

## CASE REPORT

# Pulmonary Thromboembolism While Receiving Tranexamic Acid after Laparotomy Myomectomy: A Case Report

Shahla Noori Ardabili<sup>1</sup>, Atefeh Zeinali<sup>2</sup>, Rajneesh Kumar Mishra<sup>3</sup>, Samaneh Chegeni<sup>4</sup>, Ali Mehrafshar<sup>5</sup>, Nooshin Noori<sup>6</sup>

Received on: 21 February 2022; Accepted on: 20 May 2022; Published on: 05 September 2023

### ABSTRACT

**Aim:** We aimed to review a case with pulmonary thromboembolism while using tranexamic acid after laparotomy myomectomy.

**Background:** Pulmonary embolism (PE) is life-threatening and early diagnosis and proper treatment are crucial.

**Case description:** This case was a middle-aged healthy and active woman that referred to our gynecology clinic due to menometrorrhagia and dysmenorrhea. According to an ultrasound report, she had an enlarged myxomatosis uterus. Medical treatment did not work therefore she chose the surgery. During surgery due to massive blood loss, 1 gram of tranexamic acid was infused two packed cells were transfused. After 48 hours of the surgery, the patient complained of shortness of breath. More evaluations showed PE. The patient had no thromboembolism risk factors. It seemed that tranexamic acid caused thrombosis in this patient. After proper treatment measures such as anticoagulant medicines, she was discharged from the hospital.

**Clinical significance:** Considering the risk of thrombosis in each case as prescribed tranexamic acid.

**Keywords:** Case report, Pulmonary embolism, Thromboembolism, Tranexamic acid.

*World Journal of Laparoscopic Surgery* (2023): 10.5005/jp-journals-10033-1549

### BACKGROUND

Pulmonary embolism (PE) which more commonly results from deep vein thrombosis of the legs, might be asymptomatic, diagnosed accidentally, or in some cases, it can lead to sudden death.<sup>1</sup> It is a life-threatening condition and approximately occurs 23 to 69 in 1,00,000 patients. Proper treatment measures are usually effective.<sup>2</sup> Predisposing factors include coagulation factors deficiency, sedentary lifestyle, hypercoagulation due to cancers, pregnancy, trauma, oral contraception pills, and major surgeries.<sup>1</sup> The homeostatic system helps the integration of blood circulation following severe vascular damage through surgery.<sup>3</sup> A perturbation happens following major surgeries due to massive blood loss. A part of the body's response in this condition is fibrinolysis, which can be pathologic in some cases and leads to hyperfibrinolysis.<sup>3</sup> Tranexamic acid is a fibrinolytic medicine used mostly in major surgeries in order to prevent fibrinolysis and reduce blood loss.

### CASE DESCRIPTION

This case report is written to increase the healthcare providers' awareness, which tranexamic acid can cause pulmonary thromboembolism even in low-risk patients.

This case is an Iranian 39 years old, nulligravida woman who complained of menometrorrhagia and dysmenorrhea and was referred to a gynecology clinic. The patient mentioned using Ferinject months ago and she had been using mefenamic acid and Transid due to menorrhagia. The patient scored her dysmenorrhea 7 out of 10 based on the pain scale. Her menses pattern was 9 days of menorrhagia and clot and 4 days of spotting. Based on an ultrasound report in 2021 she had multiple myomas in her uterus, which caused menometrorrhagia. Ultrasound report showed an enlarged uterus with intramural myomas 24 mm, 14 mm, and a subserosal-intramural myoma sized 100 × 78 mm

<sup>1,2,4-6</sup>Department of Gynecology, Hoda International University, Iran

<sup>3</sup>Consultant Surgeon, World Laparoscopy Hospital, Gurugram, Haryana, India

**Corresponding Author:** Rajneesh Kumar Mishra, Consultant Surgeon, World Laparoscopy Hospital, Gurugram, Haryana, India, Phone: +91 9938989938, e-mail: contact@laparoscopyhospital.com

**How to cite this article:** Ardabili SN, Zeinali A, Mishra RK, et al. Pulmonary Thromboembolism While Receiving Tranexamic Acid after Laparotomy Myomectomy: A Case Report. *World J Lap Surg* 2023;16(1):52-53.

**Source of support:** Nil

**Conflict of interest:** Dr Rajneesh Kumar Mishra is associated as Editor-in-Chief of this journal and this manuscript was subjected to this journal's standard review procedures, with this peer review handled independently of the Editor-in-Chief and his research group.

