CASE REPORT

POST COVID EXTENSIVE VENOUS THROMBOSIS IN A PATIENT HAVING INFRAHEPATIC INTERRUPTION OF THE INFERIOR VENA CAVA (IVC) WITH AZYGOS CONTINUATION

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ABSTRACT

The failure of the hepatic and prerenal segments of the inferior vena cava (IVC) to merge during embryological development, leading to the persistence of either the azygous or hemiazygous vein, results in the rare condition "infrahepatic interruption of the IVC with azygos continuation" (0.6% prevalence). This anomaly is predisposed to IVC thrombosis due to restricted blood flow, resulting in venous hypertension, stasis, and thrombosis. Notably, hypercoagulability is a concern in COVID-19 patients. Here, we present a case of extensive post-COVID venous thrombosis in a 25-year-old male with infrahepatic interruption of the IVC and azygos continuation, following COVID-19 infection. The patient reported back pain and abdominal discomfort, with an MRI of the lumbar spine revealing extensive venous thrombosis in the IVC and iliofemoral veins, along with multiple venous collaterals. Subsequent contrast-enhanced CT imaging confirmed severe IVC stenosis or interruption, iliofemoral venous thrombosis, and azygous and hemiazygous connections. Radiologists must maintain a comprehensive understanding of the diverse congenital IVC anomalies to prevent diagnostic inaccuracies, and this knowledge proves equally crucial for surgeons and cardiologists in the context of preoperative planning.

Keywords: Inferior venacava anomalies, azygos vein continuation, COVID-19 complications.

Introduction

Failure of the union between the hepatic and prerenal segments of IVC during embryological development with persistence of either azygous vein or hemiazygous vein restoring venous return results in the infrahepatic interruption of the inferior vena cava (IVC) with azygos continuation.[1] It has a prevalence of 0.6%.[2] This anomaly is predisposed to inferior vena cava (IVC) thrombosis through the constriction of venous return pathways to the heart. Despite the development of conspicuous collateral vessels, it results in venous hypertension, stasis, and eventual venous thrombosis.[3] Hypercoagulability has emerged as a notable complication in individuals afflicted by COVID-19 and those convalescing from the disease.[4]

Case Presentation

A 25-year-old male, devoid of known comorbidities, was in his typical state of well-being when he manifested low-grade fever. Subsequent diagnosis revealed the presence of COVID-19 pneumonia,

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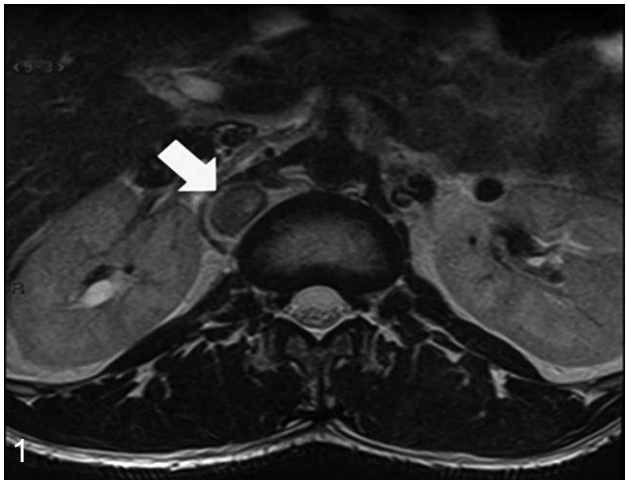
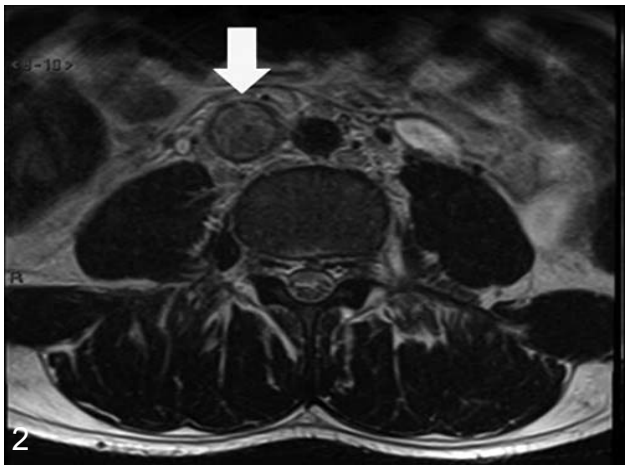
confirmed through a positive Polymerase Chain Reaction (PCR) test. Remarkably, he exhibited no concurrent hypoxia or any other discernible respiratory symptoms. A follow-up PCR conducted 10 days later yielded a negative result, indicating viral clearance. Following this period of apparent recovery, the patient's health took a significant downturn approximately one week later. He experienced sudden onset of severe back pain, which persisted continuously. Notably, he also complained of generalized abdominal pain. In response to these new symptoms, a therapeutic regimen targeting enteric fever was initiated, and further diagnostic investigations were recommended to elucidate the underlying causes of his distress.

