

# Arterial Gas Embolism While Diving: A Case Report

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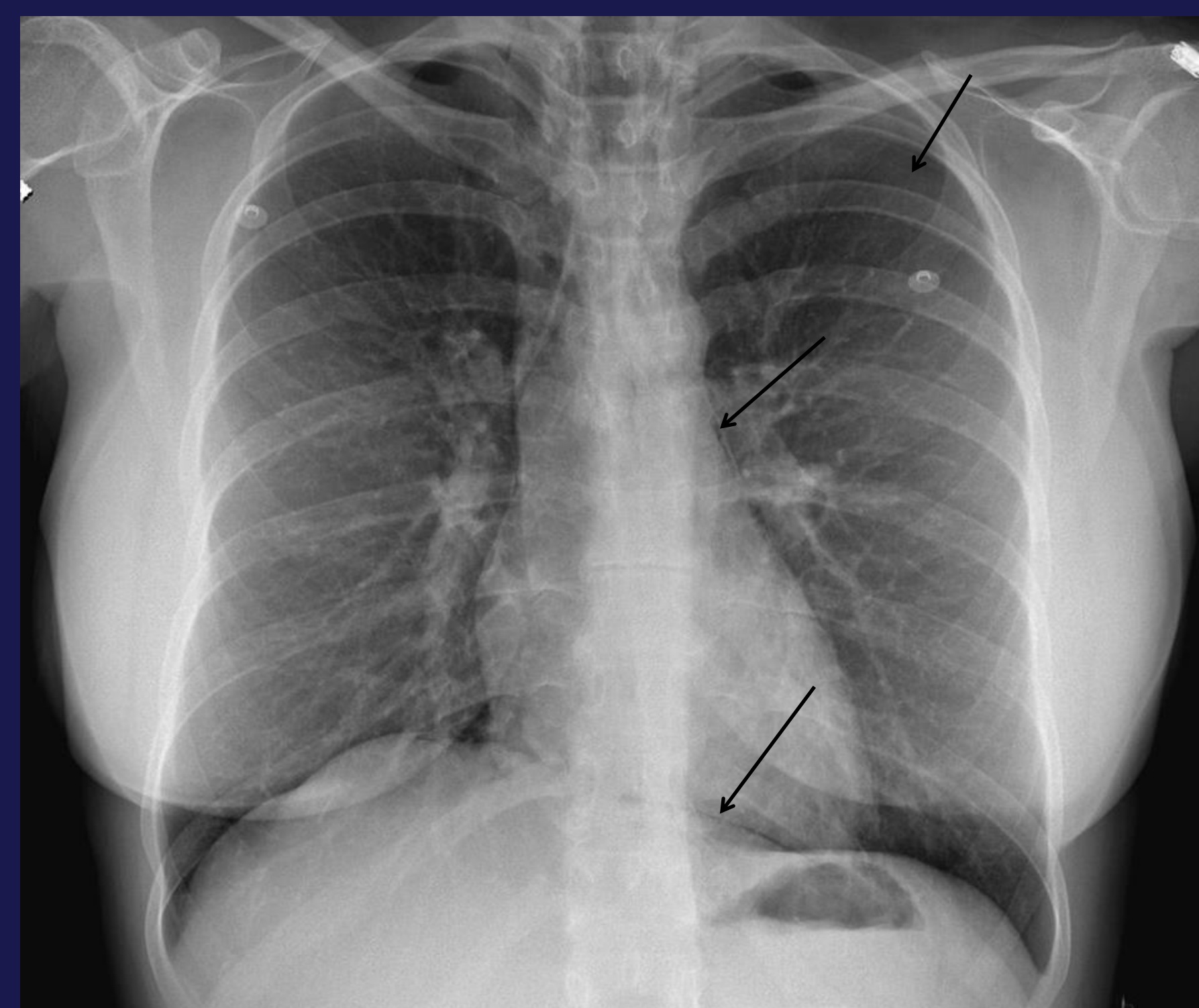
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## Introduction

