Respiratory Distress in a Patient With Multiple Myeloma

D.O., a 35-year-old female with refractory multiple myeloma, was admitted to the hospital with increasing muscle weakness. On day three of hospitalization, she started to experience mild, occasional wheezes and was started on 2.5 mg ipratropium via a handheld nebulizer every six hours as needed. A chest x-ray revealed some segmental atelectasis in D.O.'s left lower lobe.

The following day, D.O. called the nurse into her room and complained of an itching and irritated throat. On examination, the RN observed a continuous nonproductive cough, bilateral rhonchi with occasional wheezes, cold and clammy skin, and agitation; then, the patient complained that she could not breathe. The RN administered 4 L oxygen via nasal cannula and noted an oxygen saturation of 99% on pulse oximetry. The patient’s temperature was 98.8°F, her pulse was 96 and regular, respirations were 22, and her blood pressure was 116/88. A respiratory therapist initiated a breathing treatment with the administration of 0.5 mg ipratropium, and the medical doctor (MD) on call was notified. The MD ordered 1 mg lorazepam via IV push and the respiratory therapist, who administered, noted a decrease in respiratory distress.

D.O. demonstrated clinical improvement within one hour with decreased shortness of breath and improved oxygen saturation of 97% on decreased 5 L of oxygen. The etiology of this respiratory distress remained uncertain but the possibilities included anxiety or pulmonary emboli. The MD ordered a lung scan, bilateral lower extremity venous Doppler readings, and continuation of the furosemide and ipratropium that had been prescribed on the previous day after evaluation of the patient’s chest x-ray findings. Lorazepam for anxiety was prescribed as needed. The lung scan and venous Doppler studies were negative, which ruled out pulmonary emboli as a likely cause of the respiratory distress.

The next day, D.O. once again experienced increasing respiratory distress, which was unrelied by administration of furosemide, lorazepam, and 100% oxygen through a nonbreather mask. Her vital signs were pulse 140–160, respirations in the 30s and labored, and blood pressure 150/80. Her blood gases were pH 7.36, pCO₂ 55, pO₂ 120, HCO₃ 31.6, and 98% oxygen saturation. A respiratory treatment with ipratropium was administered. The primary MD transferred the patient to the intensive care unit and ordered a computerized tomography (CT) of the chest.

The chest CT revealed near obstruction of the trachea about 2 cm below the vocal cords, as well as at the level of the carina, by plasmacytomas. One of the tumors occluded about 90% of the lumen of the trachea. Respiratory support was initiated consisting of bilevel positive airway pressure treatments with the goal of maintaining oxygen saturation greater than or equal to 93%. Dexamethasone was increased from 2 mg to 6 mg IV every eight hours. The patient’s chemotherapy agent, 300 mg oral thalidomide daily, was continued. D.O. quickly was scheduled for laser excision of the tumor masses via rigid bronchoscopy. The patient was kept in the intensive care unit for an additional day for close observation of respiratory status. She remained stable with oxygen saturations more than 90% on room air and had a radiation consult four days post-surgery. Radiation to the tracheal area was planned.

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Clinical Problem Solving

Responding to this clinical challenge are Lilia Frausto, RN, BSN, CCRP, and Stephen Lim, MD. Frausto is a clinical program coordinator and Lim is an associate director, both in the Blood and Marrow Transplant Program at Cedars-Sinai Medical Center in Los Angeles, CA. Frausto is completing the master’s oncology nurse practitioner program in the School of Nursing at the University of California, Los Angeles.

What should be assessed in patients with multiple myeloma?

S. Lim: Assessments on the original diagnosis of multiple myeloma should include the type of myeloma present: IgG, IgA, IgM, or IgD. The physician also should quantify the amount of immunoglobulin and order a bone marrow biopsy to determine the percent of marrow involvement. Kidney and liver function and electrolyte levels, particularly calcium, should be assessed. Patients with multiple myeloma may be anemic; therefore, a complete blood count also is indicated. Clinically, healthcare providers should determine whether patients have any specific bone pain that may be caused by an underlying lytic bony defect.