PIONEER
MEDICAL JOURNAL

Vol. 3 No. 2 Jul. - Dec., 2023

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following a redesign and restructuring of the journal website.
The correct bibliographic designation for this article is Volume 7, No. 1 (July–December 2022),
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This correction affects only the volume, issue, and publication-period metadata.
The article content, DOI, authorship, pagination, and publication date remain unchanged.

www.pioneermedicaljournal.com
ISSN: 2354 - 1954

Official Publication of The Medical and Dental Consultants' Association of Nigeria *(MDCAN)*
FMC, Umuahia Chapter.

PIONEER

MEDICAL

JOURNAL

FMC, UMUAHIA

CLINICAL ILLUSTRATION

When duty turns fatal: A case of sudden death from saddle pulmonary embolism in a 37 year-old. A case report.

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Abstract
Sudden death in a young, seemingly healthy individual is a tragic and alarming event. We report a case of a 37 year old male hotel supervisor who succumbed to a saddle pulmonary embolism while on duty. The diagnosis was confirmed post-mortem via autopsy. This case underscores the importance of early recognition and prevention of venous thromboembolism even in individuals without apparent risk factors. The lesson from this report is lack of prior symptoms in an apparently healthy young man with no traditional risk factors for pulmonary embolism. A review of the clinical significance, risk factors and preventive strategies for pulmonary embolism is presented.

Keywords: Sudden death, pulmonary embolism, saddle embolus, autopsy

Introduction

Sudden unexpected death in young individuals poses a significant diagnostic and public health challenge. Among the potential causes, pulmonary embolism (PE) is a life-threatening condition that often remains undiagnosed until death. A saddle pulmonary embolism, characterized by a thrombus lodged at the bifurcation of the main pulmonary artery, is particularly catastrophic. Embolism refers to a blood clot (thrombus) that has broken off and is moving freely in the blood vessel. It can travel to another part of the body and cause a blockage of a blood vessel. Most blood clots that become pulmonary emboli form in veins in the leg[1]. When a blood clot is in a pulmonary artery, it blocks the movement of blood to the lung that needs to pick up oxygen. If enough blood does not gets oxygen and moves to the left side of the heart, the oxygen level in the body decreases dangerously low which can lead to stress and damage to all the organs in body including the brain, kidneys, and heart[1]. A saddle embolus can obstruct

both pulmonary arteries, leading to acute right heart strain, circulatory collapse, and sudden death. This case highlights the silent nature of PE and the need for vigilance, even in the absence of clear predisposing factors.

Case presentation

A 37 year-old moderately built male hotel supervisor who was found unresponsive at his workstation at 0700 hours. He had no prior history of chronic illness or significant medical complaints and was reportedly in good health few hours before his demise. He was said to have moved round to supervise some workers earlier in the day and thereafter went to his desk where he was found lifeless. He was found lifeless on his seat in his office and was declared dead at the hospital.

An autopsy was conducted to determine the cause of death. External examination shows bluish discoloration (cyanosis) of the tongue as well as the nail beds of all fingers.

Gross examination of the cardiopulmonary block reveals heavy lungs (right: 716g and left: 632g) and severe pulmonary oedema with massive outpouring of whitish frothy fluid from the larynx, see figure 1. Cut sections of the lungs shows congested surfaces and exude copious amount of whitish frothy fluid. A large saddle embolus obstructing the pulmonary artery bifurcation was seen, see figure 2. This thrombus took the shape of the vessel, was firmly attached to the endothelium of the vessel which showed vital reaction, see figure 3. The embolus also showed lines of Zahn. The heart is enlarged and weighs 388g but maintains normal configuration. The heart chambers are dilated. The left ventricular free wall thickness is 1.7cm. The papillary muscles are matted together with average thickness of 1.6cm. Right auricular mural thrombus was also seen as well as hepatic venous thrombi. Microscopic examination confirmed the presence of thrombi with features consistent with acute embolism.

No evidence of predisposing factors, such as trauma, surgery or malignancy was found. However, the deceased's work involves prolonged periods of sedentary activity, which may have contributed to venous stasis.

Figure 1: The trachea showing massive outpouring of whitish frothy fluid from the lungs (pulmonary oedema).

Figure 2: Section of the heart showing dissected pulmonary trunk and its bifurcation with massive thrombus.

Figure 3: The intima of the pulmonary artery being compared with that of the aorta. There is vital reaction (hyparaemia) of the pulmonary artery.

Discussion

Saddle pulmonary embolism generally affects the older population unlike in this index young patient's case[2]. PE represents a spectrum of syndromes ranging from small peripheral emboli causing pleuritic pain to massive pulmonary embolism resulting in cardiogenic shock or cardiac arrest[3]. Saddle pulmonary embolism is a form of large pulmonary thromboembolism that straddles the main pulmonary arterial trunk at its bifurcation, usually extending into the main right and left pulmonary arteries with the potential to cause cardiogenic shock and death[3-4]. Its incidence among patients diagnosed with pulmonary embolism is approximately 2.6%[3]. Saddle pulmonary embolism frequently results in significant hemodynamic instability and signals the potential for imminent hemodynamic collapse[3]. There are well-known risk factors for development of pulmonary embolism, including inherited blood clotting disorder, venous stasis, obesity, advanced age, confirmed deep venous thrombosis, prolonged inactivity, cigarette smoking, hypercoagulable states, underlying malignancies, severe truama, fractures, autoimmune disorders, birth control pills, hormone replacement therapy, pregnancy and puerperium[1-2,5-6]. Comorbidities specifically associated with massive pulmonary embolism include congestive heart failure, renal dysfunction, decreased left ventricular systolic ejection fraction, cardiopulmonary disease and right ventricular thrombi[1-3]. The more risk factors a person has, the greater the chance of having pulmonary embolism. The absence of overt risk factors in this index case underscores the unpredictable nature of venous thromboembolism. Potential contributors, such as prolonged immobility during duty hours, highlight the role of modifiable workplace-related risk factors. The incidence of mortality after pulmonary embolism has been reported to be as high as 300,000 per year, with a three-month mortality of 15% - 18%[3]. Typical symptoms are shortness of breath, chest

pain exacerbated by deep inhalation, lightheadedness, dyspnea at rest, anxiety, and syncope[1, 2]. Although about 300 000 new cases of deep venous thrombosis are diagnosed yearly in the United States, probably 3 to 4 times as many cases occur without obvious symptoms as in this index case and are never detected[6]. This illness is often "silent" and can mimic other common conditions such as heart attack, pneumonia, and anxiety. Its aftermath spans a wide spectrum, from inconsequential to fatal[6] as in this index case.

This case emphasizes the importance of preventive measures, especially in sedentary professions. These may include periodic movement, hydration, exercise, and awareness campaigns to mitigate the risk of venous stasis and thrombosis[5].

Conclusion

This case of sudden death due to saddle pulmonary embolism highlights the silent and unpredictable nature of this condition. It calls for heightened awareness of venous thromboembolism (VTE) risk in all individuals, including those without classical risk factors. Workplace health initiatives targeting sedentary behaviours may play a crucial role in preventing such tragedies. Though saddle pulmonary embolisms are rare, it is important to further promote research in this field and awareness to those with similar occupations due to the significant morbidity of this condition. Saddle emboli are often silent before they progress to acute cardiogenic shock or leave survivors with chronic pulmonary hypertension. It is important to recognize people who are at increased risk of a deep venous thrombosis (DVT) as there can be ways to prevent them.

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