http://jpp.mums.ac.ir
Case Report (Pages: 19635-19640)

Septic Embolism Caused by Chickenpox: Report of A Rare Case

Majid Sezavar [1], Shahabaddin Sorouri [2], Gholamreza Khademi [3], Yasaman Fatemeh Khazaee [4], * Maryam Naseri [1]

[1] Department of Pediatrics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

[2] Lung Diseases Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.

[3] Clinical Research Development Unit of Akbar Hospital, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

[4] Department of Pediatrics, Faculty of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran.

Abstract

Background: Varicella is a common disease in children but can lead to severe complications. This study aimed to investigate the characteristics of a child hospitalized with chickenpox who exhibited thrombosis symptoms requiring intensive care.

Case Presentation: A 33-month-old Iranian girl with chickenpox had the onset of papulovesicular rash and fever three days before being admitted to the hospital. She had extensive ecchymotic lesions on her left leg, which worsened within a few hours and spread to her knee. Peripheral artery thrombosis and pneumonia caused by the varicella virus are rare complications of chickenpox in children.

Conclusion: Although chickenpox is a common infectious disease in children, it can sometimes lead to potentially serious complications such as arterial thrombosis. Patients must be protected from these risks through early diagnosis and optimal treatment management.

Key Words: Chickenpox, Varicella zoster, Thrombosis, Pediatrics.

* Please cite this article as: Sezavar M, Sorouri S, Khademi G, Khazaee Y.F, Naseri M. Septic Embolism Caused by Chickenpox: Report of A Rare Case. J Ped Perspect 2025; 13 (8):19635-19640. **DOI: 10.22038/jpp.2025.88718.5563**

Corresponding Author:

Maryam Naseri, Pediatric Intensive Care Fellowship, Akbar Hospital, Mashhad, Iran. Email: Maryamnaseri63@yahoo.com

1- INTRODUCTION

Chickenpox is a common benign viral disease in childhood caused by varicella zoster and is characterized by vesiculobullous lesions. Infants and the elderly are vulnerable age groups and complications of this disease can be severe, with high death rate in children with immunodeficiency (1, 2).

The incidence of varicella varies from 13 to 16 cases per 1000 people per year. In temperate climates, the annual incidence of varicella is highest in preschool and early elementary school-aged children with an incidence rate greater than 100 per 1,000 children. As a result, more than 90% of people are infected before adolescence (3, 4).

The usual incubation period of chickenpox is 14-16 days. Common symptoms of the disease include fever, a general body rash, itching, fatigue, headache, and body aches (5). The most common complications are secondary bacterial skin infections ranging from superficial impetigo to subcutaneous abscesses. Other relatively common complications include cerebellar ataxia, encephalitis, hepatitis, pneumonia, and thrombocytopenia. Complications such as septic arthritis and osteomyelitis are rarely seen.

This case report aims to describe a case of varicella complicated by thrombosis, pneumonia, and septic shock to raise awareness about a rare complication of this widespread disease in the pediatric age group.

2- CASE PRESENTATION

A 33-month-old Iranian girl with chickenpox had on onset of papulovesicular rash and fever three days before being taken to the hospital. She also had extensive ecchymotic lesions on her left leg, which progressed rapidly within a few hours before her hospital visit and spread to her knee. She was admitted to Akbar Children's Hospital in Mashhad, Iran. The patient was the second child in the family and had a history of being hospitalized as a newborn for jaundice and receiving phototherapy. She had normal growth and development, weighing 13 kg. The other child in the family had skin lesions 20 days prior and had since recovered. The distal pulse of the left leg was not palpable.

Upon arrival, the patient was lethargic. Her temperature was 37.8°C, heart rate 140/min, respiratory rate 30/min, blood pressure 80/60 mmHg, and SpO2 98%. The distal pulse of the left leg was not palpable, and the pulses in the other limbs were palpable but weak.

After admission, the patient was treated with Vancomycin 20 mg/kg every 8 hours, Cefazolin 25 mg/kg every 6 hours, and Amikacin 10 mg/kg every 12 hours. A Heparin drip infusion of 20 units/kg/hour was also started. The patient received a vascular surgery consultation and a Computed Tomography (CT) scan angiography was requested, but it was not possible due to a low glomerular filtration rate (GFR).

According to the infectious disease consultation, the patient was started on methylprednisolone at a dose of 2 mg/kg every 12 hours and meropenem at a dose of 40 mg/kg every 8 hours. The treatment with amikacin was discontinued. Initially, the patient had low blood pressure, so a dopamine infusion at a rate of 7.5 mcg/kg/min was initiated. Due to the lack of response, norepinephrine infusion at a rate of 0.05-0.3 mcg/kg/min was added. Intravenous immunoglobulin (IVIg) was started at 1 g/kg/day for two days.

With the diagnosis of septic shock with oliguria and increased creatinine during hospitalization, the patient was put on a dialysis plan with Continuous Renal Replacement Therapy (CRRT). A Shaldon

catheter was implanted and the patient underwent CRRT two times.

Thrombosis was seen in the tibialis, posterior and dorsalis pedis arteries in the color Doppler ultrasound of the abdominal vessels and lower limbs on the left side. These vessels did not have normal vascular flow.

Thrombosis was not seen in the common iliac artery on either side, the external iliac artery, or the left femoral and popliteal arteries.

Severe edema was seen in the subcutaneous soft tissue of the left lower limb. The image of internal echogenic thrombosis with dilatation in the left femoral and popliteal veins.

