

## Case Report

# A 56-year-old man with necrotizing pneumonia multidrug-resistant successfully treated surgically

*Pneumonia necrotizante por microrganismo multidroga-resistente em paciente de 56 anos*

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### ABSTRACT

Pneumonia caused by multidrug-resistant pathogens is increasing, and these infections are negatively associated with patient outcomes. Optimization of antibiotics has been suggested as a key intervention to improve clinical results, however what to do when there is no antibiotic treatment available? This case reports a 56-year-old man who developed necrotizing pneumonia due to multidrug-resistant *Acinetobacter baumannii* after infection with SARS-COV-2 and the use of high doses of corticosteroids. Video-assisted thoracoscopic surgery has been established as an effective and potentially less morbid alternative to open thoracotomy.

**Keywords:** Pneumonia; Thoracic surgery, video-assisted; Covid-19

### RESUMO

A incidência de pneumonia causada por microrganismos multidroga-resistente está aumentando, e essas infecções se associam negativamente aos desfechos dos pacientes. Antibióticos com espectro cada vez mais amplos são uma intervenção-chave para melhorar os resultados clínicos, mas o que fazer quando não há tratamento antibiótico disponível para um microrganismo específico? Este é um relato de caso de um paciente do sexo masculino de 56 anos com sepse por pneumonia necrosante por *Acinetobacter baumannii* multirresistente após infecção por SARS-COV-2 e uso de altas doses de corticosteroides. A videotoracoscopia tem sido estabelecida como alternativa eficaz e potencialmente menos mórbida à toracotomia aberta, mas sua utilização para controle de foco infeccioso em paciente séptico por pneumonia necrotizante por microrganismos multidroga-resistente ainda é pouco discutida.

**Descritores:** Pneumonia; Cirurgia torácica videoassistida; Covid-19

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## BACKGROUND

Pneumonia caused by multidrug-resistant pathogens is increasing, and these infections are negatively associated with patient outcomes.<sup>1</sup> Optimization of antibiotics has been suggested as a key intervention to improve clinical results,<sup>1</sup> however what to do when there is no antibiotic treatment available?

Video-assisted thoracoscopic surgery (VATS) has been established as an effective and potentially less morbid alternative to open thoracotomy. Although, the role and timing of VATS with pulmonary resection for multidrug resistant pneumonia is not clear.<sup>2,3</sup>

## CASE REPORT

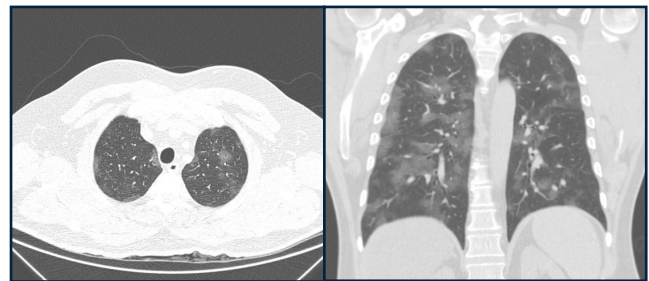
A 56-years-old male from São Paulo, Brazil, presented to the Emergency Department with complaints of cough and fevers. On arrival, the patient was uncomfortable, tachypneic and in mild respiratory distress. Auscultation of his chest revealed scattered bilateral crackles and mild end-expiratory wheezing but no egophony. A chest computed tomography (CT) on the day of presentation demonstrated interstitial pneumonia (**Figure 1**), and respiratory viral panel was positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The patient was given intravenous ceftriaxone (2,000 mg) for 3 days and admitted to the intensive care unit (ICU).

During a 10-day hospitalization, the patient demonstrated significant clinical improvement, including resolution of fever and respiratory distress. Eleven days after admission, the patient had a recurrence of fever associated with shaking chills. He received 2 days of intravenous methylprednisolone (500 mg/dose). A new chest CT revealed a necrotizing pneumonia in the right upper lobe and his cultures were positive for *Acinetobacter baumannii* multidrug-resistant (**Figure 2**).

