

May 2018

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### Recommended Citation

Lanzer, Lauryn; Moore, Ryan; Ferian, Kelly; Walters, Elizabeth; and Gentile, Karyn (2018) "Collegiate Football Player Suffering from Non-Traumatic Hemoptysis," *Journal of Sports Medicine and Allied Health Sciences: Official Journal of the Ohio Athletic Trainers Association*: Vol. 4 : Iss. 1 , Article 27.

DOI: 10.25035/jsmahs.04.01.27

Available at: <https://scholarworks.bgsu.edu/jsmahs/vol4/iss1/27>

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## ***Collegiate Football Player Suffering from Non-Traumatic Hemoptysis***

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### ***OBJECTIVE***

To examine the treatment and management of non-traumatic hemoptysis in a collegiate football player.

### ***MEDICAL HISTORY***

A 23-year old, 242 pound, 6 foot 2 inch tall male, Caucasian collegiate football player (defensive lineman) reported to the Athletic Training Facility on August 30, 2017 stating that he noticed blood in his sputum the night before, as well as experienced sharp back pain, shortness of breath, left chest pain, and was tender upon palpation at the eleventh and twelfth ribs. While obtaining the patient's history, he reported no recognition of being hit in the flank area, rib cage, or being tackled at practice. The patient denied any known injury, fever, chills, calf tenderness, and noted that the chest pain he was experiencing subsided on the evening of August 30. The patient's vitals were within normal limits while under the care of the emergency department physician (pulse 76 bpm, respiratory rate 16 bpm, body temperature 98.9°F), except for a blood pressure of 150/80 mmHg, which was elevated compared to pre-participation readings of 118/82 mmHg. The patient's mother stated that several members of the family have a positive history of deep vein thrombosis (DVT) and pulmonary emboli (PE), but the family is unaware of a clotting disorder. The patient denied a personal history of DVT or PE, as well as any recent immobilization, travel, surgery, or trauma that could have been a precursor to a potential blood clotting condition. He stated that he has a negative social history of smoking, drug use, or alcohol abuse.

### ***DIFFERENTIAL DIAGNOSIS***

Spontaneous pneumothorax, bronchitis, small-cell lung cancer, intercostal muscle strain, tuberculosis.

### ***RELATED LITERATURE***

Hemoptysis can be classified by the amount of blood lost per day to distinguish between massive and non-massive hemoptysis.<sup>1</sup> An expectorated blood volume between 100 and 1,000 mL have been used to define massive hemoptysis, but there is no volume that has been universally accepted in scientific literature.<sup>1</sup> Literature indicated that up to 42% of hemoptysis cases have no identifiable cause.<sup>1</sup> Over half of the affected population experiences PE due to factors including family history of clotting disorders, heart attack, stroke, trauma, and leading a sedentary lifestyle.<sup>2</sup> In previous research, hemoptysis has a direct correlation to pulmonary contusions as a result of direct trauma, such as those seen in a collegiate football player and diver.<sup>3-4</sup>

### ***TREATMENT and MANAGEMENT***

The patient's Athletic Trainers and Team Physician deemed it necessary to order a chest x-ray. Due to negative results, the patient was then instructed to go to the emergency department, where a computed tomography (CT) scan was subsequently requested, accompanied by an electrocardiogram (ECG) to rule out additional pathologies. The patient was treated for bilateral PE, as well as a left lower lobe pulmonary infarction as confirmed by the chest CT scan. He was placed on an anticoagulant medication and admitted to a local hospital for continued observation. While in the hospital, he was initially prescribed Rivaroxaban in 15 mg tablets, to be

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followed with a regimen of 20 mg tablets. After 48 hours, the patient was released from the hospital under the care of the Team Physician at which time ibuprofen and acetaminophen used for back pain were discontinued and a strict blood thinner regimen was implemented. In an effort to aid in finding a cause for the PE and pulmonary infarction the Team Physician referred the patient to a Hematologist to be tested for Factor V Leiden, as well as the prothrombin gene. Both genetic tests elicited negative results. The patient was instructed by the hematologist to remain on a blood thinner regimen for six to twelve months. It was decided that it was in the best interest of the patient's long-term health to not return to competition due to the sudden and ambiguous symptoms of hemoptysis.

### **UNIQUENESS**

Pertaining to this case, there is limited research discussing the non-traumatic nature of hemoptysis. Other unique features to this case include the patient's negative genetic testing for possible clotting factors related to PE. In most cases, hemoptysis is caused by predisposing factors, such as stroke, heart attack, or trauma, none of which the patient experienced.<sup>1</sup> However, it is noted in a recent case study surrounding a collegiate gymnast suffering from non-traumatic hemoptysis and bilateral pulmonary emboli, that the athlete

be placed on anticoagulant therapy and withdrawn from competition.<sup>5</sup>

### **CONCLUSION**

Due to the danger of competing in a collision sport while on a blood thinner regimen for recovery of idiopathic bilateral PE and pulmonary infarction, patients should be withheld from participation based on findings from previous research.<sup>1</sup> The Team Physician, in collaboration with the patient and his specialists, decided to medically withdraw the athlete from contact competition.

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**Key words:** *collegiate football player, non-traumatic, hemoptysis*