**Patient consent statement:** The author(s) have obtained written informed consent from the patient for publication of the case report details and related images.

in the anterior fundus. Both ovaries were reported with normal appearance and no pelvic mass nor any fluid. The patient was healthy physically with BMI in the normal range, never smoked cigarettes or drank alcohol, and had no previous history of deep venous thrombosis (DVT) or PE. She also denied using any form of contraceptive pills, had a recent long flight journey, and had no significant family history of clotting disorders or cancer. She only mentioned that she is allergic to penicillin. She had no history of surgeries. She only mentioned hypothyroidism, which was under control, based on her laboratory result. The vital signs were in the normal range. A day before the operation the patient's laboratory results included hemoglobin of 11 g/dL, and all coagulation factors were in normal range. The surgery was performed by an open method and took an hour. The exact mass location under direct

supervision was superior to the cervix. During the operation, two packed cells were transfused due to massive bleeding, and then 1 gram of tranexamic acid was infused intravenously. Due to massive hemorrhage during surgery and the patient's normal BMI, we refused to prescribe heparin. A day after surgery hemoglobin was 9.3 g/dL. After 48 hours, the patient complained of shortness of breath. Blood oxygen saturation was 87% and the temperature was 38.7°C. Spiral-CT scan showed a right lower lobule embolism. Some degrees of atelectasis changes were detected in the right lower lung lobule and right middle lobe (RML). The patient was referred to ICU by a cardiologist and pulmonologist order. Echocardiography was normal. D-dimer was 3.67 (normal range was 0–0.5). Color Doppler ultrasound showed normal lower limb vessels. Enoxaparin 60 mg was prescribed subcutaneously two times a day in addition to that serum therapy and oxygen saturation monitoring were performed. After a week in ICU, the patient was discharged in good general condition and was prescribed apixaban 2.5 mg every day and a cardiopulmonary check weekly.

## DISCUSSION

Uterine myoma is usually a benign tumor in reproductive women and more commonly in women above 35 years old.<sup>4</sup> Most women with myoma are asymptomatic.<sup>5</sup> Symptomatic myomas are usually the ones, which make vessel changes in the endometrium.<sup>6</sup> Patients of reproductive ages are usually suggested myomectomy instead of hysterectomy.<sup>7</sup> Menstrual abnormality especially menorrhagia, which often leads to iron-deficiency anemia is the most common complication of uterine leiomyoma.<sup>8</sup> Tranexamic acid is an effective safe medicine using commonly to prevent and treatment of menorrhagia caused by medical, surgical, or even after surgeries as an anti-fibrinolytic treatment.<sup>9</sup> It directly blocks the formation of plasmin and the binding of plasminogen to fibrin and prevents the blood to be clotted.<sup>10</sup> Potential risk in thrombosis has been discussed since this medicine was introduced. Pulmonary thromboembolism is caused by venous thromboembolism, which moves through the circulation system and blocks the pulmonary arteries and it is life-threatening. Early diagnosis and proper treatment can reduce mortality and morbidity.<sup>11</sup> Although the correlation between tranexamic acid and thromboembolism has been reported, there are some studies, which claimed this medicine does not increase the risk of developing venous thromboembolism in the general population.<sup>12–14</sup> In addition to that, CRASH-2 showed using this medicine reduces the risk of myocardial infarction significantly and there is no effect on developing venous thromboembolism. However, some studies showed no relationship in using this medicine with thromboembolism.<sup>15–17</sup> What is more important is considering prothrombin time, and activated partial thromboplastin time.<sup>18</sup> It seems that there is a need for more studies with more statistical power. Although some studies suggest using anticoagulation as prophylaxis, thromboembolism, and hemorrhagic risk should be considered.<sup>19</sup>

## Clinical Significance

In our case, it seems that tranexamic acid caused thromboembolism as we did not find any other risk factor. It seems that considering the risk of thrombosis in each individual case as prescribed tranexamic acid can be beneficial.

## ACKNOWLEDGMENTS

The authors extend very special thanks to Atyieh Hospital and all staff.