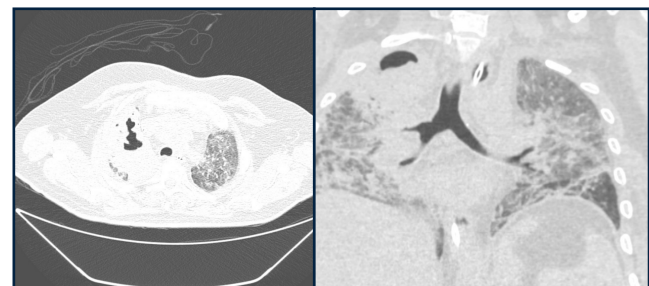
The patient was initially treated with antibiotics, but early on surgery was chosen. The deciding factor for performing resection of consolidated lung tissue was treatment failure, i.e., the overall

deterioration of the patient's condition despite antibiotic treatment with meropenem, vancomycin and colistin, manifested by persistent septic shock and multiple organ failure.

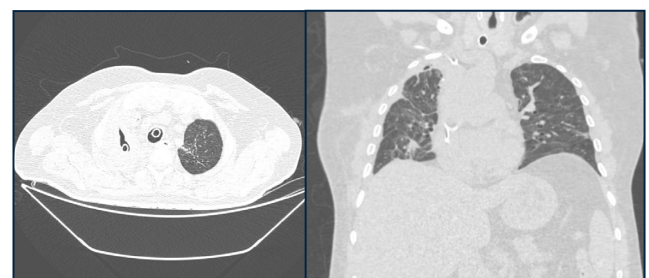
He underwent a wide wedge resection planned to remove the most destroyed of the right upper lobe by two-portal VATS, one chest drain was inserted. The postoperative control chest CT shows complete removal of the target area (**Figure 3**). Chest drain was removed on post-op day 10 due to prolonged air leak. The recovery was uneventful and was discharged on post-op day 20.



**Figure 1.** Additional chest computed tomography in axial and coronal view with interstitial pneumonia.



**Figure 2.** Chest computed tomography in axial and coronal view with necrotizing pneumonia.



**Figure 3.** Chest computed tomography in axial and coronal view in post op 7.

## DISCUSSION

Although infrequently assessed, antimicrobial resistance is highly prevalent in patients with coronavirus disease 2019 (Covid-19) and bacterial infections.<sup>4</sup> A systematic analysis published in 2022 suggested that 0,9 to 1,7 million deaths were attributable to bacterial antimicrobial resistance in 2019, which would make resistance one of the leading causes of mortality globally.<sup>5</sup>

World Health Organization (WHO) has identified a list of priority bacterial pathogens that are of public health importance and for which new and effective antibiotic treatments are urgently needed because of antimicrobial resistance, including carbapenem-resistant *A. baumannii*.<sup>6</sup>

Necrotizing pneumonia represents a spectrum of parenchymal destruction and has been characterized radiographically by findings of consolidated lung with peripheral necrosis and multiple small cavities and may be rapidly progressive.<sup>3</sup>

It is difficult to decide which patients of necrotizing pneumonia would need surgery and which one could be managed by medical management. However, accepted indications for surgical resection of pulmonary parenchyma in necrotizing lung infections include massive non-response to medical therapy with progressive parenchymal destruction.<sup>7</sup>

Surgery has two principal aims. The first is to manage concomitant pleural disease. The second is managing progressive lung parenchymal necrosis, which involves segmental or lobar resection or pneumonectomy.<sup>8</sup>

Surgical intervention with either VATS or mini-thoracotomy to debride pyogenic material around the lung (decortication), breakdown loculations, and remove pus may be required.<sup>8</sup> Prolonged air leak is frequent complication<sup>7</sup> and can cause the necessity of a second intervention. The use of automatic suture (staples), whenever possible is recommended as a measure to prevent it.

We reported a case of a post-Covid-19 patient with necrotizing pneumonia for *A. baumannii* resistant to carbapenems and aminoglycosides with successful surgical treatment.

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