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Atypical Pneumonia in Patient with *Serratia odorifera*: A Rare Association

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Abstract

Serratia odorifera, a member of the Enterobacteriaceae family, was first described in 1978 by Grimont et al. Although, *Serratia marcescens* is a well-known and most commonly isolated pathogen, other species such as *S. odorifera* are rarely isolated and seldom cause infection in humans. This clinical case emphasizes a rare association of *S. odorifera* infection with diffuse pulmonary involvement. Clinical cases that report this association are rare. The isolation of this agent in respiratory secretions should not be considered colonization but should be interpreted in the clinical context of the patient.

Keywords: *Serratia odorifera*; Atypical pneumonia; Ground-glass opacification

Introduction

Serratia is a gram-negative bacterium and a member of the Enterobacteriaceae family. *Serratia marcescens* is a well-known and most commonly isolated pathogen, but other species such as *S. liquefaciens*, *S. filcaria* and *S. odorifera* also can be identified but rarely cause infection in humans [1].

In a screening conducted by the European Centre for Disease Prevention and Control, Serratia infections were responsible for 3.4% of all microorganisms isolated from community-acquired pneumonia admitted to intensive care units [2].

Serratia odorifera was first described in 1978 by Grimont et al, who described it as a saprophytic bacterium that essentially colonizes the respiratory tract [3]. The first case with confirmed infection was described in 1988 in a 67-year-old patient with cirrhosis of alcoholic etiology, admitted by septic shock, with isolation of *S. odorifera* in blood and urine [4]. *S. odorifera* has also been described in other case reports as an occasional etiology of serious and eventually fatal infections, especially in patients with chronic pathologies and immunosuppressed.

We report the case of a patient, without known diseases, who developed community- acquired pneumonia caused by *S. odorifera*.

Case Presentation

A 25-year-old female Caucasian patient, dentist, non-smoker, who lived in a recently renewed basement with windows to the outside, had only a history of appendectomy at age 12. No medication or allergies were documented. She started a 3-month course characterized by cough with purulent and sometimes hemoptoic sputum, fever, night sweats, progressive worsening of fatigue and weight loss (approximately 10 kg in 3-months).

She went to the emergency department several times and underwent several antibiotic regimens with azithromycin and amoxicillin/ clavulanic acid, and in the absence of clinical improvement she was observed in a pulmonology appointment.

From the etiological investigation we highlight; **(1):** analytically, there was only an increase in inflammatory parameters but without autoimmune changes or immunodeficiencies detection; **(2):** chest radiograph showed an accentuation of the reticulum but no image of condensation (Figure 1); **(3):** Computed Tomography of the chest (CT) demonstrated diffuse infiltrate with bilateral ground-glass pattern (Figure 2A and 2B); **(4):** videobronchofibroscopy did not document endoscopic changes (Figure 3), bronchoalveolar lavage showed lymphocytosis (70%) and isolation of *S. odorifera* in lavage and transbronchial biopsies. No positive PAS lipoprotein material was observed and hemosiderophage testing was negative. The mycological and mycobacteriological examination, as well as the study of Galactomannan and Pneumocystis jirovecii were also negative. Histopathological examination demonstrated nonspecific lymphocytic inflammatory infiltrate, with aspects of organizing pneumonia. Pneumonia was admitted to *S. odorifera* and co-trimoxazole (1 pill every 12 hours) was started according to sensitivity test. She completed 21 days of therapy with a clinical and imaging improvement, with a control CT showing a marked reduction of the ground-glass opacities.

