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Case Report

Internal Medicine Section

Stenotrophomonas maltophilia Pneumonia in a COPD Patient with Left Atrial Myxoma: A Case of Rare Clinical Presentation

RONAK PRAKASHKUMAR SHAH[1], PARTH ROHITKUMAR SHAH[2]

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ABSTRACT

Stenotrophomonas maltophilia (*S.maltophilia*) is an emerging multidrug-resistant pathogen, often implicated in respiratory infections in patients with chronic lung disease. The present case report presents a unique association between *S. maltophilia* pneumonia and an incidental left atrial myxoma, contributing to respiratory distress. Hereby, the authors present a case report of a 52-year-old male with Chronic Obstructive Pulmonary Disease (COPD) presented with bilateral lower limb oedema, progressive dyspnoea, productive cough, and intermittent fever for 15 days. Upon admission, he exhibited tachycardia, tachypnoea, and hypoxaemia (SpO_2 88% on room air). Chest examination revealed bilateral wheezing and crackles. Investigations showed leukocytosis, elevated inflammatory markers, and an abnormal chest X-ray with fibrotic changes and minimal pleural effusion. Echocardiography identified a 3.5 cm left atrial myxoma prolapsing into the mitral valve, along with severe pulmonary hypertension. Contrast-enhanced CT (CECT) confirmed the myxoma and revealed emphysematous and pneumonic changes. The patient was initially managed as a case of acute community-acquired pneumonia with acute decompensated heart failure using broad-spectrum antibiotics, bronchodilators, steroids, and diuretics. Due to respiratory distress and type 2 respiratory failure, Bilevel Positive Airway Pressure (BIPAP) support was initiated. Sputum culture identified *S. maltophilia*, which was sensitive to Trimethoprim-Sulfamethoxazole (TMP-SMX), leading to a targeted antibiotic regimen. The patient showed significant clinical improvement, allowing for weaning from BIPAP and oxygen support. Once stabilised, he was referred for surgical resection of the left atrial myxoma. The present case emphasises the importance of early recognition and targeted treatment of *S. maltophilia* pneumonia in COPD patients. Additionally, it highlights the role of comprehensive cardiovascular assessment in patients with persistent respiratory symptoms.

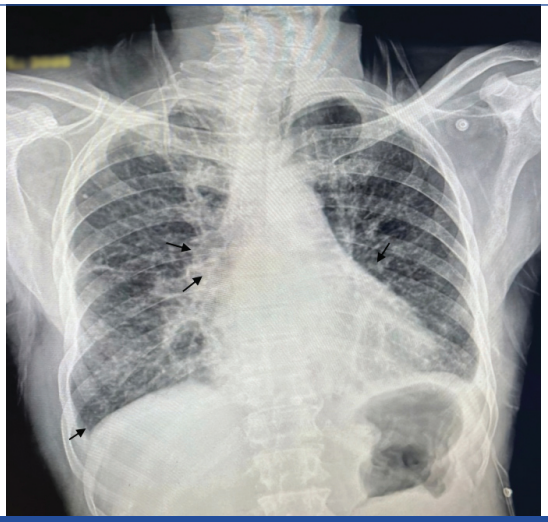
Keywords: Chronic obstructive pulmonary disease, Immunocompromised, Resistant pathogen

CASE REPORT

A 52-year-old male with a known case of COPD presented with bilateral lower limb oedema for one month, followed by progressive dyspnoea, productive cough, and intermittent fever for 15 days, leading to his admission to the critical care unit. On admission, he was experiencing tachycardia and tachypnoea, with an oxygen saturation of 88% on room air and blood pressure within the normal range. General examination revealed bilateral pedal oedema, and chest examination indicated bilateral wheezing and coarse crackles. The initial diagnosis included acute community-acquired pneumonia with acute decompensated heart failure.

