# COVID-19 infection responsive to convalescent plasma:
## A case report of a patient on rituximab who improved with immunoglobulin

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## LEARNING OBJECTIVES

1. Highlight delayed antiviral humoral response of COVID-19 infection in patients with anti-CD20 immunosuppression.
2. Recognize importance of further research to better understand the passive immunization (such as with convalescent plasma) of patients with severe COVID-19 disease and underlying (acquired or congenital) humoral immunodeficiency.

## CASE BACKGROUND

58-year-old woman with RA on rituximab presented with 4 weeks of fever and progressively worsening dyspnea and cough in the midst of the COVID-19 pandemic.

- Initial SARS-CoV2 testing by nasopharyngeal NAA was negative
- Originally treated with azithromycin given chest radiograph findings concerning for atypical pneumonia *(Figure 1)*
- Symptomatically progressed over the following 10 days and re-presented with repeat SARS-CoV2 testing via nasopharyngeal NAA negative
- Admitted given re-presentation with elevated inflammatory markers including C-reactive protein, D-dimer and ferritin, in addition to lymphopenia and new CT of the chest with IV contrast that demonstrated worsening of previously appreciated multifocal infiltrates *(Figure 2)*

## IMAGING

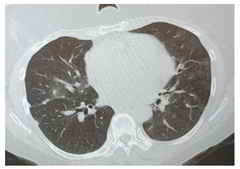


*Figure 1*

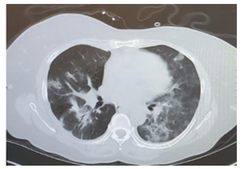


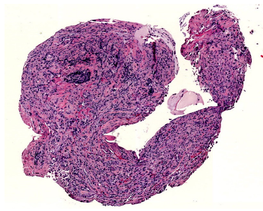
*Figure 2*

## HOSPITAL COURSE

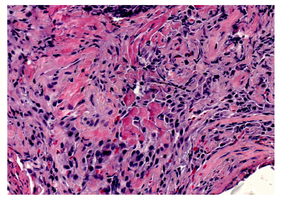
**(in chronological sequence of events)**

- Rapidly increasing oxygen requirements (6L nasal cannula)
- **Bronchoscopy** (hospital day 4):
  - transbronchial biopsy of RLL: *mononuclear inflammatory cell infiltrates and organizing microthrombi (Slide 1 & 2)*
  - bronchoalveolar lavage: *macrophage predominance, negative GMS stain, AFB, fungal and bacterial cultures and stains but* ***positive SARS-CoV2 NAA***
- Serum anti-SARS-CoV2 nucleocapsid IgG immunoassay (Abbott) was NOT detected
- Received convalescent plasma
- 2 days after plasma transfusion her fever defervesced, and she was discharged 6 days post transfusion on 2 liters of nasal oxygen as needed.

## PATHOLOGY SLIDES



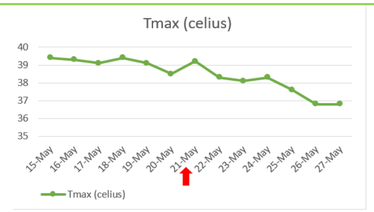
*Slide 1*



*Slide 2*

## DISCUSSION

- Important to consider delayed antiviral humoral response to COVID-19 infection in patients on humoral immunosuppression such as Rituximab when witnessing a delayed clinical respiratory decompensation.
- Opens a realm of possibilities for further research to evaluate passive immunization (such as with convalescent plasma) of patients with severe disease and underlying (acquired or congenital) humoral immunodeficiency.




*Fever curve throughout the admission with arrow representing plasma administration*

## CONCLUSION

- Until more research is conducted on underlying mechanism, those with humoral immunosuppression should be monitored more closely for delayed presentation.
- More research is needed to assess if those with humoral immunosuppression have a more severe COVID-19 disease course.
- There is not enough evidence at this time to recommend halting humoral immunosuppressive therapy with COVID-19 infection given risk of progression of underlying disease.
- Recommend more research in the use of convalescent plasma in humoral immunodeficient individuals.

## ACKNOWLEDGMENT

- LMC Internal Medicine Residency Program
- Delaware Valley ID Associates
- MLH LMC Division of Pathology

## REFERENCES

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