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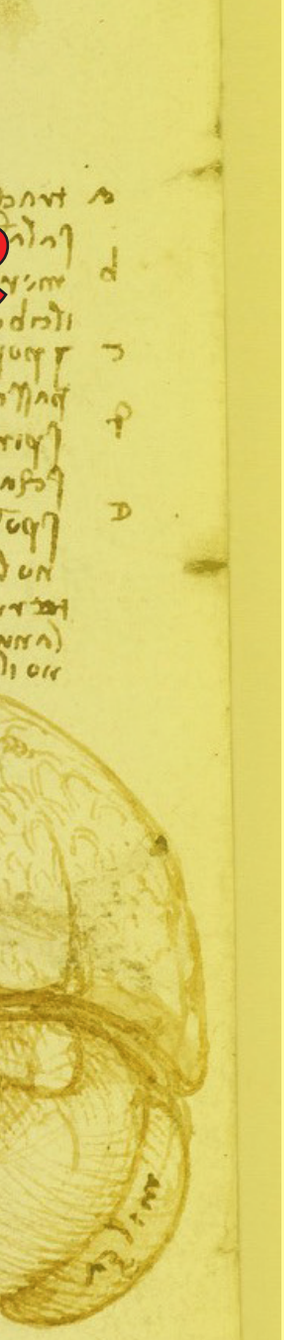


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# Sudden Severe Chest Pain:

## An atypical presentation of an infective exacerbation of COPD

**by Arlene Gutman, Nikoleta Tellios,**
*Reviewed by Collette Hand*



# Abstract

## Presentation

A 59-year-old female, recent ex smoker, with a history of COPD and anxiety, presents to her GP with acute onset sharp chest pain, associated with dyspnea, diaphoresis and palpitations. On examination tachycardia, tachypnea and rhonchi were noted in the absence of fever and crepitations.

## Differential Diagnosis

Her presentation raises suspicion for several conditions that require urgent treatment, including AMI, PE and pneumothorax. Few indicators of infection were present initially.

## Investigations

Given the risk of life-threatening conditions included in the differential diagnosis, hospital work-up was warranted. Investigations for AMI, PE, and pneumothorax were negative.  Further investigations and development of the clinical course led to the conclusion of a diagnosis of IECOPD.

## Conclusion

Presentations of IECOPD can be diagnostically difficult. Although pain is not usual in IECOPD and pyrexia is common, this case illustrates the absence of such features in the presence of additional atypical features. Furthermore, acute chest pain often requires hospital investigation even if the ultimate diagnosis may be managed by the GP.

## Case Background

Recent reports estimate that up to 1.5% of all general practitioner (GP) consultations are related to chest pain(1). This symptom can be distressing for patients and diagnostically challenging for GPs. While cardiovascular causes are the most common, chest pain may also present in respiratory, musculoskeletal, and gastrointestinal conditions. Given the potential serious nature of acute onset chest pain, the primary goal of management is to rule out life-threats and provide timely care. One important respiratory cause of chest pain is an infective exacerbation of chronic obstructive pulmonary disease (IECOPD). Chronic obstructive pulmonary disease (COPD) is common, with current reports estimating 180,000 individuals in Ireland(2) and 1 million individuals in the UK are diagnosed(3) with COPD. The burden of care falls on the GP, as does the responsibility of recognizing the need for further specialist care.

## Case Details

A 59-year-old female with a 10-year history of COPD presented to her GP with a 3-day history of acute onset sharp, lower left-sided chest pain. The pain was slightly exacerbated by inspiration with no radiation. At onset, the patient experienced diaphoresis, palpitations, and dyspnea which continued at the GP's surgery. The patient reported she was more short of breath than normal despite increasing the use of her bronchodilators. Additional attempts to self-manage with over-the-counter analgesia and application of a heating-pad provided no relief. Notably, past medical history was significant for 2-3 IECOPD in the previous year, mixed anxiety and depression, osteoporosis, and a 13-pack/year smoking history. Relevant risk factors for an acute cardiovascular event included her age, a 13-pack/year smoking history, and longstanding respiratory disease.

On initial examination, tachycardia and tachypnea were observed along with decreased peripheral oxygen saturation, although this was within the patient's usual range. All other vitals were within normal range, including the absence of pyrexia. Mild bilateral rhonchi and normal heart sounds were heard on auscultation. Given the potential life-threatening conditions associated with acute onset chest pain, the patient was referred to hospital.

