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PULMONARY EMBOLISM: A RECURRENT NIGHTMARE FOLLOWING LAPAROSCOPIC SURGERY – A CASE REPORT AND REVIEW

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ABSTRACT

Background: Pulmonary embolism (PE) is a potentially fatal condition and a leading cause of preventable postoperative mortality. While laparoscopic procedures are considered minimally invasive, emerging evidence suggests a persistent risk of thromboembolic complications. **Case Presentation:** A 49-year-old woman admitted to the Obstetrics and Gynecology ward underwent total laparoscopic hysterectomy with bilateral salpingectomy. On postoperative day 2, she developed acute dyspnea, hypoxia, and tachycardia. Clinical suspicion of PE was confirmed using CT pulmonary angiography. Prompt anticoagulation therapy resulted in complete recovery. **Conclusion:** Pulmonary embolism may occur even in low-risk individuals following laparoscopic surgery. Early recognition, timely imaging, and prompt anticoagulation are essential to improve outcomes.

KEYWORDS: Pulmonary embolism, Venous thromboembolism, Laparoscopic hysterectomy, Postoperative complications, Anticoagulation.

INTRODUCTION

Pulmonary embolism (PE) represents a severe and potentially fatal manifestation of Venous thromboembolism and remains a significant cause of morbidity and mortality in hospitalized patients.[1,2] It results from obstruction of the pulmonary arterial circulation, most commonly due to embolization of thrombi from the deep venous system of the lower limbs.[2,3] Despite advances in diagnostic and therapeutic strategies, PE continues to pose a diagnostic challenge due to its variable and often nonspecific clinical presentation.[11]

The pathophysiology of thromboembolism is classically explained by Virchow's triad, which includes venous stasis, endothelial injury, and a hypercoagulable state.[3,12] Surgical procedures significantly contribute to these factors through tissue trauma, immobilization, and inflammatory responses.[4]

Minimally invasive laparoscopic surgeries have gained widespread acceptance due to advantages such as reduced postoperative pain, shorter hospital stay, and early mobilization. These benefits initially led to the perception that laparoscopic procedures carry a lower risk of thromboembolism compared to open surgeries.[5] However, accumulating evidence suggests that laparoscopic procedures are not devoid of risk.

The creation of pneumoperitoneum using carbon dioxide increases intra-abdominal pressure, leading to reduced venous return and venous stasis. Additionally, hypercarbia-induced vasodilation, reverse Trendelenburg positioning, and prolonged operative duration may further predispose patients to thrombus formation.[5,6] Recent reports have documented cases of pulmonary embolism following laparoscopic gynecological procedures, including hysterectomy and adnexal surgeries.[6-8]

Furthermore, the role of perioperative pharmacological agents such as tranexamic acid and the debate surrounding routine thromboprophylaxis in minimally invasive procedures highlight the complexity of risk assessment.[10] Studies evaluating prophylactic anticoagulation in laparoscopic hysterectomy patients suggest that thromboembolic risk persists and should not be underestimated.[9]

Early diagnosis of PE remains critical but challenging. CT pulmonary angiography is currently considered the gold standard for diagnosis due to its high sensitivity and specificity.[1]

This case report aims to emphasize the occurrence of pulmonary embolism in a low-risk patient following laparoscopic hysterectomy and underscores the importance of early recognition and individualized thromboprophylaxis strategies.

CASE PRESENTATION

A 49-year-old woman was admitted to the Obstetrics and Gynecology ward of Rama Medical College with complaints of heavy menstrual bleeding for two months. She had no significant past medical or surgical history and no known risk factors for thromboembolism. Her body mass index was 23.5 kg/m².

Preoperative evaluation, including complete blood investigations and echocardiography, was within normal limits. The patient underwent total laparoscopic hysterectomy with bilateral salpingectomy and adhesiolysis under general anesthesia. The duration of surgery was approximately 4.5 hours, and the intraoperative period was uneventful with minimal blood loss.

On postoperative day 2, the patient developed sudden onset breathlessness while ambulating, which progressively worsened and was associated with chest tightness even at rest. On examination, she was tachypneic and hypoxic.

Vital parameters were.

- Pulse rate: 116 beats/min
- Blood pressure: 110/70 mmHg
- Oxygen saturation: 88% on room air
- Respiratory rate: 30 breaths/min

Electrocardiogram revealed sinus tachycardia with nonspecific ST-T changes. Laboratory investigations showed mildly elevated NT-proBNP levels, while Troponin I and CPK-MB were within normal limits.

Bedside echocardiography demonstrated right ventricular dilatation, suggestive of right heart strain. Elevated D-dimer levels further increased the suspicion of pulmonary embolism. The diagnosis was confirmed by CT pulmonary angiography.[1,2]

Management and Outcome

The patient was immediately started on anticoagulation therapy with low molecular weight heparin along with oxygen support and supportive care. Duplex ultrasound of the lower limbs did not reveal any evidence of deep vein thrombosis.

The patient showed gradual clinical improvement over the next few days. She was discharged on oral anticoagulant therapy, which was continued for three months in accordance with established guidelines.[4]

Follow-up over a period of 10 months showed complete recovery with no recurrence of symptoms.

DISCUSSION

Pulmonary embolism remains a significant postoperative complication despite advancements in surgical techniques. Although laparoscopic surgeries are associated with reduced morbidity, the risk of thromboembolism persists.[5-7]

In this case, the patient had no conventional risk factors, highlighting the importance of procedure-related factors. Pneumoperitoneum increases intra-abdominal pressure, leading to venous compression and reduced venous return. Hypercarbia further contributes to vasodilation and circulatory changes. Prolonged operative duration exacerbates these effects, promoting venous stasis.[5-6]

These mechanisms align with Virchow's triad and play a central role in thrombus formation.[3,12] Similar cases reported in literature, including ovarian vein thrombosis and pulmonary embolism following gynecological procedures, support these findings.[7,8]

Interestingly, no deep vein thrombosis was detected in this patient. This observation has been reported in previous studies and suggests the possibility of thrombus formation in situ or embolization from undetected sources.[6]

The clinical presentation of PE can be subtle and nonspecific, making early diagnosis challenging. In this case, a combination of clinical suspicion, elevated biomarkers, echocardiographic findings, and confirmatory CT pulmonary angiography facilitated timely diagnosis.

Prompt initiation of anticoagulation therapy is crucial and significantly reduces mortality.[4] Current guidelines recommend individualized thromboprophylaxis based on patient risk factors and procedural characteristics.[9] The potential role of perioperative agents such as tranexamic acid in increasing thromboembolic risk should also be considered.[10]

CONCLUSION

Pulmonary embolism can occur even after minimally invasive laparoscopic procedures in patients without identifiable risk factors.

- Maintain a high index of suspicion in postoperative patients
- Early diagnosis using appropriate imaging is essential
- Prompt anticoagulation therapy improves survival
- Thromboprophylaxis should be individualized

Early recognition and timely management are critical in preventing life-threatening outcomes.

Declarations

Ethical Approval: Not required for case report (as per institutional policy).

Consent: Informed written consent was obtained from the patient.

Conflict of Interest: None declared.

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