

# Massive Pulmonary Embolism Post Sleeve Gastrectomy Treated with Systemic Thrombolytic: A Case Report

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## Key Clinical Message

Prompt diagnosis and management of massive pulmonary embolism after bariatric surgery is crucial, but thrombolytic therapy may increase the risk of complications such as anastomotic leakage and bleeding. Individualized management is needed.

**Keywords** : Pulmonary embolism, sleeve gastrectomy, bariatric surgery, thrombolytic, alteplase

## Introduction

Perioperative Deep Vein Thrombosis and Pulmonary embolism (PE) occur in up to 5.4% and 6.4% of bariatric surgeries, respectively [1-4]. Although uncommon, these complications are potentially life-threatening and are considered significant causes of mortality in bariatric surgery candidates [5].

Due to lack of evidence, diagnostic and therapeutic approaches in fragile post-operative settings are as crucial as uncertain. These complications are not common; thus, in the event that they occur, physicians may be unrehearsed. Therefore, detailed discussion and sharing experiences are of great importance. Here we present a real case of acute massive PE after laparoscopic sleeve gastrectomy.

## Case presentation

37 years old Iranian female, a known case of hypothyroidism and class III obesity, admitted to our hospital for laparoscopic gastric sleeve surgery (150 cm, 95 kg, and BMI: 42.2 kg/m<sup>2</sup>). She had a previous surgical history of three caesarian sections; the last one was almost 7 years earlier than this admission. She was on levothyroxine and metformin (self-prescribed in order to lose weight) and did not use birth control. She had no family history of inheritable coagulopathies, and her social history was unremarkable.

Laboratory and clinical pre-operative evaluations were unremarkable, including anesthesia, endocrinology, and cardiology. For thromboprophylaxis, compression stockings were applied, and she received a single dose (5000 IU) of subcutaneous heparin one hour before the surgery, according to the local guidelines. Her operation was uneventful, and sleeve gastrectomy was conducted in 100 minutes with six 60 mm purple endostaplers. At the end of the surgery, a Jackson-Pratt (JP) drain was inserted at the surgery site. She recovered, returned to the ward, and prophylactic enoxaparin (60 mg/day subcutaneously) started within 6 hours after surgery. The patient was ambulated as soon as she became conscious and hemodynamically stable. The first post-operative night was uneventful, but she fainted the next morning after ambulation. She was tachycardic (pulse rate 140 bpm) and hypotensive (systolic blood pressure 80 mmHg). JP drain did not contain bloody discharge. After primary resuscitation, considering myocardial infarction, anastomotic leakage, and PE as top differential diagnoses, the following evaluations were initiated:

- Abdominopelvic sonography: minimal free fluid in the abdominal cavity
- Echocardiography: dilated right ventricle and atrium (pulmonary acceleration time: 60 msec)
- Spiral Computed Tomography (CT) scan of abdomen and pelvis with Intravenous contrast: (1) liver slightly edematous, which could be due to right side heart failure, and (2) mild free fluid in the abdominopelvic cavity
- Spiral CT Angiography of pulmonary vessels with contrast (PE protocol): multiple filling defects in the bifurcation of main bilateral pulmonary arteries which extended to segmental and lobar branches of both sides (confirmatory of massive PE) (Figure)