## Discussions

The primary concern with acute onset chest pain is an acute myocardial infarction (AMI). In this case, the pain was associated with dyspnea, tachycardia and diaphoresis at onset, making it an important possibility to consider. Given that AMI often presents atypically in women, it cannot be excluded based on the history, although the prolonged duration of symptoms makes this diagnosis less plausible. An echocardiogram (ECG) would be the principal diagnostic tool, although ECG changes can occur on a background of chronic respiratory disease.

Acute sharp chest pain, dyspnea, and tachycardia are associated with a low diagnostic threshold for a pulmonary embolism (PE). Importantly, further investigation requires referral to emergency or hospital services. In this case, the patient was not considered high risk for a PE according to the Wells' Criteria, although patients with COPD may have their Well's score artificially lowered, since pre-existing respiratory disease provides an alternative explanation for increased dyspnea(4).

It is also important to consider conditions associated with existing comorbidities in presentations of acute chest pain. Given the history of COPD, a spontaneous pneumothorax or rib fracture caused by increased coughing are possible. Atelectasis and bullae formation in progressive COPD may contribute to a spontaneous pneumothorax, and a rib fracture must be included in the differential, especially considering the patient's history of osteoporosis. Both can be expected to present with dyspnea, decreased chest expansion, and pain

on inspiration, and both would require further imaging studies.

Furthermore, disorders of anxiety and depression commonly co-exist with COPD and can present with chest pain and dyspnea, similarly to progressive COPD or IECOPD. The symptom overlap and potential for anxiety to be triggered by COPD symptoms can make it difficult to distinguish the causative factor and may complicate the severity assessment of IECOPD. In this case the diagnosis of an acute panic attack is unlikely given the duration of the symptoms. Finally, gastrointestinal conditions such as reflux disease can be another cause of non-cardiac chest, although there were no associated gastrointestinal symptoms in this case.

Ultimately, the patient was diagnosed with IECOPD and required in-patient treatment as her symptoms evolved to include a purulent productive cough, and basal crepitations. Repeat chest X-ray and blood cultures were positive for consolidation and bacteremia, respectively. Consequently, this case raises two important points regarding the definition of IECOPD and GP evaluation of such a presentation.

IECOPD may present a diagnostic challenge especially considering the current, broad event-based definition of IECOPD in the 2019 GOLD guidelines as "an acute worsening of respiratory symptoms that result in additional therapy"(5). Recently a new symptom-based definition of IECOPD has been proposed including worsening dyspnea, which may or may not be associated with increased cough, sputum volume, or purulence (6). Ultimately, there is a need for specific clinical guidelines on identification and management of exacerbations.

This case illustrates how the symptom-based definition of IECOPD can be problematic, as the patient did not meet any of the symptom-based criteria at presentation to her GP. Such presentations pose a challenge for patient management, specifically deciding whether the patient can be adequately treated at home or whether further specialist care is required. Additionally, the use of resources and healthcare costs of referral must be balanced against the need to optimize patient outcomes and avoid treatment delays. This patient presented with sharp pleuritic chest pain, palpitations, and diaphoresis, which are concerning symptoms potentially signaling the need for urgent treatment. IECOPD mimic several conditions that must either be ruled out by the GP or acutely treated.

Finally, the National Early Warning Score (NEWS) system is used most commonly in inpatient settings for the early detection of patient deterioration. Although not its original intention, it has been suggested the calculating a pre-hospital NEWS may facilitate decision-making in regard to referrals to hospital and triage (7). By using a patient's vital signs and neurological status on their initial encounter with the GP, the GP may be able to better stratify their risk, communicate this information to emergency services and hospital teams, and contribute to improved triage of critical patients.

## Conclusions

This case illustrates an atypical presentation of IECOPD, with a chief complaint of acute chest pain, which diagnostically may be confused with several conditions that require emergent treatment. In the absence of typical IECOPD features, such as pyrexia, increased cough and sputum, diagnosis in a GP setting can be particularly difficult. The use of the NEWS tool in a pre-hospital setting could be especially useful in identifying an acutely deteriorating patient in such cases. Overall, this case highlights the diagnostic difficulty and uncertainty encountered by GPs when presented with patients experiencing atypical symptoms.

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