MRI lumbar spine was performed which showed extensive thrombosis of the venous system including IVC, common iliac, external and internal iliac veins with significant strandy changes and edema in the prespinal soft tissues.





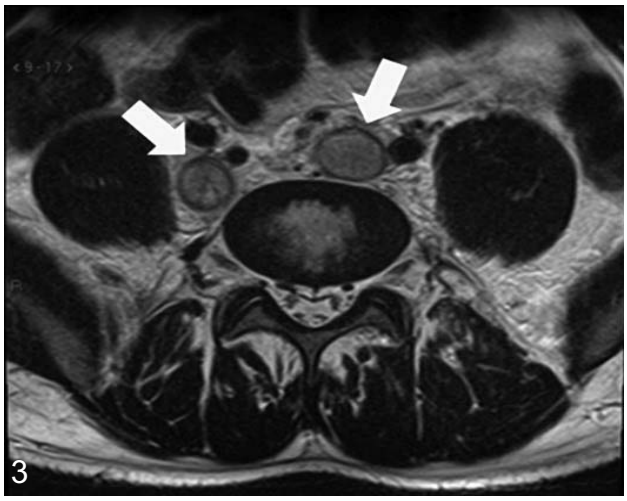
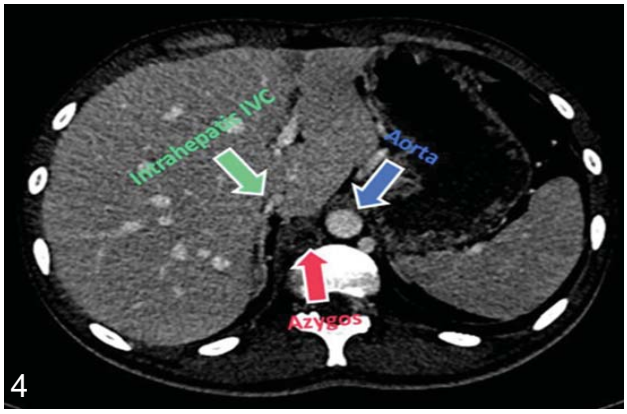


Figure 1,2&3: MRI axial images showingthrombosed azygos and common iliac veins.

CT abdomen and pelvis with contrast was done that confirmed severe stenosis of IVC in its lower most intrahepatic course with multiple tortuous-collaterals, iliofemoral venous thrombosis, azygous and hemiazygous system joining IVC with infrahepatic interruption of IVC and azygous continuation.



