

Abstract

Introduction

A thyroid storm is a severe exacerbation of thyrotoxicosis that can cause significant morbidity and mortality. The coronavirus SARS-CoV-2 which causes COVID-19 infection has spread throughout the world. We report the first documented case of thyroid storm in a pregnant woman with COVID-19.

Case report

A 42-year-old multiparous woman with a gestational age of 35+2 weeks presented to the emergency unit with altered mentation, seizure, and a high fever with a temperature of 38.3°C. Other vital signs showed a heart rate of 115 beats per minute and blood pressure of 121/71mmHg. Fortunately, the fetal heartbeat was 151bpm by Doppler and the fetal movement was good. Laboratory results demonstrated a thyroid-stimulating hormone level of <0.01 mIU/L (3rd trimester-specific reference ranges[3TRR], 0.38-4.04 mIU/L), free thyroxine of 1.95 ng/dL (3TRR, 0.5-0.8 ng/dL), total triiodothyronine of 183.9 ng/dL (3TRR, 123-162 ng/dL). Nasopharyngeal COVID-19 testing was positive. According to Burch and Wartofsky criteria (1993), the score was 55, which highly suggested thyroid storm, though she was first treated with labetalol, magnesium, and midazolam because atypical eclampsia couldn't be excluded. The seizure lasted till the general anesthesia started for the cesarean section however, brain CT and MRI revealed neither brain hemorrhage nor visible causes of the seizure. (Fig.1) She recovered from post-ictal confusion which lasted for more than 1 day after the emergent cesarean section. For further evaluation, EEG(Electroencephalography) was done right after cesarean delivery and on the post-operation day 4, with the consultation to the neurologic department. Both EEGs showed non-specific findings. The postoperative diagnosis was Graves' disease and Methimazole 1T was given to the patient. Her COVID-19 course was uncomplicated, she left the hospital with no respiratory symptoms. (Fig.2)