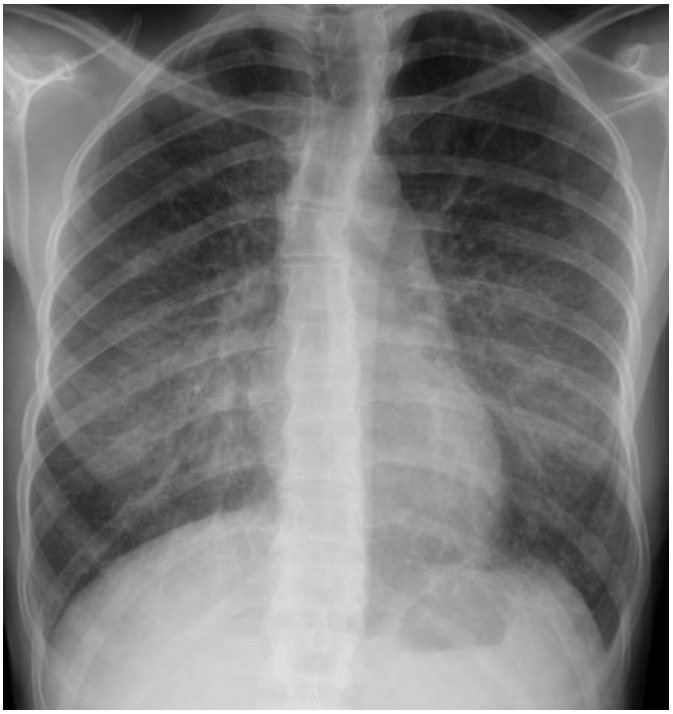
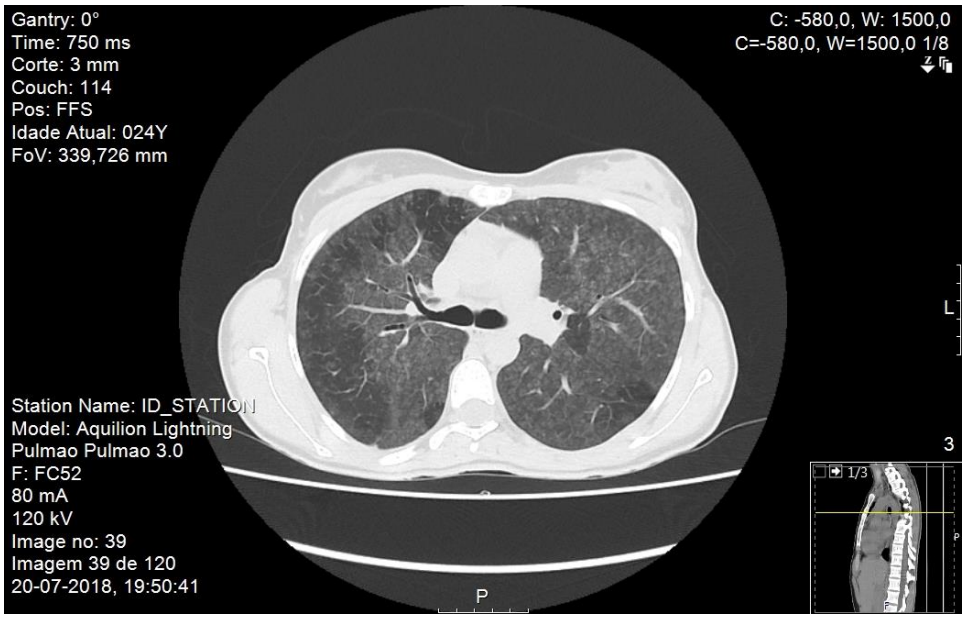


Figure 1: Chest radiograph showing an increase in the pulmonary reticulum.

