

# The Hidden Jewel in Syncope: A Case Compilation

SAKILA VIJAYARAJAN<sup>1</sup>, MOHD.HAMDAN SAPARWAN<sup>2</sup>,  
AVINESHWARAN BALASANDIREN<sup>3</sup>, SARJIT SINGH<sup>4</sup>  
HOSPITAL SERDANG, SELANGOR, MALAYSIA



## Introduction

Syncope is a common presentation in which 1 in 4 people might experience in their lifetime<sup>1</sup>. The prevalence of pulmonary embolism (PE) among these patients are not well documented and current guidelines does not include a workup for pulmonary embolism as part of initial assessment of syncope. However, a study aiming at evaluating the incidence of PE in hospitalized patients after a first syncope episode found a prevalence as high as 17%<sup>2</sup>. In this case compilation, we discuss the importance of ruling out PE in patients who are presenting to the emergency department with syncope.

## Case description

### Case 1

A 29-year-old gentleman with no past medical illness presented to emergency room with syncopal attack while in the bathroom lasting several minutes. Initial screening showed unremarkable finding. During admission he developed second episode of syncope while on bed and an episode of hypotension. Blood investigation showed raised D dimer with electrocardiogram of S1Q3T3 and CT Pulmonary Angiography (CTPA) revealed saddle embolus at bifurcation of pulmonary trunk over bilateral pulmonary arteries with extension into right interlobar and left interlobar arteries. Patient underwent emergency embolectomy for the massive pulmonary embolism and was later discharged well with lifelong anticoagulant

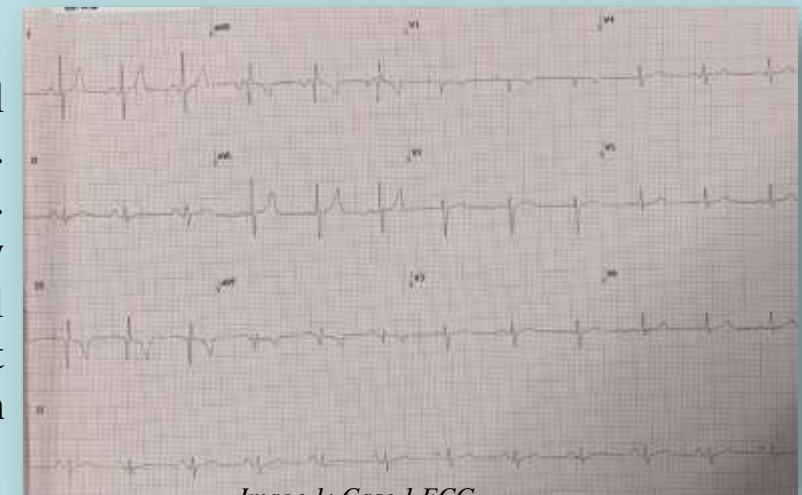


Image 1: Case 1 ECG

### Case 2

A 49-year-old lady who was recovering in ward day 2 for myomectomy developed syncope lasting several seconds. Prior to syncope she has been complaining of right calf tenderness. Initial investigation showed mild anemia (hemoglobin 8.4), normal echocardiography, negative 2-point compression test, echocardiogram of sinus tachycardia with raised D dimer. CTPA revealed extensive pulmonary embolism involving bilateral main pulmonary arteries extending to bilateral segmental and subsegmental arteries. In view of non-massive PE, she was started on oral anticoagulant, given blood transfusion, and discharged well. Repeated CTPA after 3 months revealed a resolved pulmonary embolism



Image 2: Case 1 CT scan

## Discussion

Pulmonary embolism with syncope as the initial presenting symptom is rare. Previous studies found that it only occurs in less than 1%<sup>3</sup>. However, if syncope is the presenting complaint, according to the International Cooperative Pulmonary Embolism Registry, the 3-month mortality rate of patients with syncope was 26.8%<sup>17</sup>. Syncope in the setting of pulmonary embolism can be due to the three possible mechanisms. First, greater than 50% occlusion of the pulmonary vascular tree causes RV failure and impaired LV filling, leading to a reduction in cardiac output, arterial hypotension, reduced cerebral blood flow, and ultimately syncope. The second mechanism is the appearance of arrhythmias associated with RV overload. Lastly, the embolism can trigger a vasovagal reflex that leads to neurogenic syncope<sup>4</sup>. However, hypoxemia secondary to ventilation or perfusion abnormalities must also be considered in the development of syncope. Moreover, acute pulmonary hypertension may also lead to right-to-left flow across a patent foramen ovale, and thus exacerbate hypoxemia<sup>8,9</sup>

