CASE: Moderate COPD Exacerbation with Non-Invasive Management Challenges

Patient Identification:

The patient is a 46-year-old female named Jane Elizabeth Carter, NHS number 9876543210, residing at 25 High Street, Manchester, UK. She presented to the clinic on 18 December 2024, accompanied by her husband. Contact details include a mobile number 07123 456789 and email address jane.carter@example.com. She is registered with Dr. Sarah Adams at Highfield Medical Practice, Manchester. The patient works as a primary school teacher and is covered under the NHS healthcare plan. Her next of kin is her spouse, Mark Carter. No accessibility requirements or language barriers are noted. She has provided consent for electronic health communication.

Presenting Complaints:

The patient reports experiencing persistent dyspnoea on exertion for the past three weeks, progressively worsening to interfere with daily activities. Associated symptoms include intermittent, non-productive cough and occasional wheezing, primarily during nighttime. She describes a sensation of chest tightness, particularly after minimal physical activity. The patient denies fever, chills, or hemoptysis but mentions generalized fatigue and reduced exercise tolerance. She also reports mild peripheral oedema in the lower extremities over the past week. No recent history of upper respiratory tract infection or exposure to allergens is noted. The patient denies orthopnoea or paroxysmal nocturnal dyspnoea but expresses concern about unintentional weight loss of approximately 3 kg in the last month. She has been using over-the-counter analgesics for intermittent musculoskeletal pain but denies relief of respiratory symptoms with these. Her symptoms have progressively escalated despite self-imposed rest and increased fluid intake, prompting her to seek medical evaluation.

Primary Diagnosis:

The primary diagnosis for Jane is Chronic Obstructive Pulmonary Disease (COPD), exacerbated by environmental factors and potential early-stage chronic bronchitis. Her clinical presentation of progressive dyspnoea, non-productive cough, and chest tightness is consistent with obstructive airway pathology. Spirometry is recommended to confirm airflow limitation, and arterial blood gas analysis may be necessary to assess oxygenation.

Medical History:

Jane has a history of mild seasonal asthma diagnosed during adolescence, which resolved without ongoing treatment. She denies any prior hospitalizations or surgeries. She has no documented history of cardiovascular, renal, or hepatic conditions. She reports occasional use of paracetamol for mild headaches and takes no regular medications. Jane is a non-smoker and denies any history of alcohol or illicit drug use. Her family history is unremarkable for chronic diseases. Her BMI is within the normal range, and she reports being physically active prior to the onset of symptoms.

Pre-Procedure:

Consent: Informed consent for the procedure, including detailed discussion of potential risks, benefits, and alternative treatments, was obtained. A pre-procedural time-out was conducted to confirm the patient's identity, procedure details, and relevant medical history. Standard preprocedural assessments, including vital signs, oxygen saturation, and spirometry, were performed, and the patient was positioned comfortably to ensure airway stability during the procedure.

Preparation:

The site was prepared and draped using maximal sterile barrier techniques, including cutaneous antisepsis with chlorhexidine. Sterile instruments and equipment were arranged, and all necessary medications were verified for availability. The WHO Surgical Safety Checklist was completed, ensuring adherence to safety protocols. Monitoring devices for oxygen saturation and heart rate were calibrated and applied.

Procedure:

The procedure involved nebulized bronchodilators (salbutamol and ipratropium bromide) administered under monitoring to relieve acute dyspnoea. Oxygen therapy was initiated via nasal cannula at 2L/min to maintain oxygen saturation above 94%. Arterial blood gases were closely monitored during treatment, and no significant desaturation or hypercapnia was observed. The patient also received a single dose of intravenous corticosteroid (hydrocortisone 100mg) to reduce airway inflammation. No invasive interventions were performed. Jane tolerated the therapy well, and symptoms showed mild improvement post-treatment.

Post-procedure:

Jane remained under observation for 6 hours following bronchodilator therapy. Her oxygen saturation stabilized at 96% on supplemental oxygen. Repeat physical examination showed reduced wheezing and improved breath sounds. No adverse reactions to the corticosteroid or nebulized medication were observed. Spirometry confirmed moderate airflow obstruction consistent with COPD. Jane was discharged with instructions for inhaler use, including a combination of long-acting beta-agonist and corticosteroid, and provided a rescue inhaler for acute episodes. She was counseled on lifestyle modifications, including avoiding triggers like smoke and dust.

Relevant Investigations & Results:

Spirometry revealed a forced expiratory volume in 1 second (FEV_1) of 60% predicted, confirming moderate airflow obstruction consistent with COPD. Chest X-ray showed hyperinflation of lung fields without focal consolidation, pneumothorax, or effusion. Arterial blood gas analysis indicated mild

hypoxemia with a PaO_2 of 68 mmHg on room air and normal $PaCO_2$. Complete blood count (CBC) was unremarkable, and C-reactive protein (CRP) was within normal limits, ruling out significant infection.

Follow-up Plan:

Jane was scheduled for a follow-up visit with her respiratory specialist in two weeks to reassess symptom management and response to inhaler therapy. A chest X-ray and repeat spirometry were planned to monitor her condition. She was referred to a pulmonary rehabilitation program to improve lung function and exercise tolerance. Smoking cessation counseling was not required, as she is a non-smoker. Jane was advised to contact her GP immediately if symptoms worsened or if she experienced new symptoms such as fever or chest pain.