Case Report

Ischemic Priapism Progressing to Penile Gangrene in a Patient with COVID-19 Infection: A Case Report with Literature Review

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Priapism is considered a rare disorder and even more rare when it occurs as a complication of COVID-19. To the best of our knowledge, only eight studies have reported priapism as a complication of COVID-19 [6–13]. Here, we report a case of a 66-year-old male with COVID-19 who presented with neglected priapism for three days.

1.Introduction

A novel coronavirus (CoV) emerged in Wuhan, China, at the beginning of December 2019, named “COVID-19” by the World Health Organization (WHO) [1]. It causes a range of respiratory and gastrointestinal symptoms, including fatigue, cough, and fever that may progress to severe respiratory failure [2]. Other life-threatening complications include venous and arterial thromboembolism [3]. Pulmonary embolism (PE) is recognized as the most common thrombotic manifestation, while arterial events have been reported less frequently [4]. Priapism is considered a rare disorder [5] and even more rare when it occurs as a complication of COVID-19. To the best of our knowledge, only eight studies have reported priapism as a complication of COVID-19 [6–13].

Here, we report a case of a 66-year-old male with COVID-19 who presented with neglected priapism for three days and penile gangrene.

2. Case Presentation

A 66-year-old male patient presented to the emergency room (ER) with shortness of breath, cough, and generalized fatigue for two days; he tested positive for COVID-19 infection. However, he had a stable O2 saturation and was discharged accordingly. Five days following discharge, the patient represented to the ER with shortness of breath and neglected priapism of three days duration.

On his second ER visit, his O2 sat was 78% on room air, 92-93% on 15 L/min nonrebreather mask, blood pressure was 126/81 mmHg, respiratory rate was 21/min, pulse rate
was 110 beats per minute, and body temperature was 36.9°C. His Glasgow Coma Scale (GCS) score was 15 out of 15.

On examination, the patient was conscious and distressed. A priapism was observed together with blackened areas on the glans penis extending to the midpenile shaft denoting penile gangrene. A clear line of demarcation was noticed at the midpenile shaft.

The patient’s medical history included type 2 diabetes mellitus (DM), hypertension (HTN), ischemic cardiomyopathy, and chronic kidney disease (CKD): stage 3b with baseline creatinine 1.5–1.6 mg/dL, atrial fibrillation, an old cerebrovascular accident (CVA) with no residual weakness apart from baseline expressive aphasia, and depression.

The patient’s medications included amlodipine, insulin NovoMix, and hydralazine. He had also been taking warfarin 7.5 mg once daily and risperidone 0.25 mg and mirtazapine 30 mg once daily as needed for the past five years.

Laboratory findings at admission showed leukocytes of 10.70 × 10^9/L (4.00–11.00), hemoglobin 11.1 g/dL (13.5–17.2), platelet count 220 × 10^9/L (150–450), prothrombin time (PT) 90 sec (11.0–15.0), international normalized ratio (INR) 7.19 (0.89–1.10), C-reactive protein (CRP) 219.50 mg/L (0.00–5.00), creatinine 244.20 μmol/L (60.00–115.00), urea in serum 23.50 mmol/L (3.00–9.20), D-dimer 20.0 mg/L (0.0–0.5), and a positive COVID-19 polymerase chain reaction (PCR) test.

Penile duplex was performed and showed no blood flow in both cavernosal arteries. Magnetic resonance imaging (MRI) for the penis was requested to evaluate for necrosis but was unavailable in the hospital, and the patient could not be transferred due to his desaturation status.

2.1. Therapeutic Intervention. On admission, warfarin was withheld, and vitamin K 10 mg IV was administered together with four units of fresh frozen plasma (FFP) to correct his elevated INR. He also received dexamethasone 6 mg IV and ceftriaxone 2 gm IV infusions. The patient was then admitted under the intensive care unit/internal medicine (ICU/IM) for further management of his COVID-19 infection and warfarin toxicity.

