

References

- [1] Davis WT, Montrieff T, Koefman A, Long B. Dysrhythmias and heart failure complicating acute myocardial infarction: an emergency medicine review. *Am J Emerg Med* 2019 April 27. <https://doi.org/10.1016/j.ajem.2019.04.047> [pii: S0735-6757(19)30272-4].
- [2] Namana V, Gupta SS, Abbasi AA, Raheja H, Shani J, Hollander G. Right ventricular infarction. *Cardiovasc Revasc Med* 2018;19:41–50.
- [3] Al-Mane N, Al-Mane F, Abdalla Z, McDonnell J. Acute surgical abdomen: an unusual presentation of pulmonary embolus. *J Investig Med High Impact Case Rep* 2014. <https://doi.org/10.1177/2324709614542339hic.sagepub.com>.
- [4] Goldstein JA. Pathophysiology and management of right heart ischemia. *JACC* 2002;40:841–53.
- [5] Bikdeli B, Ziki MD, Lip GYH. Pulmonary embolism and atrial fibrillation: two sides of the same coin? A systematic review. *Semin Thromb Hemost* 2017;43:849–63.
- [6] Elias J, Kuniyoshi R, Moulin B, Cuhna F, Castro E, Nunes A, et al. Syncope and complete atrioventricular block related to pulmonary thromboembolism. *Arq Bras Cardiol* 2004;83:438–41.
- [7] Makavos G, Cholevas NV, Rallidis LS. A reversible cause of hypoxaemia in a patient with acute right ventricular infarction. *Hellenic J Cardiol* 2019 [Article in press].
- [8] Albaghdadi A, Teleb M, Porres-Agullar M, Porres-Munoz M, Marmol-Velez A. The dilemma of refractory hypoxemia after inferior wall myocardial infarction. *Proc Bayl Univ Med Cent* 2018;31:67–9.

Response: Pulmonary embolism and shunt in acute myocardial infarction



We thank the authors for these clinically important observations relating to the management of right ventricular (RV) failure in the ED and their discussion of several interesting cases. Pulmonary embolism (PE) should be considered in the differential diagnosis of a patient presenting to the ED with acute RV failure. Additional etiologies to consider include valvular heart disease, tamponade physiology, and cardiomyopathies [1]. Differentiation of PE and acute myocardial infarction (AMI) can be clinically challenging, as ST elevation in leads V1–V4 may be present in up to 5% of acute PE [2]. The time pressure to achieve early revascularization for AMI can lead to delays in recognizing PE [2]. Rarely, AMI and PE can present concomitantly due to paradoxical embolism from the PE across an atrial septal defect (ASD) or patent foramen ovale (PFO) causing AMI [3]. Early cardiology consultation for echocardiography and possible revascularization are critical for this patient population [4]. PE should remain on the differential diagnosis in patients with ECG changes suggestive of AMI, particularly for patients with severe hypoxemia without pulmonary edema or in those with clinical history suggestive of PE [3].

Hypoxemia should be addressed in acute RV failure to decrease RV afterload from hypoxic pulmonary vasoconstriction [1]. The authors point out that hypoxemia may be nonresponsive to supplemental oxygen due to shunt physiology from diastolic dysfunction secondary to RV infarction [5]. Increased pulmonary artery pressures and right atrial pressures may also result in the formation of a right-to-left shunt in the setting of an ASD with a baseline left-to-right shunt. Early revascularization for eligible patients is a priority in ED management [4]. Patients with refractory hypoxemia may require additional workup in the ICU setting to include transesophageal echocardiography with agitated saline contrast to evaluate for PFO [5].

Declaration of Competing Interest

None.

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References

- [1] Lahm T, McCaslin CA, Wozniak TC, et al. Medical and surgical treatment of acute right ventricular failure. *J Am Coll Cardiol* 2010;56(18):1435–46. <https://doi.org/10.1016/j.jacc.2010.05.046>.
- [2] Omar HR. ST-segment elevation in V1–V4 in acute pulmonary embolism: a case presentation and review of literature. *Eur Hear J Acute Cardiovasc Care* 2016;5(8):579–86. <https://doi.org/10.1177/2048872615604273>.
- [3] Alkhalil M, Cahill TJ, Boardman H, Choudhury RP. Concomitant pulmonary embolism and myocardial infarction due to paradoxical embolism across a patent foramen ovale: a case report. *Eur Hear J-Case Reports* 2017;1(2). <https://doi.org/10.1093/ehjcr/ytx010>.
- [4] Davis WT, Montrieff T, Koefman A, Long B. Dysrhythmias and heart failure complicating acute myocardial infarction: an emergency medicine review. *Am J Emerg Med* April 2019. <https://doi.org/10.1016/j.ajem.2019.04.047>.
- [5] Albaghdadi A, Teleb M, Porres-Aguilar M, Porres-Munoz M, Marmol-Velez A. The dilemma of refractory hypoxemia after inferior wall myocardial infarction. *Proc (Bayl Univ Med Cent)* 2018;31(1):67–9. <https://doi.org/10.1080/08998280.2017.1401347>.

Understanding the benefits of early high-flow nasal cannula therapy for adults with acute hypoxemic respiratory failure in the ED



To the Editor:

We have read with great interest the recent study published by Macé et al. [1], which described the impact of early high-flow nasal cannula oxygen therapy in adults presenting with acute hypoxemic respiratory failure in the ED; most notably observing faster recovery or regression of respiratory failure with HFNC.

However, we believe this observation necessitates a more precise analysis of the improvement in oxygenation, and the unique factors associated with regression, to better understand the faster recovery of respiratory failure described in this study.

The study population consisted mainly of patients with community-acquired pneumonia with similar PaCO₂ values that did not differ in the