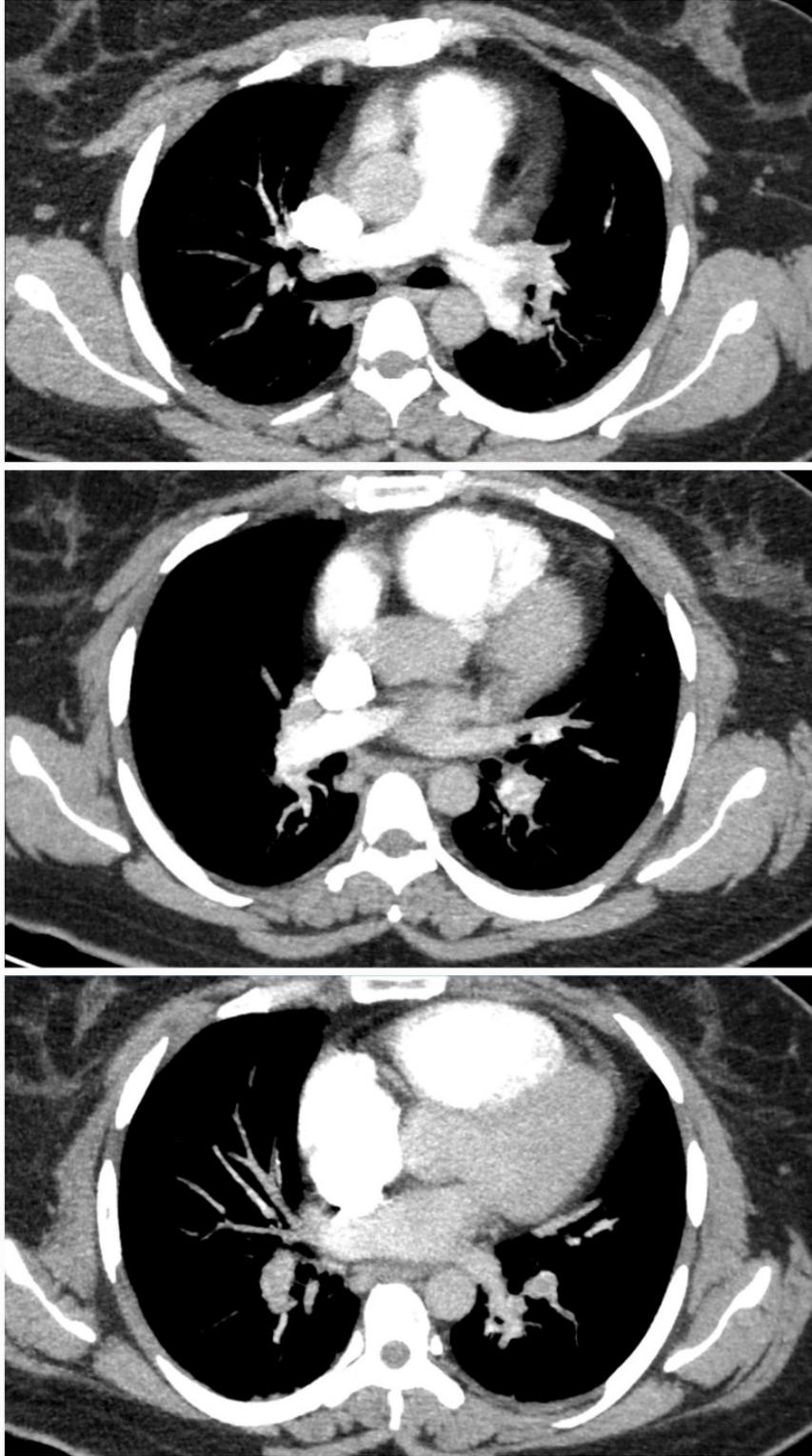


Figure 1

By counseling the cardiac surgery team, we decided that surgical thrombectomy would not benefit the patient. Therefore, the patient was transferred to the intensive care unit. After consulting with vascular surgery and cardiology teams, we started alteplase (100 mg continuous intravenous infusion over two hours) with caution. The patient went under close observation, including abdominopelvic sonography (for early detection of intraabdominal leakage or bleeding), echocardiography, neurologic examinations, and laboratory follow-ups. One hour after alteplase, her JP drain started to discharge blood (about 2 liters in the first 24 hours) along with bloody vaginal discharge, needing 3 bags of packed cells and 3 bags of fresh frozen plasma to be transfused. Although she initially was actively bleeding, it significantly decreased over the next four days. On Post-Operative Day (POD) 4, she became hemodynamically stable with a normal abdominal exam and tolerated the diet. Thereafter, we started therapeutic heparin (800 IU/hour continuous intravenous infusion) for three days. On the 7th POD, the bleeding stopped, and she was transferred to the surgery ward, where we switched from heparin to rivaroxaban (15 mg twice daily). Then, she was observed for a day and discharged from the hospital.

The medical team followed her after discharge until the submission of this paper (8 months). She experienced an uneventful post-operative period while losing 40 kg of her weight. On follow-ups, she developed iron deficiency anemia, which is being treated with intravenous iron supplements. Hematologic evaluations for thrombotic tendencies, including factor V Leiden, protein C, and protein S were all unremarkable.

## Discussion

Candidates for bariatric surgery naturally amass multiple risks of thrombotic events. They suffer from obesity, chronically venous insufficiency, a recent surgery, and usually are less physically active [6]. On the other hand, although these thromboembolic events are not common, they are highly detrimental and mostly present in the first 30 post-operative days [2, 7, 8]. Nevertheless, unfortunately, there is not yet an established global consensus on thromboprophylaxis in these patients. The literature lacks an optimum drug, dosage, and duration for pharmacologic thromboprophylaxis.

The presentation of PE is unspecific, which makes it difficult to diagnose. In this condition, the most important differential diagnoses in patients undergoing bariatric surgery are post-operative bleeding, anastomotic leakage, and myocardial infarction. Differentiation between these diagnoses is highly time-sensitive. In our case, we decided to include spiral abdominopelvic CT scan, spiral CT angiography, abdominopelvic ultrasonography, and echocardiography. We believed these evaluations would help narrow the differential diagnosis as quickly as possible. Then, we followed the therapeutic effects and potential adverse events by daily follow-ups with abdominopelvic ultrasonography and echocardiography.

Massive PE is a serious complication and requires rigorous treatment. Careful clinical assessment must include proper risk stratification since it will influence both diagnostic and therapeutic decision-making. Administration of systemic thrombolytics has been shown to resolve symptoms rapidly [9]. However, systemic thrombolytics are controversial in bariatric surgery patients due they can adversely cause life-threatening complications such as anastomotic leakage and intraabdominal bleeding; therefore, it is considered relatively contraindicated [6]. Considering the debate mentioned earlier, massive PE appears to be a significant challenge to manage in bariatric surgery post-operative settings. However, considering the potentially fatal outcome of massive PE, we decided to take the risk of systemic thrombolytic, which was beneficial to the patient

## Conclusion

PE is uncommon in patients who undergo bariatric surgery, but if left untreated, it increases mortality risk and long-term morbidity. On the other hand, systemic thrombolytic administration as a standard therapeutic approach is considered relatively contraindicated in massive PE that occurs shortly after surgery. Until

the development of sufficient evidence, it is reasonable to approach thromboembolic events based on the individual and medical team's discretion.

## Figure legend

Figure 1: Multiple filling defects in bifurcation of the main bilateral pulmonary arteries which extends to segmental and lobar branches in favor of massive PE.

## Conflict of interest

N. Moeinvaziri, N. Haghighi, and A. Sadeghi have no conflict of interest to declare.

## Authors' contribution

N.M. and A.S. conceived and designed the study. A.S. gathered the data from the patient. A.S. drafted the manuscript and N.M. revised and confirmed the manuscript.

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