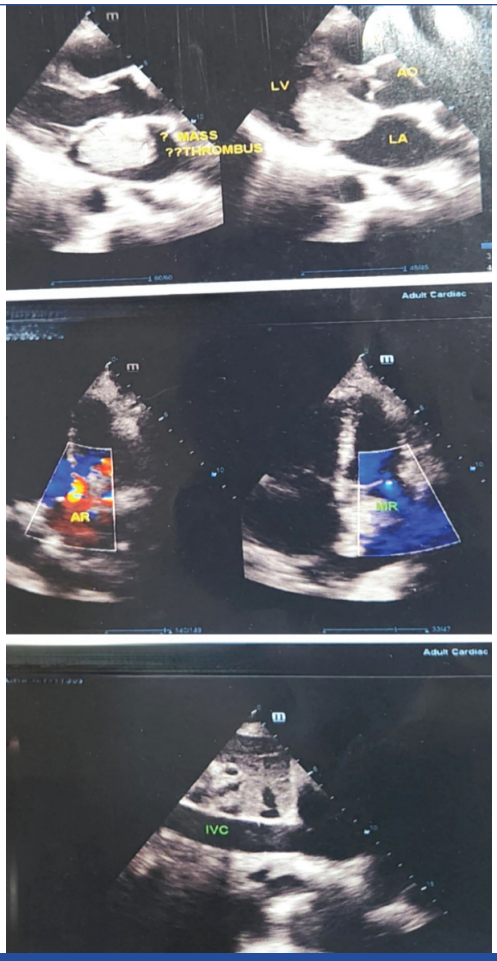
Laboratory investigations showed leukocytosis {total White Blood Cells (WBC) count: 13,000 cells/cubic mm) with elevated inflammatory markers (C-reactive protein: 50 mg/dL} and raised N-terminal pro B-type Natriuretic Peptide (NtProBNP). A chest X-ray revealed reticulonodular opacities with fibrotic changes involving the bilateral middle and lower lung fields, along with minimal right pleural effusion [Table/Fig-1]. Due to persistent dyspnoea, echocardiography was performed, revealing a 3.5 cm left atrial myxoma prolapsing into the mitral valve, as well as severe Tricuspid Regurgitation (TR) and severe Pulmonary Arterial Hypertension (PAH) [Table/Fig-2]. A CECT scan showed a heterogeneous low-attenuated area measuring approximately 3.9×5.3×3.9 cm in the left atrium, most likely a myxoma, with evidence of pulmonary hypertension. Additional findings included paraseptal emphysema with subpleural fibrotic changes in the bilateral upper lobes and patchy areas of consolidation and infiltrates, suggestive of left atrial myxoma with pneumonia [Table/Fig-3,4].

The patient was treated with broad-spectrum antibiotics, including cefepime-tazobactam and azithromycin, along with inhaled bronchodilators and steroids. Due to acute decompensated heart failure caused by the left atrial myxoma, diuretics were initiated. In response to respiratory distress and type 2 respiratory failure, the patient was initially managed with BIPAP support. Sputum cultures identified *Stenotrophomonas maltophilia*, which was sensitive to TMP-SMX, prompting targeted antibiotic therapy. The patient showed gradual clinical improvement, allowing for the progressive weaning of BIPAP support while maintaining adequate oxygen saturation with minimal oxygen supplementation.

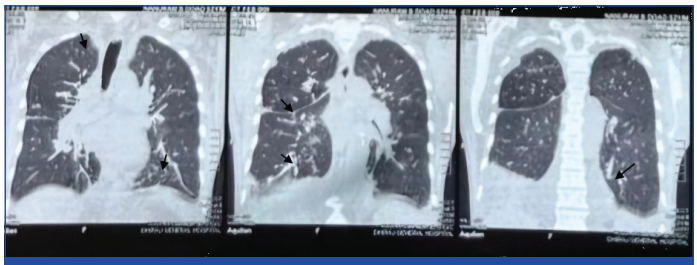


[Table/Fig-1]: Chest X-ray depicting reticulonodular opacities with fibrotic changes involving the bilateral middle and lower lung fields, along with minimal right pleural effusion.