## REFERENCES

1. Tapson VF. Acute pulmonary embolism. *N Engl J Med* 2008; 358(10):1037–1052. DOI: 10.1056/NEJMra072753.
2. Khademvatani K, Rezaei Y, Kerachian A, et al. Acute pulmonary embolism caused by enlarged uterine leiomyoma: a rare presentation. *Am J Case Rep* 2014;15:300–303. DOI: 10.12659/AJCR.890607.
3. Lawson JH, Murphy MP. Challenges for providing effective hemostasis in surgery and trauma. *Semin Hematol* 2004;41(1 Suppl 1):55–64. DOI: 10.1053/j.seminhematol.2003.11.012.
4. Gofur N, Gofur A, Soesilaningtyas GA, et al. Uterine myoma, risk factor and pathophysiology: A review article. *Clinics of Oncology* 2021;4(3):1–4.
5. Wallach EE, Buttram Jr VC, Reiter RC. Uterine leiomyomata: Etiology, symptomatology, and management. *Fertil Steril* 1981;36(4):433–445. DOI: 10.1016/s0015-0282(16)45789-4.
6. Farrer-Brown G, Beilby J, Tarbit M. The vascular patterns in myomatous uteri. *BJOG: An International Journal of Obstetrics & Gynaecology* 1970;77(11):967–975. DOI: <https://doi.org/10.1111/j.1471-0528.1970.tb03439.x>.
7. Okolo S. Incidence, aetiology and epidemiology of uterine fibroids. *Best Pract Res Clin Obstet Gynaecol* 2008;22(4):571–588. DOI: 10.1016/j.bpobgyn.2008.04.002.
8. Vollenhoven BJ, Lawrence AS, Healy DL. Uterine fibroids: A clinical review. *Br J Obstet Gynaecol.* 1990;97(4):285–298. DOI: 10.1111/j.1471-0528.1990.tb01804.x.
9. Pabinger I, Fries D, Schöchl H et al. Tranexamic acid for treatment and prophylaxis of bleeding and hyperfibrinolysis. *Wien Klin Wochenschrift* 2017;129(9):303–316. DOI: 10.1007/s00508-017-1194-y.
10. Reed MR, Woolley LT. Uses of tranexamic acid. *Continuing Education in Anaesthesia, Critical Care and Pain* 2015;15(1):32–37. DOI: <https://doi.org/10.1093/bjaceaccp/mku009>.
11. Smith SB, Geske JB, Maguire JM, et al. Early anticoagulation is associated with reduced mortality for acute pulmonary embolism. *Chest* 2010;137(6):1382–1390. DOI: 10.1378/chest.09-0959.
12. Sundström A, Seaman H, Kieler H, et al. The risk of venous thromboembolism associated with the use of tranexamic acid and other drugs used to treat menorrhagia: A case–control study using the General Practice Research Database. *BJOG: An International Journal of Obstetrics & Gynaecology* 2009;116(1):91–97. DOI: 10.1111/j.1471-0528.2008.01926.x.
13. Klaassen R, Selles C, van den Berg J, et al. Tranexamic acid therapy for postoperative bleeding after bariatric surgery. *BMC Obes* 2018;5(1):1–6.
14. Shiraishi A, Kushimoto S, Otomo Y, et al. Effectiveness of early administration of tranexamic acid in patients with severe trauma. *Journal of British Surgery* 2017;104(6):710–717. DOI: 10.1002/bjs.10497.
15. Krivokuca I, Lammers J-W. Recurrent pulmonary embolism associated with a hemostatic drug: Tranexamic acid. *Clin Appl Thromb Hemost* 2011;17(1):106–107. DOI: 10.1177/1076029609340902.
16. Salam A, King C, Orhan O, et al. The great deception: tranexamic acid and extensive pulmonary emboli. *BMJ Case Reports* 2013; 2013:bcr2012007808. DOI: 10.1136/bcr-2012-007808.
17. Morrison JJ, Dubose JJ, Rasmussen TE, et al. Military application of tranexamic acid in trauma emergency resuscitation (MATTERs) study. *Arch Surg* 2012;147(2):113–119. DOI: 10.1001/archsurg.2011.287.
18. Wiysonge CS, Kongnyuy E. Interventions to reduce haemorrhage during myomectomy for fibroids. *Cochrane Database Syst Rev* 2014;2014(8):CD005355. DOI: 10.1002/14651858.CD005355.pub5.
19. Nicolaidis A, Fareed J, Kakkar A, et al. Prevention and treatment of venous thromboembolism: International consensus statement (guidelines according to scientific evidence). *International angiology* 2006;25(2):101. DOI: <https://doi.org/10.1177/1076029612474840>.