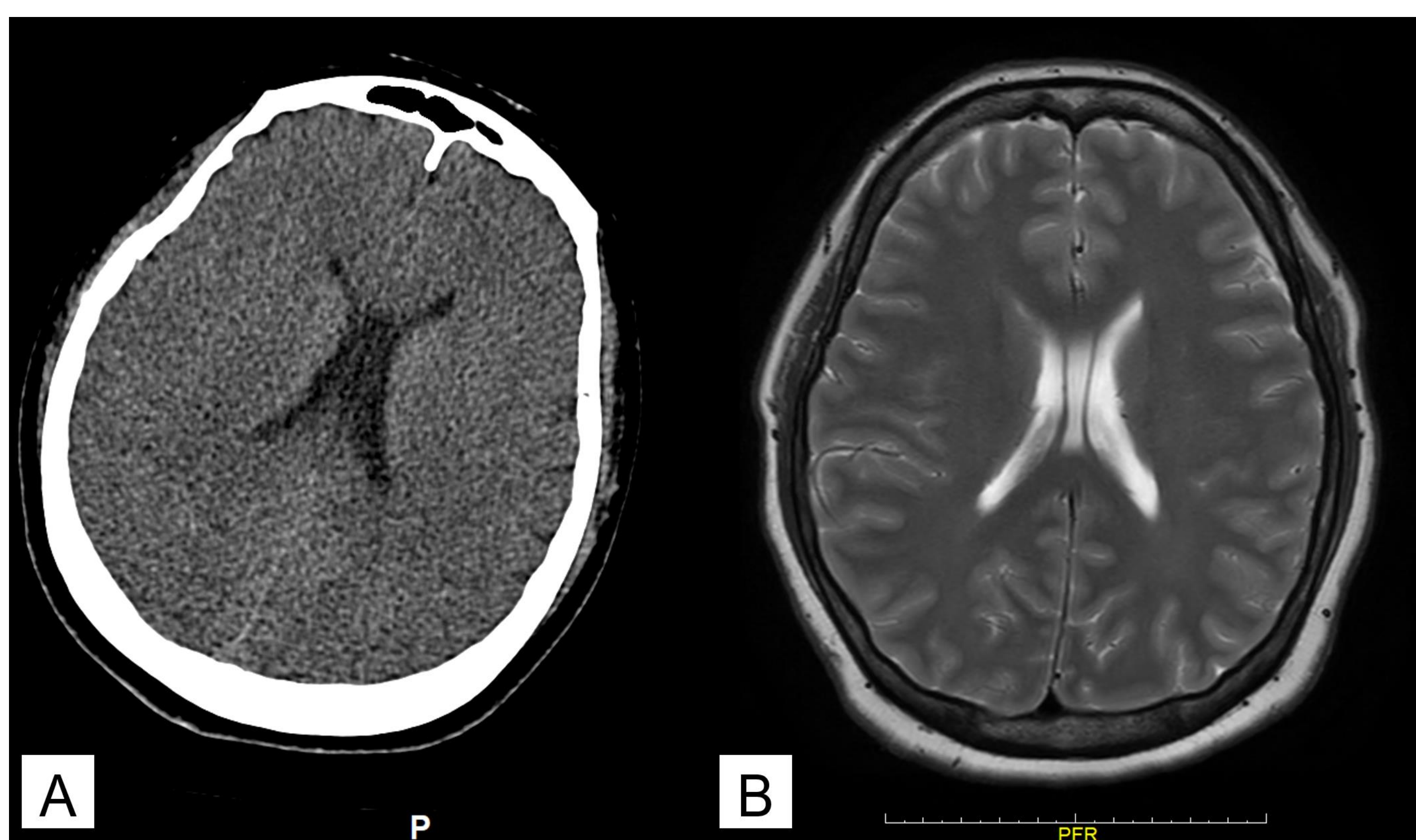


Fig. 1. (A) Preoperative Brain CT scan shows no hemorrhagic lesion or visible causes of the seizure. (B) Preoperative Brain MRI also shows non-specific findings.

Discussion

A thyroid storm is one of the prevalent endocrine emergencies and is often triggered by acute infections. Pregnant women with thyroid toxicosis may have concomitant COVID-19 infection that could affect the clinical course and disease severity. COVID-19 has been associated with thyroid function through Angiotensin-converting enzyme 2 (ACE2), which is interestingly manifested higher in the thyroid than in the lung. (Fig.3) This case highlights the importance of considering the COVID-19 as a potential trigger of a thyroid storm and the need to maintain extreme caution of maternal hyperthyroidism with COVID-19 infection, as it could provoke thyroid storms as occurred in our case.

Conclusion

Clinicians should be aware that thyroid dysfunction in a pregnant woman without a previous endocrine disease could be due to the COVID-19 infection. Early recognition, anti-hyperthyroid therapy, and fetal monitoring are required in emergency conditions. More studies are needed to propose an established treatment guide for thyroid dysfunction with COVID-19 infection in pregnant women.