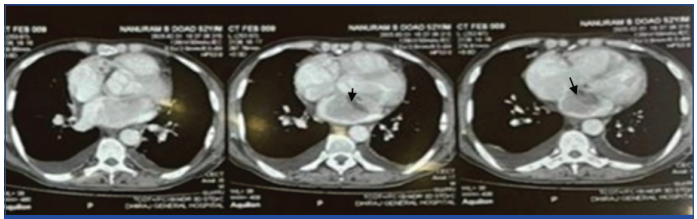
The cardiothoracic surgery team was consulted for myxoma evaluation, and surgical resection was planned after stabilisation of the respiratory condition. After seven days of antibiotic treatment, the patient exhibited stable vital signs and no longer required



[Table/Fig-2]: Echocardiography showing left atrial myxoma in left atrium protruding into left ventricle with severe Tricuspid Regurgitation (TR), severe Pulmonary Arterial Hypertension (PAH) and trivial Mitral Regurgitation (MR).
AO: Aorta; AR: Aortic regurgitation; IVC: Inferior venacava; LA: Left artrium; LV: Left ventricle; MR: Mitral regurgitation



[Table/Fig-3]: Contrast-enhanced Computed Tomography (CECT) thorax showing paraseptal emphysematous changes noted in apical segments of bilateral upper lobes, Interlobular septal thickening in right upper lobe with patchy areas of consolidation in apicoposterior segment of right upper lobe and diffuse scattered reticulonodular opacities involving bilateral lower lobes.



[Table/Fig-4]: The CECT thorax showing a heterogeneous low-attenuated area measuring approximately 3.9×5.3×3.9 cm in the left atrium, most likely a myxoma, with changes of pulmonary hypertension.

oxygen support. He was then transferred to the Cardiothoracic and Vascular Surgery Department (CTVS) for further management of the left atrial myxoma.

DISCUSSION

Stenotrophomonas maltophilia is a non fermenting, Gram-negative bacillus. It is a multidrug-resistant organism that is emerging in hospitalised patients, leading to increased morbidity and mortality [1]. The primary sources of this organism include water bodies, aquatic environments, and, in hospital settings, water sources, air cooling systems, dialysis machines, humidifiers, nebulisers, ventilator circuits, and dental equipment [2].

Predisposing factors include advanced age or neonatal status, immunocompromised conditions, prolonged hospitalisation, frequent hospital admissions, prolonged mechanical ventilation, long-term misuse of antibiotics, chronic lung diseases, COPD patients on chronic steroids, malignancy patients undergoing chemotherapy, organ transplant recipients, burn patients, people living with Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) People Living with HIV/AIDS (PLWHA) and chronic haemodialysis patients. *Stenotrophomonas maltophilia* pneumonia is rare but increasingly recognised in patients with chronic respiratory diseases [3].

The organism is resistant to multiple beta-lactams, aminoglycosides, quinolones, macrolides, and tetracyclines. The drug of choice for this infection is TMP-SMX, a bacteriostatic drug, administered at a dose of 15 mg/kg or more, with a susceptibility rate of approximately 90%. However, resistance to TMP-SMX is observed in 22-28% of cases. Alternative treatments include fluoroquinolones, which have a 90% susceptibility rate, high lung concentrations, and biofilm-specific properties that enhance drug efficacy. Other options, such as ceftazidime, ticarcillin-clavulanate, tigecycline, and minocycline, are effective in cases of TMP-SMX resistance [4]. The duration of antibiotic therapy is typically seven days but may be extended to 14 days based on the clinical condition and response to treatment [5].

In present case, the patient was initially treated with beta-lactams and macrolides but showed no clinical improvement. Following the results of a sputum culture, which identified *Stenotrophomonas maltophilia* sensitive to TMP-SMX, minocycline, and levofloxacin, the treatment was switched to TMP-SMX. The patient showed significant improvement after a seven-day course of TMP-SMX. The incidental finding of a left atrial myxoma further complicated the case, as it could contribute to embolic events and exacerbate respiratory symptoms. The present case highlights the importance of prompt microbiological diagnosis and targeted antibiotic therapy for optimal patient outcomes.

