Case Report

Necrotizing pneumonia or pulmonary gangrene

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ABSTRACT

We present the case of necrotizing pneumonia in a young patient without chronic comorbidities, who presented a torpid with subsequent death, highlighting in this case, subacute evolution, as well as the isolation of *Staphylococcus epidermidis* coagulase-negative resistant to vancomycin, acquired in the community, which finally resulted in a poor prognosis. The importance of the tomographic image is emphasized, as well as the evaluation for chest surgery, as it is important invasive surgical management or chest, coupled with broad-spectrum drugs according to targeted crops or pleuropulmonary expectoration secretions.

Key words: Coagulase-negative, necrotizing pneumonia, staphylococci epidermidis

INTRODUCTION

Necrotizing pneumonia refers to the development of necrosis, liquefaction, and cavitation of the pulmonary parenchyma by an infectious pathogenic agent, which has also been referred to as pulmonary gangrene, due to the events of pulmonary tissue lysis. It is said that approximately 4% of community pneumonia are necrotizing, although this percentage seems to increase. Clinical pictures, as expected, are more aggressive, often coexisting with parapneumonic effusion, empyema, or bronchopleural fistulae.[1]

There are some factors that lead to necrosis of the pulmonary parenchyma, such as the staining of Pantano-Valentine's leukocidin-producing *Staphylococcus aureus*, which have a greater virulence and therefore a greater affect on the tissue they infect. Similarly, there are other strains of high virulence demonstrated as the strain USA300, which has been associated with some cases of necrotizing pneumonia.[2-4]

The etiological agents mainly involved are often coccus, predominantly *Staphylococcus* and of these, methicillin-resistant *S. aureus* has a higher incidence. However, other agents other than cocci have recently been implicated, with *Pseudomonas Aeruginosa* being mentioned as an additional germ, with the particularity of affecting the apical regions. Given the above, it is recommended to target antimicrobial management with coverage for methicillin-resistant Gram-positive cocci (glycopeptides or oxazolidinediones), although an initial Gram-staining in sputum could target other germs such as Pseudomonas.[5]

CASE REPORT

We present the case of a 26-year-old male patient who was admitted for fever, cough and right pleuritic chest pain of 20 days of evolution, early treated by physicians with various antimicrobial regimens (amoxicillin, ceftriaxone) without improvement. Within his clinical history, he only emphasized

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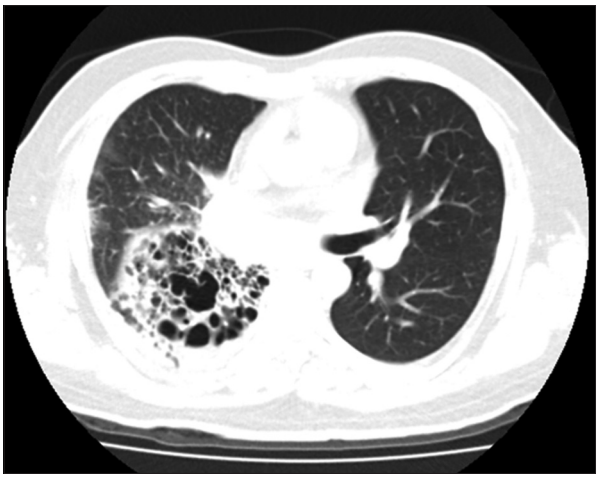

Figure 1: Axial cut, right posterobasal necrotizing pneumonia, multiple cavitations inside the parenchyma

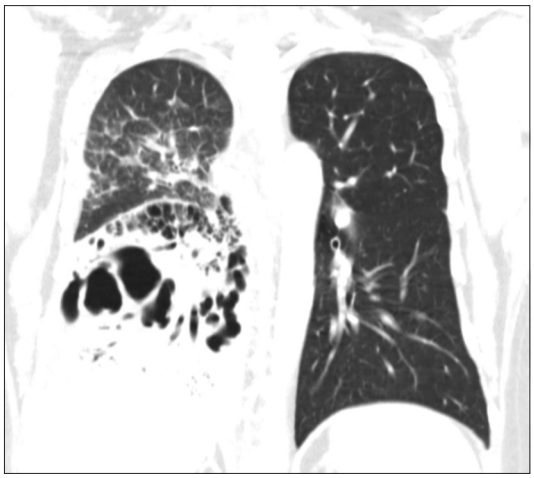

Figure 2: Frontal cut, necrotizing pneumonia is seen in 70% of the right lung parenchyma, classic microcavitations of necrotizing pneumonia

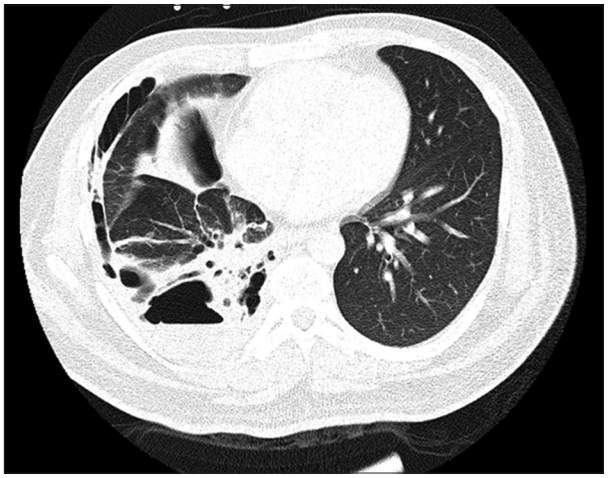

Figure 3: Control tomography, 6 days of hospitalization, demonstrates torpid evolution with formation of major cavitations and hydroaeal levels, as well as the involvement of the pleural space with formation of septa and trabeculae, large lysis of lung tissue

