When Obstruction Meets Infection: A Rare Case of Multidrug Resistant *E. Coli* Pneumonia in Metastatic Melanoma

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Abstract

Multidrug resistant *Escherichia Coli* (MDR *E. Coli*) is a rare cause of bacterial pneumonia. We present a case of MDR E.Coli pneumonia diagnosed on culture of broncholaveolar lavage specimens (BAL) after bronchoscopic debulking of a metastatic melanoma mass completely obstructing the left main stem bronchus (LMSB).

Methods

75-year-old male with presented to the ED with respiratory distress and fevers. He had a known history of metastatic melanoma with an obstructive mass in the LMSB. Initial work up revealed radiologic evidence consistent with pneumonia (Figure 1). Initial treatment with intravenous cefepime and vancomycin was initiated, followed by bronchoscopic debulking with lavage 2 days later.

The metastatic melanoma mass occluding the LMSB was approximately 3-cm from the carina (Figure 2) and projected into the lumen via a basilar stalk. Once the tumor was debulked from the lower lobe area all 4 segments of the left lower lobe were appropriately ventilated. BAL of the lower left lobe collected purulent secretions and were sent for culture (Figure 2). After the procedure, he had symptomatic improvement in his dyspnea by the next morning. Heavy growth of MDRE. Coli was found on BAL culture, with susceptibilities only to Meropenem, Ertapenem, and Amikacin (Figure 3). He was treated with a 10-day course of 1g IV Ertapenem daily and responded well.

Figures

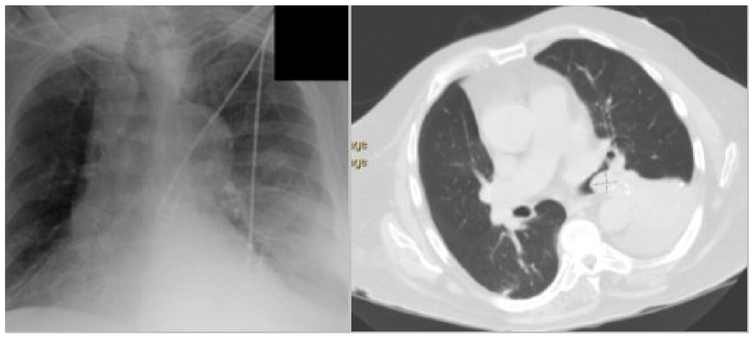

Figure 1: Chest X-ray demonstrating pulmonary consolidation of left lower lung field with signs of possible pleural fluid collection. CT chest revealed left lower lobe post obstructive pneumonia secondary to an endobronchial lesion at the level of the left main bronchus bifurcation

Figure 2: Left: initial visualization of metastatic melanoma obstruction taken during tumor debulking. Right: View of Left upper lobe after major tumor debulking. Note the pale, purulent quality of the airway distal to the now removed obstruction.

Susceptibility

	Escherichia coli (MDRGN) MIC
Amikacin	Susceptible
Ampicillin	Resistant
Ampicillin + Sulbactam	Resistant
Aztreonam	Resistant
Cefazolin	Resistant
Ceftriaxone	Resistant
Ciprofloxacin	Resistant
Ertapenem	Susceptible
Gentamicin	Resistant
Levofloxacin	Resistant
Meropenem	Susceptible
Piperacillin + Tazobactam	Resistant
Tetracycline	Resistant
Tobramycin	Resistant
Trimethoprim + Sulfamethoxazole	Resistant

Figure 3: Susceptibility report for E Coli growth found distal to obstructive metastatic melanoma

Discussion

Globally, community acquired pneumonia is responsible for more than 3 million deaths a year. Despite its common incidence, the etiology of CAP is unknown in approx. 50% of cases (1, 2). *Streptococcus*, *Haemophilus Influenza*, *Staphylococcus aureus*, *Mycoplasma pneumoniae*, and *Moraxella Catarrhalis* are the most commonly identified bacterial causes. *E. Coli* is an uncommon cause of CAP and MDR *E. Coli* is extremely rare, with only a few case reports noted in our literature search.

E. Coli is a facultative anaerobe, thriving in the anaerobic environment of the gut or urinary tract. An altered, obstructed, poorly oxygenated bronchial environment from the metastatic melanoma mass likely played a role in E. Coli overgrowth noted in our patient and the broad-spectrum antibiotics prior to debulking may have also contributed to the overgrowth of this MDR organism by eliminating other more susceptible organisms.

A prior case report on E.coli pneumonia also described similar circumstances with an obstructed airway from tracheomalacia and broncholithiasis. (3) This case report along with ours suggests the likely role of a low oxygen environment in E.coli infection. Rare case reports also show $_{\text{E. coli}}$ isolated from cavitary lesions, further suggesting that its growth is associated to an altered or obstructed pulmonary environment. (4)

For patients with post-obstructive pneumonia, E.Coli may represent a rarely considered source of pneumonia. Expansion of empiric antibiotic regimen to cover E.Coli should be considered in cases where a suitable clinical response is not seen. Additionally wherever feasible, early bronchoscopic or surgical intervention should be considered to relieve the obstruction and allow for the return of the airway microbiome to physiologic conditions.

Acknowledgements

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References QR code