A



B

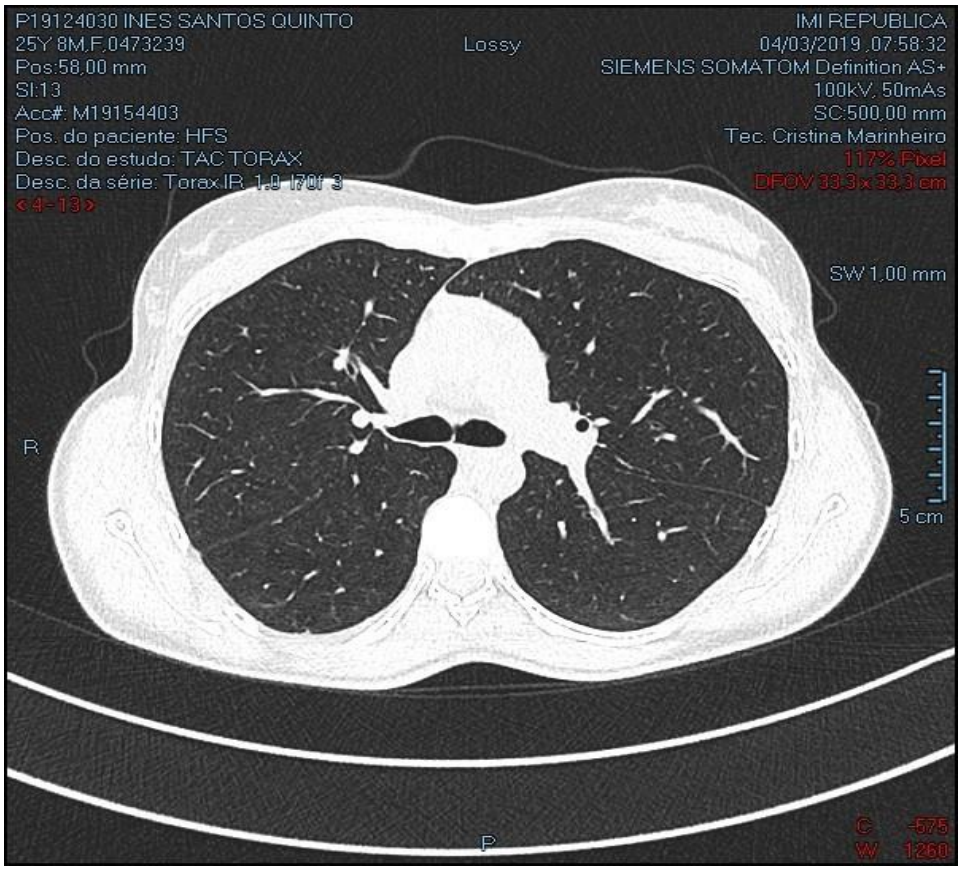


Figure 2: Imaging evolution observed in CT. Findings of bilateral infiltrate with ground-glass pattern in **(A):** and imaging improvement in **(B):** observed after 8 months are evident.

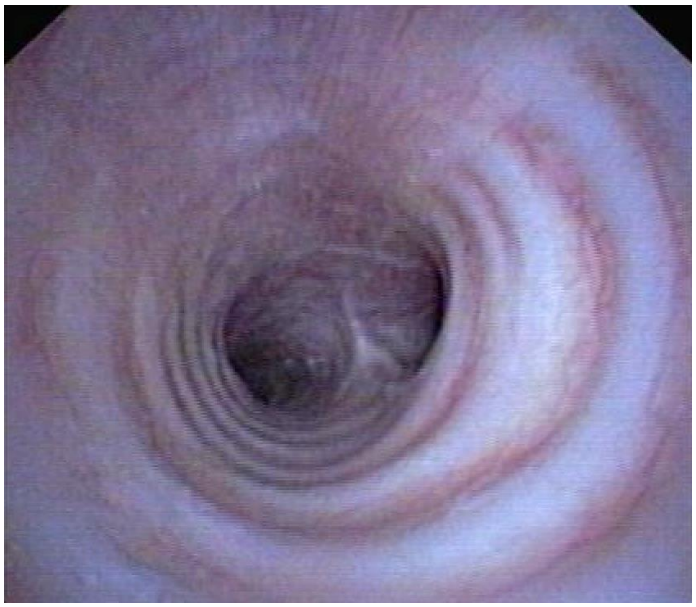


Figure 3: Normal endoscopic findings in the videobronchofibroscopy.

Discussion and Conclusion

Serratia odorifera is normally a non-pathogenic organism that often colonizes the airways and food [3]. However, the isolation of this agent must be interpreted in the patient's clinical context, since there are reports of infections by this strain.

So far, only 18 cases of *S. odorifera* infections have been described in the literature, of which eight have occurred in children due to contamination of parenteral nutrition and the rest in adults undergoing invasive procedures (for example, central venous catheter placement) or with comorbidities such as chronic liver disease, diabetes mellitus, splenectomized patients or chronic kidney disease, which involved constant contact with the hospital environment [4-11].

The case we report is therefore the first infection with *Serratia odorifera* acquired in the community and in a patient without comorbidities or risk factors. As in the aforementioned cases, there was a good response to the correct antibiotic therapy and with good clinical and imaging recovery.

Although the majority of infections by Serratia, namely *S. odorifera*, are nosocomial and/or occur in people with comorbidities, this clinical case serves to alert the scientific community to the possibility of infection by *S. odorifera* in the community and in healthy individuals.

Acknowledgements

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