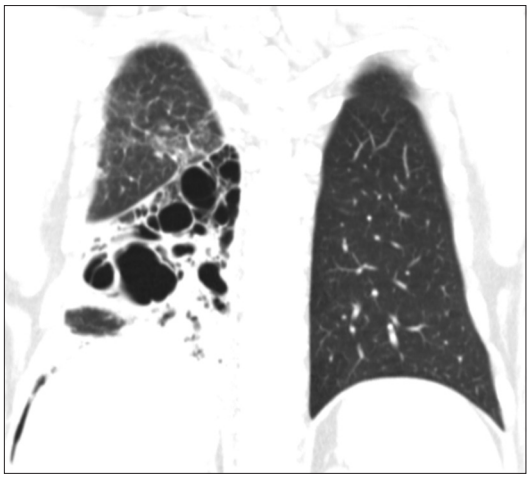

Figure 4: Frontal cut, 6 days after admission, showing large cavitations by lysis of the lung parenchyma, with severe pleural involvement

sequels of electric burn in hands. Management was started with levofloxacin in the emergency room.

On arrival, the chest radiograph showed a presence of a zone of the right basal consolidation within which areas of cavitation were appreciated. A pulmonary computed tomography scan was performed, which demonstrated the right lung involvement of 70% with diffuse cavitary lesions and air bronchogram [Figures 1 and 2], Compatible with necrotizing pneumonia, and hence that management with imipenem/vancomycin was adjusted; We started protocol where the basic paraclínicos highlighted leucocytosis 13,500/mm^3, without renal, hepatic, or hematological injury. Serial bacilloscopies were requested, being negative (six in total). Sputum culture reported vancomycin-resistant coagulase-negative *Staphylococcus epidermidis*; The evolution was torpid, a second pulmonary tomography was determined 6 days after the previous one, which demonstrated destruction of the pulmonary parenchyma, simulating a pneumothorax, with involvement of the pleural cavity, which had multiple septa and a collection with hydroaereus level in lobe lower right lung [Figure 3 and 4]. Despite the adjustment of the linezolid treatment, the patient was referred to chest surgery with such findings, however, the prognosis was poor due to septic shock and delayed surgical treatment, since he was treated conservatively by this service (for suspected pulmonary tuberculosis with six negative bacilloscopies), with the subsequent death of the patient.

DISCUSSION

The present case is of relevance, since it was a torpid evolution with a pulmonary necrotizing picture that tended to be subacute and with a germ that increasingly conditions severe pictures, becoming this group (coagulase negative) in true nosocomial emergencies, Their own bacteriological characteristics (formation of biofilms that confer bacterial

resistance and resistance *per se* to vancomycin) can condition severe pictures such as the present. Likewise, necrotizing or pulmonary "gangrene" pictures are rare, but when present they have high morbidity and mortality and poor prognosis. It is recommended before these severe cases, start of broad-spectrum antimicrobials, as well as to request simple and contrasted tomographic imaging studies, with the intention of having an accurate diagnosis, being superior to the simple radiology of the thorax, and the evaluation of chest surgery, since bronchoscopy, debridement, decortication, thoracotomy, lobectomy, and/or thoracoscopy may be important, according to each particular case, and the prognosis can be improved with the initial surgical management. The present case should have been subjected to extensive debridement of the necrobiotic pulmonary tissue to delimit the state of sepsis and to continue the adequate antimicrobial management (linezolid), we consider that valuable time was lost in trying to rule out pulmonary tuberculosis, having evidence of same.[6,7]

It is also commented that the tomography must be contrasted as this helps to diagnose pulmonary gangrene, being the criteria: obliteration of the pulmonary artery of the affected segment demonstrating null tissue circulation and the lack of contrast medium uptake in the affected segment above 50% of it. All the above supports an immediate surgical treatment, mentioning that thoracentesis or pleurostomies are not useful, a broad debridement of devitalized tissue is required in open or thoracoscopic way. Therefore, necrotizing pneumonia should be treated in a multidisciplinary manner, in an intensive care unit, with contrast tomographic assessment and surgical evaluation at the earliest, in case of failure of adequate medical treatment, to reduce morbidity and mortality due to this cause.[8,9]

It has recently been mentioned that the pharmacological group of oxazolidinediones, emphasizing linezolid, given that there is increasing resistance to vancomycin and other glycopeptides, is indicated in the cases of necrotizing pneumonia, given the high incidence of cases associated with cocci, mainly *S. aureus*, and in this respect there is another drug of this group, which has been proposed as a first-line agent, since it has been shown to suppress the production of staphylococcal toxins such as alpha protein and Panton-Valentine leukocidin, this being tedizolid, which hopes to consolidate itself as a first-line agent in these cases, even in the current stage of experimentation.[10]

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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