- A previously healthy SCUBA diver presented to the emergency department after a diving related incident with a pneumomediastinum, pneumothorax and a non-ST elevation myocardial infarction (NSTEMI)

## Case Report

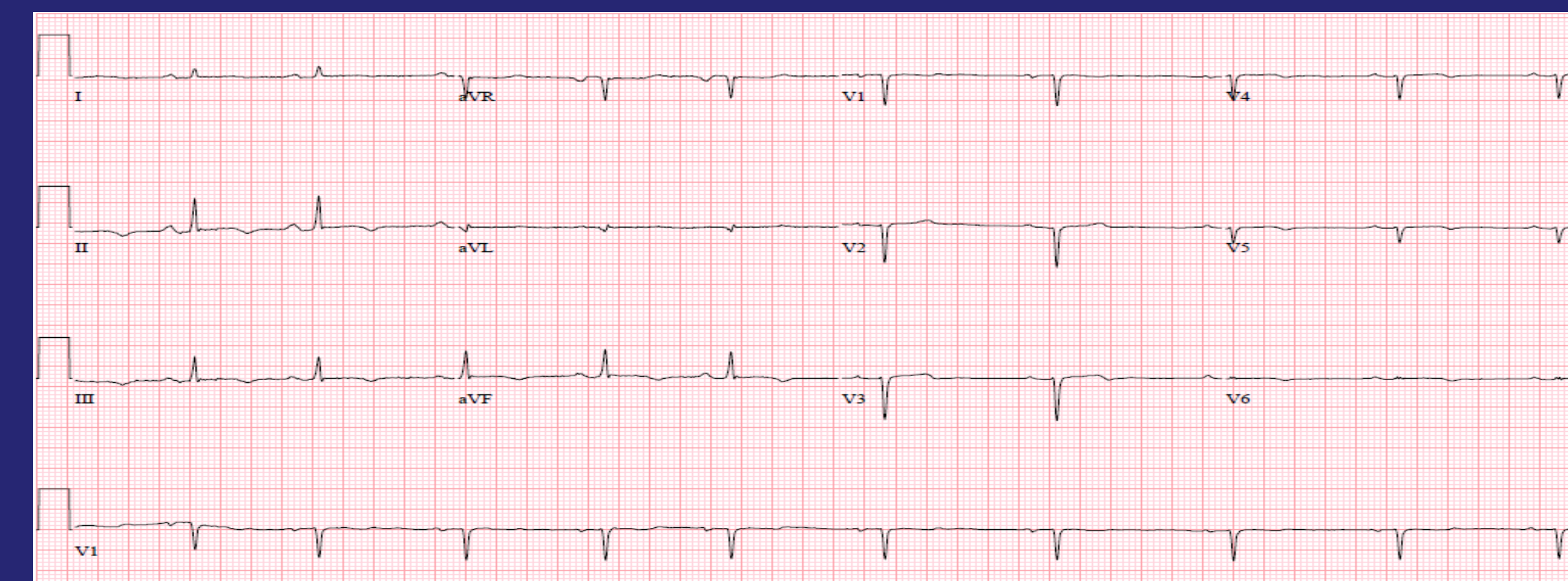
- A 34 year-old woman with no significant medical history presented to the emergency department following an episode of loss of consciousness and seizure-like activity after an uncontrolled ascent during a dive in a fresh-water lake at 6,000 feet of altitude
- In the emergency department, she complained of retrosternal pleuritic-type chest pain. She had a normal physical and neurological examination as well as normal complete blood count, basic metabolic panel and troponin level
- Her chest radiograph showed a pneumomediastinum, pneumopericardium, and a small left apical pneumothorax (**Figure 1**). She was discharged home and instructed to return if symptoms worsened



