pulmonary embolism after laparoscopic extraperitoneal paraaortic lymphadenectomy from among their patients with gynecologic malignancies [9]. Hsieh et al reported a rare case of sudden cardiac death in the immediate postoperative period after laparoscopic hysterectomy [10]. A prospective survey of patients undergoing gynecologic laparoscopy reported that the estimated incidence of symptomatic postoperative pulmonary embolism was only 0.02% [4]. The common symptoms of pulmonary embolism such as chest pain, cough, apprehension, dyspnea, tachycardia, and hypotension can be masked in unconscious patients or patients who are still under the influence of anesthesia. Pulmonary embolism can be fatal, and may occur without any warning sign and present as sudden cardiac collapse. Therefore, it should be kept in mind that pneumoperitoneum may interfere with venous flow in the lower extremities and predispose patients to deep vein thrombosis or pulmonary embolism during or soon after laparoscopic procedures.

Laparoscopic surgery can bring about less patient discomfort and is regarded as a less invasive procedure than traditional open approach. However, the possibility of developing thromboembolism following laparoscopic surgery should be kept in mind. The predictive parameters of pulmonary embolism after gynecologic laparoscopic surgery remain unclear [12]. The decision as to whether or not to provide prophylactic treatments (for instance, low-dose heparin prophylaxis, graduated compression stockings, or intermittent pneumatic compression of the legs) should be individualized according to patients' risk factors and comorbidities. For example, patients with varicose veins and a history of thromboembolism may have aggravated laparoscopy-associated risks for the development of thromboembolic complications [13]. Early recognition and prompt management are essential for good prognosis for this rare but life-threatening complication after laparoscopic surgery.

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腹腔鏡卵巢切除術後併發急性肺栓塞 — 病例報告

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腹腔鏡手術一般被認為比起傳統外科手術具有較低的侵襲性，由於對於病人所產生的手術壓力較低以及病人可以早期活動，腹腔鏡手術在術後發生併發症的機率也相對較少。本文描述一位四十七歲女性，被診斷患有卵巢畸胎瘤，在外院接受完婦科腹腔鏡卵巢切除術數小時後，發生呼吸急促、意識不清與循環休克之現象。在經急救後穩定住病情，隨即轉往本院急診，藉著床邊心電圖以及心臟超音波，高度懷疑急性肺栓塞之可能性並立即轉入加護病房穩定住其病情。雖然臨床上腹腔鏡手術後發生急性肺栓塞的機率並不高，但是對於此高致命性的併發症必須仰賴早期正確的診斷與積極的治療才能改善病人的預後。目前能夠評估婦科腹腔內視鏡術後發生急性肺栓塞的危險因子仍然沒有定論。因此對於術前的預防措施，都是根據病人個別的危險因子以及其他合併的臨床病情來考慮施予。

關鍵詞：併發症，腹腔內視鏡手術，肺栓塞

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