A suprapubic tube was placed to relieve urinary retention by the urology team, who further recommended penile aspiration/surgical intervention after INR correction. Later, in the same day, the patient developed hypoxia and was connected to high flow nasal canula (HFNC): FLOW 60, FIO2 100%, and stabilized. His INR had reduced from 7.14 to 1.70, and anesthesia consultation was done for surgical approval.

The patient was taken to the operating theatre (OR), and as he was very agitated and a trial of a local penile block was not feasible, general anesthesia was introduced. Penile aspiration was performed, and the cavernosal blood sample showed evidence of ischemic priapism. However, penile aspiration was not successful to alleviate his erection. Given the intraoperative findings and the patients’ poor general condition, it was decided to perform a partial penectomy.

Postoperatively, he was kept intubated and mechanically ventilated for three days, at which point he was successfully extubated. Eventually, he was discharged home with O_2 maintained on room air.

3. Discussion

Priapism is a penile erection that lasts four hours or longer and is unrelated to sexual stimulation [14]. Priapism is grouped into three types: ischemic type (which requires immediate clinical intervention), nonischemic type, and stuttering (recurrent) priapism. Ischemic priapism (also known as venoocclusive priapism) is characterized by a painful penile erection which persists for a prolonged time leading to little or no blood flow to the corporal bodies [15]. Priapism can result from conditions associated with increased blood viscosity such as sickle cell disease and hematological malignancies [16], and hyperviscosity in patients with COVID-19 has been previously reported in the literature [17, 18], possibly accounting for the development of priapism in COVID-19 patients.

Moreover, COVID-19 is known to cause hypercoagulability although the underlying mechanisms for this are not well understood. Hypotheses include cytokine storm, complement activation, shutdown of fibrinolysis, and COVID-19 itself activating the coagulation cascade. Excessive release of cytokines causes thrombosis through a variety of processes, including the activation of monocytes, neutrophils, and the endothelium. All of these mechanisms can contribute to the prothrombic state [4, 19]. It has been documented that COVID-19 patients can develop thrombotic events even when they are anticoagulated. Therefore, screening for thromboembolic events is essential in such patients [20]. In our literature review, we found eight cases of ischemic priapism, including one case of stuttering ischemia associated with COVID-19 infection (Table 1). Reported cases included patients ranging in age from 34 to 69 years, of whom one was also undergoing warfarin therapy, as in the current case. By comparison to our case, however, priapism did not progress to gangrene in any of the previously reported cases nor did any patient require surgery. No known risk factor for priapism was reported in four cases, and detumescence was achieved with an intracavernosal injection in five of the eight cases.