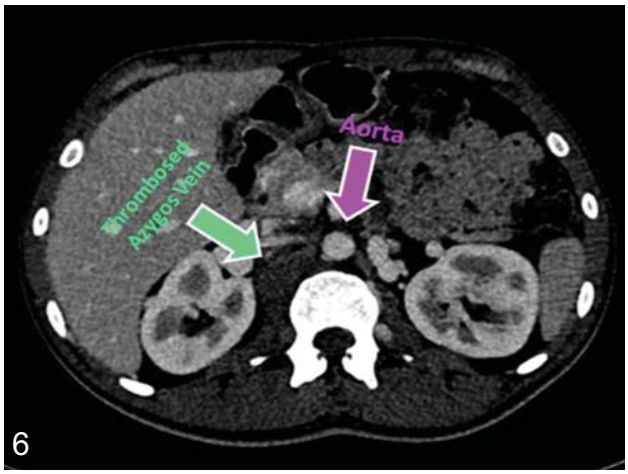


Figure 4,5&6: CT scan with contrast axial images showing severe stenosis of intrahepatic IVC, extensive collaterals and thrombosed azygos vein.

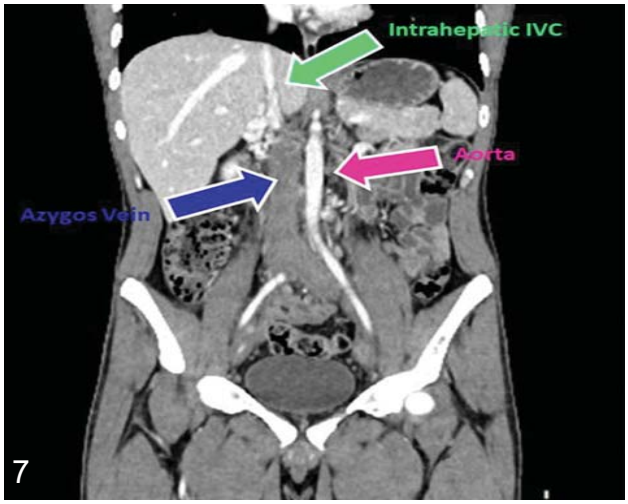


Figure 7&8: CT scan with contrast coronal images showing infrahepatic interruption with azygos continuation.

The patient was treated with anti-coagulants and his symptoms relieved.

Discussion

Severe acute respiratory syndrome coronavirus (SARS-CoV-2) or 2019 novel coronavirus (2019-nCoV) was initially discovered in China, but as it spread over the world, it became a pandemic. Covid-19 infection frequently results in opportunistic infections. Patients who have comorbid conditions are more vulnerable.[5] Each passing wave of Covid raised cases as compared to previous wave because of different variants. The frequency of steroid use rose along with the number of COVID patients. It's possible that steroids were misused outside the rules, leading to further negative effects including deep vein thrombosis.[6] The prevalence of pulmonary thromboembolic disease is 38% in Covid-19 patients. CT angiography is crucial in identifying such situations and eliminating alternative possibilities.[7] It is unusual to observe infrahepatic disruption of the inferior vena cava (IVC) with azygos or hemiazygos continuation. The intrahepatic section of the IVC is absent in this anatomic entity, and the hepatic veins drain straight into the right atrium. The IVC directs venous blood flow from the lower body into the azygos system at the level of the renal veins, resulting in dilatation of the azygos and/or hemiazygos veins. Because these engorged vessels run parallel to the descending thoracic aorta, they might be misinterpreted during transesophageal echocardiography (TEE) as aortic disease (dissection, aneurysm, or rupture).[8] Concurrent covid induced deep vein thrombosis with this anatomical variant is rarely seen. Thus, radiologists should keep this rare anomaly in mind in lessening patients morbidity and mortality.

Conclusion

Proficiency in the recognition of assorted congenital anomalies pertaining to the inferior vena cava (IVC) is indispensable for radiologists to avert diagnostic pitfalls as well as surgeons and cardiologists for meticulous preoperative planning.

Conflict of Interest: All authors declare no conflict of interest.

Ethical Statement: The patient signed an informed consent form, as per the ethical guidelines of hospital board.

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