Wunderlich syndrome in a COVID-19 patient with poor outcome

Moniaga Prawira, Sawkar Vijay Pramod, Zola Wijayanti

Department of Urology, Padjadjaran University, Hasan Sadikin Hospital, Bandung, 40161, Indonesia

A R T I C L E   I N F O

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A B S T R A C T

A 42-years-old female presented with loss of consciousness and gross hematuria. Physical and laboratory examination indicated hemorrhagic shock. CT-Scan showed massive retroperitoneal hemorrhage on left kidney. The patient needed selective arterial embolization, but the facility was not available for COVID-19 patients who require negative pressure room. The patient underwent renal exploratory laparotomy and right nephrectomy, but did not survive due to multiple organ dysfunction syndromes.

Wunderlich syndrome is a severe hemorrhagic complication in COVID-19. The three symptoms are known as Lenk’s triad which includes hypovolemic shock, flank mass, and acute flank pain. In this report, we presented a patient with Wunderlich syndrome in COVID-19.

1. Introduction

COVID-19 infection is often related to thromboembolic events and hemorrhage. Hematologic complications, including thrombosis, hemorrhage, and vasculitis, can be caused by elevated C-reactive protein and inflammatory cytokines. Wunderlich syndrome is a severe hemorrhagic complication in COVID-19 that indicates spontaneous renal hemorrhage, but is only restricted to the subcapsular and/or perirenal spaces. There are 3 symptoms known as the Lenk’s triad, which include hypovolemic shock, flank mass, and acute flank pain. In this report, we presented a patient with Wunderlich syndrome in COVID-19.

2. Case presentation

A 42-years-old female presented with decrease of consciousness and gross hematuria one week prior to admission. The patient complained of intermittent right flank pain accompanied by palpated right abdominal mass. The patient was in hypovolemic shock and diagnosed with COVID-19 infection. Fluid resuscitation and blood transfusion with packed-red cell transfusion were carried out.

The patient was subsequently referred to our hospital. She had history of hemodialysis one week prior to admission (due to AKI condition), and there was no history of previous urological surgery. The previous daily urine production was 300 cc/24 hours. Physical examination showed blood pressure of 150/105 mmHg, heart rate 144/min, respiratory rate 30/min with non-rebreathing mask 15 lpm, O2 saturation 98%, and temperature 36.5°C. The abdomen was distended, and muscle rigidity was present. The bowel sound was decreased. Costovertebral angle tenderness was positive on right flank. Urinary catheter was inserted with reddish urine production.

On laboratory examination, the patient was in moderate anemia with hemoglobin and hematocrit value of 7.5 g/dl and 21.9%, respectively. Urea and creatinine levels were increased to 144 mg/dl and 6.2 mg/dl respectively, indicating acute kidney injury (AKI). Gross hematuria was shown in urinalysis with more than 50 erythrocytes per high power field. Coagulopathy was present, which was characterized by thrombocytopenia, prolonged PT of 15 seconds, aPTT of 26.6 seconds, and INR value by 1.25. Abdominal CT-scan showed enlarged right kidney with fat dense lesion with size of 6.65 x 8.81 x 14.63 cm, accompanied by massive retroperitoneal hematoma. Chest x-ray showed infiltrates at the bottom of the left lung field, indicating sign of typical pneumonia in COVID-19 (Fig. 1).

The patient was planned for selective arterial embolization, but the facility was not available for COVID-19 patients who require negative pressure room. Right kidney exploration by laparotomy and right nephrectomy was performed. We found peritoneal fluid mixed with blood and clot ±3000 ccs; the right kidney sized 3 times larger than the left one (Fig. 2). Pathology examination showed non-specific inflammation on the right kidney, and no malignant tumor cells were found (Fig. 3).

After the surgery, the patient was admitted into the intensive room. The patient’s condition continued to deteriorate. Liver and kidney functions were declining, and severe coagulopathy was also present, accompanied by desaturation of oxygen level. The patient was then deceased due to multiple organ dysfunction syndrome (MODS) on the fifth day after surgery.

* Corresponding author. Department of Urology, Faculty of Medicine, Universitas Padjadjaran, Bandung, West Java, Indonesia.
E-mail address: doktervij@yahoo.co.id (S.V. Pramod).

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3. Discussion

The most frequent symptom out of the Lenk’s triad is acute flank pain. Furthermore, gross hematuria and malaise have been reported in some cases.¹ Initially, the management of hemorrhage includes corrected coagulation parameter, fluid resuscitation, blood transfusion, stopping the use of any anticoagulant agents, and supportive measures. Patients who are unstable hemodynamically should be managed with percutaneous transcatheter arterial embolization (PTAE), a faster therapeutic effect than surgical treatment.²

According to Tang et al., 183 consecutive patients with Covid-19 pneumonia had impaired coagulation parameters and a poor outcome.
Those who succumbed to their disease exhibited greater D-dimer levels, fibrinogen degradation products (FDP), longer PT and APTT values, and were less healthy overall. Early on following hospitalization, abnormal coagulation parameters were noticeable, and in certain patients, fibrinogen concentrations and antithrombin activity gradually declined.\(^3\)

In trauma settings, an increased risk of death (2-folds) has been associated with nephrectomy. Patients with high-grade renal trauma who underwent nephrectomy have been reported to have an 82% increased risk of death.\(^4\) In the non-trauma settings, extremely high mortality rate has been reported to be related to advanced-stage AKI in patients with COVID-19. The mortality is higher (38.9%) in patients with AKI.

The decreased renal reserve and higher risk of AKI may lead to an increased mortality rate in patients undergoing nephrectomy. AKI can be prevented and managed with early fluid resuscitation in hypovolemic conditions or fluid resuscitation along with vasopressor in patients with septic shock. Treatments of AKI in COVID-19 should include hemodynamic stabilization, blood-glucose management, standard care in cases of multi-organ failure, and also avoiding nephrotoxic medications or unnecessary radiocontrast examinations.\(^5\)

In our case, we initially opted for selective arterial embolization, but the facility was not available for COVID-19 patients who require negative pressure room. Therefore, nephrectomy was done as last resort, but the outcome was poor. The poor outcome may be due to worsening condition (AKI, coagulopathy) caused by COVID-19. Embolization may be more beneficial; however, the intervention was not feasible.

4. Conclusion

Wunderlich syndrome is a severe complication in COVID-19. All biochemical parameters, close observation of hemogram, and clotting time should be followed. Successful treatment requires early diagnosis and available interventional radiology. Nephrectomy is the last option because it can increase the risk of death.

**Declaration of competing interest**

The authors declare no conflict of interest.

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