**Figure 1:** Postero-anterior chest radiograph showing pneumomediastinum, pneumopericardium and pneumothorax

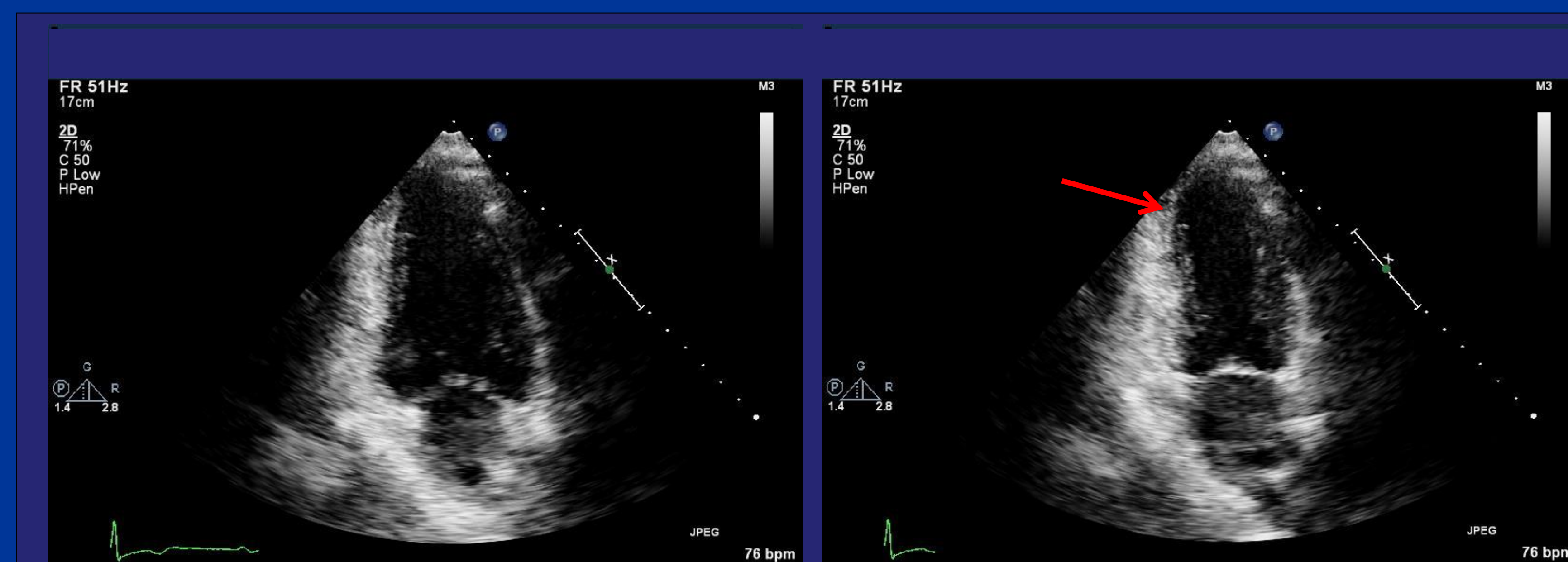
## Case Report (Cont'd)

- Twenty-four hours later she returned to the ED with worsening chest pain. **Troponin level 2.5 ng/ml** (normal <0.02ng/ml)
- Her electrocardiogram was abnormal (**Figure 2**). She remained without neurological deficits



**Figure 2:** 12-lead Electrocardiogram showing poor R-wave progression and T-wave inversions in an infero-apical distribution

