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A rare case of submissive pulmonary embolism in a Krav Maga practitioner**Alvaro J Ramos-Rodriguez, Katherine Lopez, Fernando Vazquez de Lara, Bashar Mourad and Susannah Kurtz**
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Background: The occurrence of venous thromboembolism (VTE), consisting of deep vein thrombosis (DVT) and/or pulmonary embolism (PE), in athletes has been described in few case reports and small case series. DVT is classically related to venous stasis, intimal injury, and coagulation diathesis (Virchow's triad). To our knowledge, this is the first reported case of a traumatic lower extremity DVT causing submassive pulmonary embolism due to Krav Maga.

Methods: A 35-year-old female with past medical history of asthma presented to the emergency department complaining of 2 weeks of progressively worsening dyspnea. The patient reported three months of intermittent right lower extremity swelling and erythema prior to any respiratory symptoms, which she attributed to kicks directed to proximal part of right lower extremity while practicing Krav Maga. She denied recent travel, smoking, contraceptives or estrogen replacement therapy, previous pregnancies, history of miscarriages, clots or family history of hypercoagulability, autoimmune disorders and malignancy. Physical exam was remarkable for dyspnea on minimal exertion, tachycardia and hypoxia. Initial lab work including basic chemistries, complete blood count, urinalysis, beta-hcg, troponins and BNP were normal. Chest x-ray was normal. Electrocardiogram showed sinus tachycardia. D-dimer was increased to 5.81ug/mL. Computed tomography angiography of the chest was performed revealing large bilateral pulmonary emboli extending to segmental branches in both lungs with right ventricular dilatation (see Image 1). A bedside venous duplex ultrasound was significant for a large occlusive DVT in the right common femoral vein. Transthoracic echocardiography was unremarkable. The patient was started on enoxaparin 1mg/Kg every 12 hours and admitted to the intensive care unit to monitor respiratory status and hemodynamics. Hypercoagulability workup was positive for heterozygote Factor V Leiden; however antithrombin III, prothrombin F2 gene, homocysteine, protein C and S activity, antiphospholipid antibodies and antinuclear antibody were negative.

Conclusion: This case highlights the importance of considering trauma-induced VTE in young athletes presenting with new onset shortness of breath. Contact sports such as Krav Maga often expose patients to repetitive microtrauma and increased endothelial injury, predisposing them to developing thrombosis and life-threatening complications, especially those with coagulability. Two case reports reported in the literature of direct trauma-induced lower extremity DVT are in the popliteal region, an area more susceptible to external trauma. In our case, the DVT was deeper in the right common femoral vein and was provoked by powerful impacts she received during Krav Maga training. Our case was complicated by submassive PE. There is no formal consensus of anticoagulation length of therapy and timeline to return to contact sports after a DVT/PE; our patient was discharged on a minimum of 6-12 months of oral anticoagulation with close primary care follow-up and recommended to avoid further participation in Krav Maga and other high contact sports. More research is needed to determine the incidence of VTE in contact sports, optimal length of anticoagulation therapy and timeline to return to sports to establish even safer evidenced-based treatment plans to athletes after VTE.

Biography

Alvaro J Ramos-Rodriguez is currently a Medical Resident Physician at the Icahn School of Medicine at Mount Sinai West. He is the author of the recently published textbook *Dermatology for the USMLE*. He has dedicated a major part of his medical career to teaching and helping students prepare for the USMLE, including teaching review courses. His interest in dermatology includes DRESS syndrome, toxic erythema of chemotherapy, atopic dermatitis, hidradenitis suppurativa, dermatomyositis, psoriasis and infectious skin disorders.

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