

Case Report

COVID-19 leading to amputation in an eleven-year-old: A Case Report

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Abstract

COVID-19 is an ongoing pandemic and all age groups are affected by SARS-CoV-2. Past studies showed that children are less affected by it and symptoms are quite variable as compared to adults. Multisystem Inflammatory Syndrome in Children (MIS-C) and Kawasaki-like illness are observed along with COVID-19 associated multi-organ failure, acute respiratory distress syndrome (ARDS), and coagulopathy in the paediatric age group. Thrombotic complications in patients with COVID-19 have variable presentation including venous thromboembolism and ischemic complications related to thrombosis of extremity, cerebral, coronary, and distal arteries. Early recognition of acute limb ischemia and treatment can help to reduce mortality and maximize the chance of limb salvage. Here, we report a case of 11 years old child who developed gangrene of bilateral lower limbs after mild COVID-19 illness that ended in below-knee amputation.

Keywords: COVID-19, pediatric, pandemic, coagulopathy.

Introduction

COVID-19 pandemic continues to be a major threat to the human population worldwide. The causative organism is a novel virus, belongs to the family coronaviridae, and is named after severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).¹ Virus is first found in the city of China in December 2019.² Disease course in children is comparatively milder than seen in adults due to some reasons yet to be determined. A recent study conducted in China to assess the burden of the severity of disease among different age groups in children showed the highest rate in infants (10.6%) followed by the age group from 1-5 years (7.3%).³ According to a study done in France, a significant proportion of previously healthy patients (30%) encountered lethal manifestation of COVID-19.⁴ Here, we present a case of an eleven years old child who presented with limbs discoloration (a rare presentation), which was later diagnosed as dry gangrene post-COVID-19 infection and ultimately led to below-knee amputation.

Case Report

An 11-year-old male child, presented to the Pediatric Emergency Department of Holy Family hospital, Rawalpindi in January 2021, with complaints of bluish discoloration of legs for the last 3 days which was associated with severe pain and inability to walk. The patient further gave a history of fever and sore throat 3 weeks back which got settled after few days without medication. The patient denied any history of hospital admissions in the past. All his family members were alive and healthy. There was no history of traveling for the last 2 weeks. On physical examination, his vitals were; temperature: 99o F, heart rate: 92/min, respiratory rate: 30/min, and blood pressure: 100/70mmHg. Lower limbs examination showed bluish-black discoloration of left lower limb till mid-calf and bluish discoloration of right lower limb till lower calf, and there was a line of demarcation present over the left lower limb. Pulses including dorsalis pedis and posterior tibial arteries were not palpable bilaterally and the rest of the systemic examination including the respiratory system was unremarkable.



Figure 1: Gangrene of lower limbs before below-knee amputation

Laboratory investigations were done and showed leukocytosis: 29.2×10^9 (normal reference range: $4.0-10.0 \times 10^9$) with neutrophilia: 91.9% (normal reference range: 40-80) and lymphopenia: 4.8% (20-40), CRP was 68 (0-6) and ESR was also high, 80 (0-15mm/hour). Coagulation screening showed PT 15secs (10-16), aPTT 38secs (24-39) and D-Dimers 0.8mg/L (normal below 0.5). Chest X-ray was normal and ECG showed a normal sinus pattern. Arterial doppler revealed absent flow in distal, anterior tibial, posterior tibial, and dorsalis pedis arteries. Venous doppler showed no evidence of deep vein thrombosis. The patient was managed empirically with broad-spectrum antibiotics, low molecular weight heparin, and pain killers. Echocardiography was unremarkable with no evidence of intracardiac thrombus. The thrombophilic screening was advised keeping in view congenital thrombophilia which showed antithrombin III 98% (85-122), protein C 81% (72-160), and protein S 74% (60-150). Serum ANA levels of 0.43 (normally less than 0.83) broadly excluded autoimmune vasculitis in this patient. RT-PCR for SARS-CoV2 was sent keeping in view variable presentation of COVID-19, but it turned out to be negative so COVID-19 serology was performed and Immunoglobulin G levels were positive: 3.91 (negative <1.0). CT Angiography further confirmed almost complete stenosis of bilateral anterior tibial and posterior tibial arteries with collateral vessel formation.

Despite management with anticoagulants and steroids, the patient developed gangrene of both limbs, and a line of demarcation of the right leg also appeared on day-5 of admission. Surgical consultation was done and the fate of the patient was decided in terms of below-knee amputation. The patient was discharged

on warfarin after bridging with heparin. The patient was monitored serially with INR and one month after discharge, no further evidence of thrombotic event was found.

Discussion

COVID-19 infection is less prevalent in children but this age group is equally susceptible to this infection.⁵ According to Chinese data, Pediatric COVID-19 cases are less severe as compare to adults but children have presented with variable symptoms than do adults.⁶ Common signs and symptoms in children vary from myalgia, sore throat, fever, runny nose, headache, tachypnea, to gastrointestinal complaints of diarrhea and vomiting. Other manifestations include coagulopathy, shock, renal failure, and cardiac dysfunction. Multisystem Inflammatory Syndrome in Children (MIS-C), a term recently introduced in pediatric age group in which patient presents with mild inflammation to multi-organ failure and shock.⁷

Being a hypercoagulable state, it can present with variable manifestations including peripheral arterial infarcts to pulmonary thromboembolism despite adequate anticoagulation.⁸ The underlying pathology behind this state is quite complex as viruses can initiate coagulation cascade and trigger cytokines production by activation of monocytes and macrophages. These phenomena are being called immuno-thrombosis. The disruption in normal antithrombotic property of endothelial cells and activation of the complement cascade can lead to possible complications associated with COVID-19.⁹

A case study from Iraq highlighted this complication in an adult patient with no comorbidities.¹⁰ Iran-based studies proposed antithrombotic prophylaxis in children with COVID-19 which states that patients with mild COVID-19 should be kept under monitoring with coagulation markers keeping in view that some adult patients with mild symptoms had a worsening disease course afterward.⁹ Our case is unusual in terms of its presentation and disease course as mild COVID-19 cases are seldom seen with complications. Our patient also presented late as gangrene of one limb was already established at the time of presentation and eventually, amputation had to be done. To our knowledge, no case has been reported from the paediatric age group being affected by COVID-19 associated coagulopathy from Pakistan. A case report has been written after taking consent from the patient's family.

Conclusion

Though the spectrum of COVID-19 is different in children, its associated complications are as lethal as seen in adults. Our patient developed gangrene due to arterial thrombosis after mild infection, so mild COVID-19 cases can present later with serious complications. Effective monitoring and timely intervention of patients with COVID-19 associated coagulopathy is the key to improve the outcome. Health professionals should also have a high suspicion of COVID-19 in such a case, particularly during this global pandemic.

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