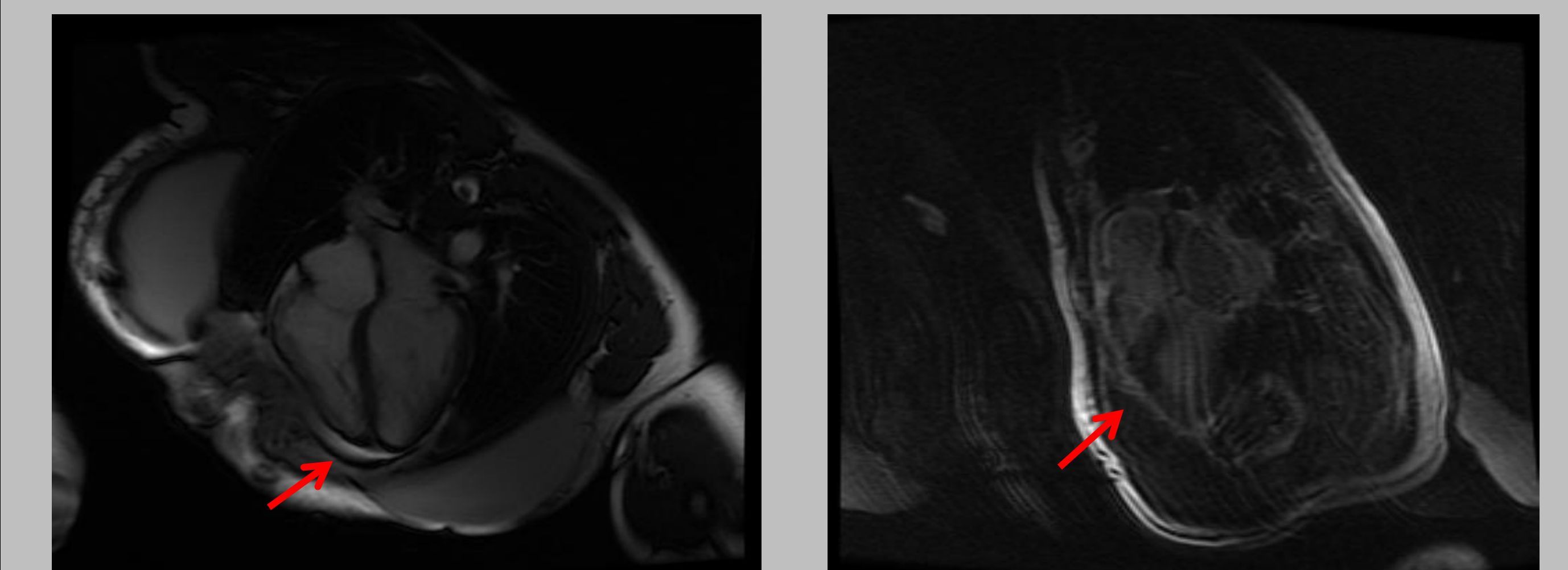
- Hyperbaric oxygen was not given since >24h had elapsed and she remained neurologically normal
- A prompt cardiology evaluation was performed. Echocardiogram showed apical akinesis (**Figure 3**) and coronary angiogram showed no evidence of coronary artery disease.
- She was discharged from the hospital on angiotensin converting enzyme inhibitors. Two weeks later a repeat echocardiogram showed normal cardiac function.



**Figure 3:** Transthoracic Echocardiogram, apical two chamber view showing the left ventricle at end-diastole (left) and end-systole (right) with apical akinesis

## Follow-up

- She had vague retrosternal pain thought to be caused by microvascular ischemia. Long-acting nitrates and dihydropyridine calcium channel blockers for one month provided partial relief.
- Later, persistent chest discomfort led to a diagnosis of pericarditis confirmed by C-MRI (**Figure 4**) that required escalating treatment with NSAID's, colchicine and prednisone
- Five months after presentation she was symptom free and completed a stress test to 17 Metabolic equivalents.



**Figure 4:** Cardiac MRI showing a small pericardial effusion adjacent to the right ventricle and the apex of the left ventricle (left) and delayed pericardial enhancement suggestive of pericarditis (right)

## Conclusion

- This patient's presentation points towards a coronary gas embolism secondary to pulmonary barotrauma
- The initial neurological injury resolved quickly with oxygen, there was, however, associated cardiac injury resulting in depressed myocardial function and, later, pericarditis
- Coronary embolism is a rare occurrence in diving accidents<sup>1-4</sup>, and this could be the first reported case of pericarditis related to barotrauma and gas embolism

## References

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