A similar finding of *Stenotrophomonas maltophilia* as a respiratory pathogen in chronic respiratory illness was observed in a case by Oladunjoye OO et al., [6]. In that case, an elderly woman with COPD and hypertension developed acute respiratory failure due to bronchitis/bronchopneumonia, with a sputum culture positive for *Stenotrophomonas maltophilia*. She was successfully treated with trimethoprim/sulfamethoxazole for 10 days and was subsequently discharged [6].

In a case reported by Sharma V et al., a 60-year-old male with underlying hypertension and diabetes experienced a persistent productive cough for six months, accompanied by intermittent fever and chills. Imaging revealed a large left-sided hydropneumothorax with cavitation, air-fluid levels, and multiple infiltrates. The patient was initially treated empirically with ceftriaxone and azithromycin but showed no improvement. Sputum culture identified *Stenotrophomonas maltophilia* sensitive to levofloxacin, minocycline, and TMP-SMX. Based on the culture report, the patient was treated with a 15-day course of levofloxacin (500 mg/day), leading to the successful resolution of symptoms [5].

Stenotrophomonas maltophilia is increasingly recognised as an opportunistic pathogen in immunocompromised individuals. Although it lacks inherent virulence, its ability to adhere to respiratory epithelial cells and medical device surfaces makes it a frequent coloniser in hospitalised patients. Its resistance to multiple drugs contributes to increased morbidity and mortality, particularly in patients with COPD, especially those in critical care units [7].

In a study by Calza L et al., a 10-year retrospective review of 1,374 HIV-infected patients identified 61 episodes of *Stenotrophomonas maltophilia* infection, with sepsis/bacteraemia being the most common presentation (78.7%). The majority (77%) were nosocomial infections, exhibiting high resistance to beta-lactams, aztreonam, imipenem, and aminoglycosides [8]. Conversely, in the study by Ronn C et al., an observational cohort study focused on 22,689 COPD outpatients in eastern Denmark found that 2.0% had *Stenotrophomonas maltophilia* in lower respiratory samples. The presence of *S. maltophilia* was associated with increased mortality {Hazard Ratio (HR) 3.3, 95% Confidence Interval (CI) 2.6-4.3} and higher hospitalisation rates for COPD exacerbations (HR 3.4, 95% CI 2.8-4.1) [9].

While Calza L et al., emphasised antimicrobial resistance and the nosocomial nature of infections, Ronn C et al., highlighted the impact of *S. maltophilia* on outpatient COPD patients' outcomes. This case report underlines the instance of *Stenotrophomonas maltophilia* pneumonia with decompensated heart failure in a COPD patient with a left atrial myxoma [8,9]. These findings suggest that, although *S. maltophilia* affects different patient populations, it remains a significant pathogen with distinct clinical implications.

CONCLUSION(S)

The present case highlights the importance of considering *Stenotrophomonas maltophilia* in pneumonia patients, particularly those with underlying lung disease. The co-existence of a left atrial myxoma underscores the need for a thorough cardiovascular evaluation in cases of unexplained respiratory distress. Therefore, patients with chronic lung illness require detailed evaluation and timely management to improve overall disease outcomes.

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PARTICULARS OF CONTRIBUTORS:
1. Assistant Professor, Department of Medicine, Smt. B. K. Shah Medical Institute and Research Centre, Sumandeep Vidyapeeth (Deemed to be University), Vadodara, Gujarat, India.
2. Senior Resident, Department of Anaesthesiology, Parul Institute of Medical Sciences and Research, Vadodara, Gujarat, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Ronak Prakashkumar Shah,
Assistant Professor, Department of Medicine, Smt. B. K. Shah Medical Institute and Research Centre, Sumandeep Vidyapeeth (Deemed to be University), At and Post Piparia, Taluka Waghodia, District Vadodara-391760, Gujarat, India.
E-mail: drronakshah88@gmail.com

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