The clinician should seek the following clues to the diagnosis of pulmonary embolism in patients who presented with syncope: (a) hypotension and tachycardia or transient bradyarrhythmia; (b) acute cor pulmonale according to ECG criteria or physical examination; (c) other signs and symptoms indicative of pulmonary embolism, (d) confounding factors masking the initial presentation<sup>5</sup>. The presence of any of these findings without other obvious causes of syncope should lead to further work-up, including ABG analysis, VQ scanning, lower extremity duplex sonogram, ECG, multi-slice CT and angiography, if necessary. Although oxygen saturation levels are inadequate for screening purposes, respiratory alkalosis with hypoxia and increased A-a gradient are typically seen. However, results of blood gas analysis are normal in 10% of cases<sup>10,11</sup>

Our first patient had complaints of dyspnea and dizziness, following a syncopal episode. He had no obvious risk factors, however due to the raised D dimer, pulmonary embolism was initially considered, and all the diagnostic procedures were carried out to prove this presumptive diagnosis. While in our second case, the patient was presented with syncopal attack, mild dyspnea and right calf tenderness. She comparatively had risk factors such as recent history of surgery (patient was in Day 2 of post myomectomy for multiple uterine fibroid) and was on oral contraceptive pills for 4 months (for menorrhagia control). She had another confounding factor of anemia (hemoglobin during presentation was 8.4) which could also lead to the development of her symptoms, mislead the clinician, and might delay the diagnosis of pulmonary embolism.

## Conclusion

We shared a compilation of pulmonary embolism cases, both presented with syncope which could have poor prognosis that can lead to an immediate death. Thus, any patient who visited to the emergency department with such symptoms should be investigated thoroughly and pulmonary embolism needs to be excluded as one of the underlying etiologies.

## Declaration of conflict

The author(s) declare(s) that there is no conflict of interest

## References

1. ELPIDOFOROSS. SOTERIADES JE, MARTIN G. LARSON. INCIDENCE AND PROGNOSIS OF SYNCOPE. *The New England Journal of Medicine*. 2002;347(12).
2. Paolo Prandoni AWAL, Martin H. Prins, Maurizio Ciammaichella. Prevalence of Pulmonary Embolism among Patients Hospitalized for Syncope. *The new england journal of medicine*. 2016.
3. Oqab Z, Ganshorn H, Sheldon R. Prevalence of pulmonary embolism in patients presenting with syncope. A systematic review and meta-analysis. *Am J Emerg Med*. 2018;36(4):551-555.
4. Polyxeni Koutkia TJW. Pulmonary embolism presenting as syncope:Case report and review of the literature. *Heart & Lung*. 1999;28(5):343-347.
5. Marc D. Thames JSA, James E. Dalen. Syncope in Patients with Pulmonary Embolism. *JAMA Intern Med*. 1977;238:2509-2511.
6. R Castelli CT, G Pantaleo. Syncope in patients with pulmonary embolism:comparison between patients with syncope as the presenting symptom of pulmonary embolism and patients with pulmonary embolism without syncope. *Vascular medicine*. 2003.
7. Goldhaber SZ, Visani L, De Rosa M. Acute pulmonary embolism: clinical outcomes in the International Cooperative Pulmonary Embolism Registry (ICOPER) *Lancet*. 1999;353(9162):1386-1389. doi: 10.1016/S0140-6736(98)07534-5
8. Thames MD, Alpert JS, Dalen JE. Syncope in patients with pulmonary embolism. *JAMA*. 1977;238:2509-2511. doi: 10.1001/jama.238.23.2509
9. Simpson RJ, Podolak R, Mangano CA Jr, Foster JR, Dalldorf FG. Vagal syncope during recurrent pulmonary embolism. *JAMA*. 1983;249:390-393. doi: 10.1001/jama.249.3.390
10. Varon J, Fromm RE. Syncope: the forgotten sign of pulmonary embolism. *J Emerg Med*. 1998;16:117-118. doi: 10.1016/S0736-4679(98)00061-4
11. Soloff LA, Rodman T. Acute pulmonary embolism. *Am Heart J*. 1967;74:629-647.