In our presented case, there were many risk factors for developing priapism other than COVID-19 infection, including unopposed warfarin action and antidepressant medication. However, it is only COVID-19 that had a recent onset in our patient compared to his long-term use of antidepressants and warfarin. Regardless of the cause, however, priapism rarely progresses to penile gangrene [21]. Other studies have also suggested that priapism was most likely induced by COVID-19 infection rather than other factors [6–8]. All of these evidences strongly suggest the need for the diagnosis and prevention of thrombotic diseases in at-risk patients with COVID-19 infection.
<table>
<thead>
<tr>
<th>Study</th>
<th>Age (y)</th>
<th>Type of priapism</th>
<th>Duration of priapism</th>
<th>ICU admission</th>
<th>Drug history</th>
<th>Medical history/comorbidities</th>
<th>Treatment of priapism</th>
<th>Follow-up/outcome</th>
<th>Purported priapism risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lam et al., 2020 [6]</td>
<td>67</td>
<td>Ischemic</td>
<td>Unknown duration</td>
<td>N/A</td>
<td>Warfarin</td>
<td>Dilated cardiomyopathy of unknown etiology, left bundle branch block, cutaneous scleroderma, paroxysmal atrial fibrillation, DM type 2, and iron deficiency anemia</td>
<td>Conservative</td>
<td>Died due to clinical deterioration</td>
<td>Warfarin Minor trauma</td>
</tr>
<tr>
<td>Silverman et al., 2021 [7]</td>
<td>69</td>
<td>Ischemic</td>
<td>Unknown duration (&gt;3 hours)</td>
<td>Yes</td>
<td>N/A</td>
<td>Obesity</td>
<td>Intracavernosal phenylephrine injection</td>
<td>Achieved detumescence, but eventually died due to clinical deterioration</td>
<td>Propofol</td>
</tr>
<tr>
<td>Lamamri et al., 2021 [8]</td>
<td>62</td>
<td>Ischemic</td>
<td>Unknown duration (&gt;4 hours)</td>
<td>Yes</td>
<td>None</td>
<td>Left inguinal surgery and appendectomy</td>
<td>Intracavernosal ethylephrine injection</td>
<td>Achieved detumescence and was discharged to ward</td>
<td>None</td>
</tr>
<tr>
<td>Addar et al., 2021 [9]</td>
<td>62</td>
<td>Ischemic</td>
<td>10 days</td>
<td>Yes</td>
<td>N/A</td>
<td>HTN and dyslipidemia</td>
<td>Intracavernosal phenylephrine injection</td>
<td>Achieved detumescence and was discharged home</td>
<td>None</td>
</tr>
<tr>
<td>Carreño et al., 2021 [10]</td>
<td>39</td>
<td>Ischemic</td>
<td>3 days</td>
<td>Yes</td>
<td>None</td>
<td>Overweight</td>
<td>Intracavernosal adrenaline injection</td>
<td>Failed to achieve detumescence and eventually died due to clinical deterioration</td>
<td>Propofol</td>
</tr>
<tr>
<td>Grimberg et al., 2021 [11]</td>
<td>45</td>
<td>Stuttering ischemic priapism</td>
<td>Unknown duration (&gt;4 hours)</td>
<td>N/A</td>
<td>N/A</td>
<td>HTN and benign prostatic hyperplasia</td>
<td>Intracavernosal phenylephrine injection</td>
<td>Achieved detumescence and was discharged home</td>
<td>None</td>
</tr>
<tr>
<td>Larrarte-arenas et al., 2021 [12]</td>
<td>65</td>
<td>Ischemic</td>
<td>30 hours</td>
<td>No</td>
<td></td>
<td>Nifedipine, prazosin, calcitriol, subcutaneous erythropoietin, and unfractionated heparin</td>
<td>Intracavernosal epinephrine injection</td>
<td>Achieved detumescence</td>
<td>Renal replacement therapy</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Chronic kidney disease on hemodialysis, HTN, secondary hyperparathyroidism, and anemia</td>
<td></td>
<td></td>
<td>Prazosin</td>
</tr>
<tr>
<td>Study</td>
<td>Age (y)</td>
<td>Type of priapism</td>
<td>Duration of priapism</td>
<td>ICU admission</td>
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<tr>
<td>Giuliano et al., 2021</td>
<td>34</td>
<td>Ischemic</td>
<td>36 hours</td>
<td>No</td>
<td>None</td>
<td>None</td>
<td>Initially, intracavernosal phenylephrine injection (failed to achieve detumescence). Then, a bilateral T-shunt procedure was performed.</td>
<td>The bilateral T-shunt helped to achieve detumescence, and the patient was discharged home. However, it was complicated by complete erectile dysfunction after 3 months of follow-up</td>
<td>None</td>
</tr>
<tr>
<td>Our case</td>
<td>66</td>
<td>Ischemic</td>
<td>progressed to penile gangrene</td>
<td>3 days</td>
<td>Yes</td>
<td>Amlodipine, insulin NovoMix, hydralazine, warfarin, risperidone, and mirtazapine</td>
<td>DM type 2, HTN, ischemic cardiomyopathy, chronic kidney disease, atrial fibrillation, cerebrovascular accident, and depression</td>
<td>Partial penectomy</td>
<td>The patient improved and eventually was discharged home</td>
</tr>
</tbody>
</table>

| Table 1: Continued. |
Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Consent

All patient’s identifying information is hidden and undisclosed. Consent was obtained from the patient for publication.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References