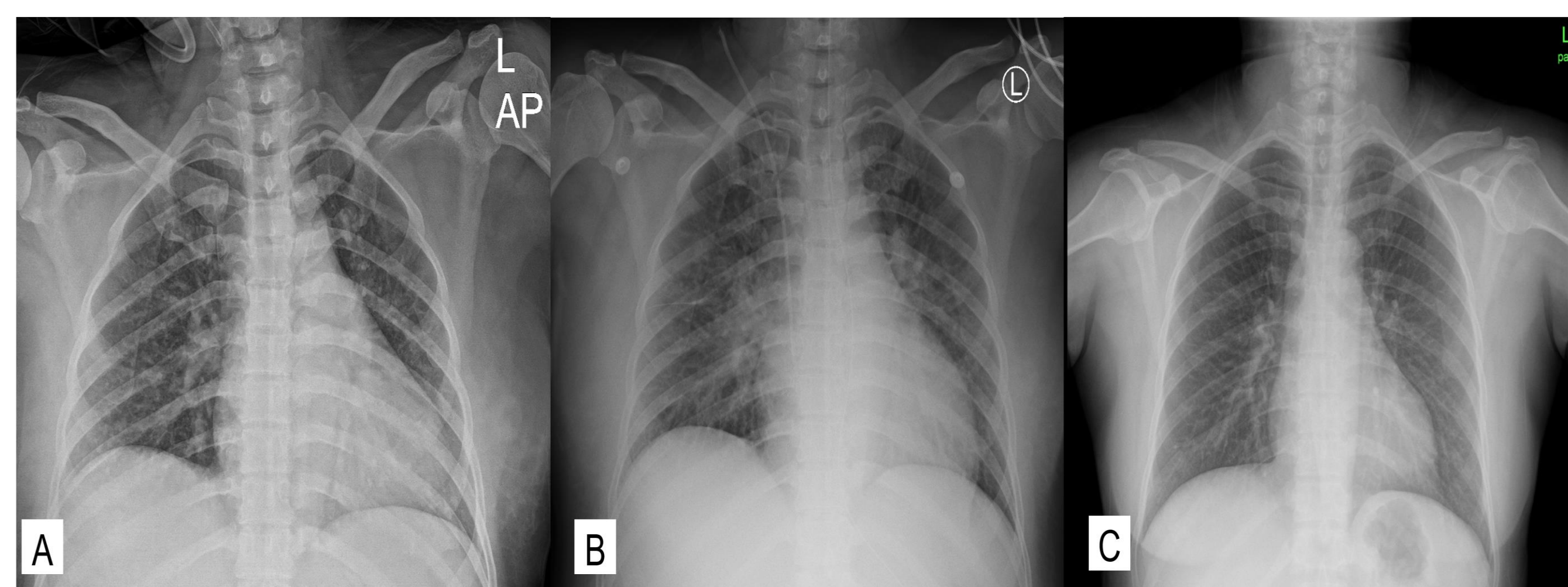
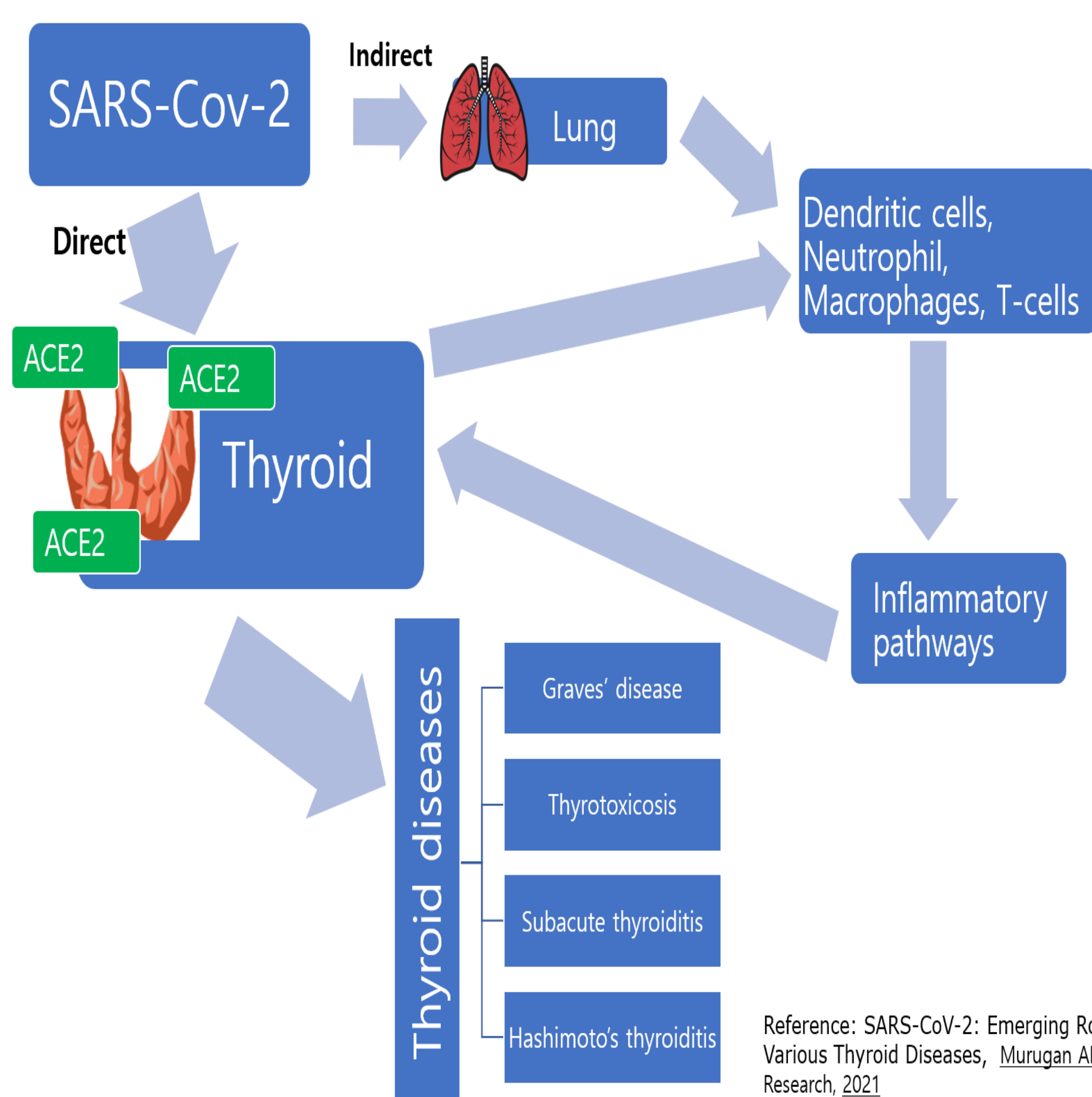


Fig. 2. (A) Preoperative chest AP shows no active lung lesion. (B) Chest X-ray on postoperative day 2 shows aggravated consolidation in both lungs. The patient was treated with an antibiotics regimen based on pneumonia. (C) After 5 days, there was a remarkable improvement in the chest X-ray.



Reference: SARS-CoV-2: Emerging Role in the Pathogenesis of Various Thyroid Diseases, Murugan AK et al, Journal of Inflammation Research, 2021

Fig. 3. The SARS-Cov-2 virus hijacks human angiotensin-converting enzyme 2 (ACE2) in the thyroid and in the lung. ACE2 demonstrates as a viral entry-receptor. Then, inflammatory pathways provoke thyroid diseases such as Graves' disease and thyrotoxicosis as in our case.