The high resolution lung CT scan, diffuse ground glass opacities with consolidation were seen in the basal areas of both sides along with moderate pleural effusion on both sides, preferably on the right side.

The patient underwent orthopedic consultation and it was mentioned that due to the patient's renal and clinical condition, surgery was associated with a high risk of mortality and the patient would not benefit from procedures such as fasciotomy or amputation.

Table-1. Laboratory tests of the patient during eight days of hospitalization.

Ferritin (ng/ml)	Troponin I (pg/ml)	CKMB (ng/ml)	D-dimer (ng/ml)	Coombs (direct)	RF	Retic (%)	PCR (SARS coronavirus)
>2000	42.5	>80	>9600	Negative	Negative	0.5	Negative

Table-2. Laboratory tests of the patient during eight days of hospitalization.

Tests during hospitalization									
WBC (103)	4.4	5.3	6.4	7.4	40.3	44.9	36.7	31	26.6
PMN (%)	25	20	20	13	80	15.7	86	72	78
Lym (%)	67	75	80	86	16	73	12	10	13
Hgb (gr/dl)	7.8	6.6	8.9	12.6	15.6	20	13.8	11.8	10.4
PLT (103)	70	43	36	16	200	101	67	52	139
Urea (mg/dl)	129	139	116	72	74	109	-	-	-
Cr (mg/dl)	1.9	2.06	1.8	1.1	1.4	2	-	-	-
ALP (U/L)	359	-	-	-	-	-	-	-	-
Ca (mg/dl)	5.1	6	5.2	4.3	5.1	6.2	6.5	7.3	10
P (mg/dl)	8.7	8.2	6.9	4.6	4	3.4	4.5	3.6	
Mg (mg/dl)	2.1	1.8	3	1.9	1.2	-	-	-	-
Albumin (g/dl)	3	2.2	3	2.9		-	-	-	-
CRP (mg/dl)	276	39	-	-	-	-	-	-	-
ESR (mm/h)	40		-	-	-	-	-	-	-
K (meq/L)	4.5	4.1	4.7	3.4	5.2	3.9	2.8		
Na (meq/L)	126	128	124	129	131	134	135		
AST (U/L)	318	-	-	-	-	-	-	-	-
LDH (U/L)	4261	-	-	-	-	-	-	-	-
PT (Sec)	19.5	20	15	>60	13	-	-	-	-
PTT (Sec)	>120	>120	>120	>120	>120	-	-	-	-
INR (U)	1.90	1.98	1.26	13	1	-	-	-	-
Lactate (mg/dl)	5.5	8	4	14	6.2	10	-	-	-
pH	7.43	7.42	7.37	7.37	7.37	7.37	7.07	7.23	-
PCO2 (mmHg)	12.9	16.6	22	29	35	82	51	-	-
HCO3 (meq/L)	8.4	10.8	12.8	16.6	26	23	21	-	-

Furthermore, due to the deterioration of the patient's condition, rise in CRP levels, and organ necrosis, an epinephrine infusion of 0.05-0.5 mcg/kg/min was initiated for the patient. Additionally,the antibiotics were changed to Linezolid 10 mg/kg every 8 hours, Piperacillin/tazobactam (Tazosin) 100 mg/kg every 8 hours, and Colistin 30000 units/kg for every 8 hours.

On the fifth day of hospitalization, the patient was intubated due to worsening respiratory distress. A Color Doppler ultrasound examination of the kidneys did not show any stenosis in the arteries, and normal arterial flow was observed on both sides.

The patient underwent resuscitation on the eighth day of hospitalization, which unfortunately was not successful and the patient died.

The following was reported in the echocardiogram: normal-sized four chambers, trivial mitral regurgitation (MR) and tricuspid regurgitation (TR), minimal pericardial effusion, acceptable ejection fraction (EF), normal-sized coronary artery, normal size aorta and pulmonary artery.

Coagulation profile tests and rheumatological tests were conducted to check for vasculitis, but no pathological findings were determined.

3- DISCUSSION

Most cases of varicella in healthy children are self-limiting and uncomplicated, and early antiviral therapy can shorten the duration of the disease. Treatment for uncomplicated varicella in children usually involves symptomatic relief (6). Varicella zoster virus (VZV) belongs to the Herpesviridae family and leads to chickenpox, a common childhood disease (7).

In this report, a child was hospitalized with symptoms of chicken pox, but evidence of thrombosis was observed during treatment. All organs were checked for simultaneous thrombosis, just for control. Changes in skin color and lack of palpation of the peripheral pulse occur in the course of arterial thrombosis and can be expected, and these symptoms are completely consistent with arterial thrombosis. However, thrombosis did not occur during hospitalization and treatment.

Complications such as pneumonia and septic shock were identified during treatment. While these complications are rare in children, but acute and complicated complications of chicken pox are more common in adults. For example, in a case report, a previously healthy 63-year-old man with chicken pox developed pneumonia and respiratory failure requiring mechanical ventilation. During hospitalization, the patient developed spontaneous thrombosis of the popliteal artery, eventually leading to amputation of the femur. Varicella pneumonia and peripheral artery thrombosis are two well-known complications of chickenpox (7).

Varicella is a disease with potentially severe complications. A prospective cohort study was conducted from May 2011 to April 2014, with a total of 669 patients admitted. The average age of patients was 2.7 years. The main reasons for hospitalization were bacterial complications (77.7%), viral complications (11.4%), and high-risk patients (10.9%). The primary bacterial complications were skin infection and pneumonia. Of the total patients, 44 (6.6%) were admitted to the intensive care unit and 5 (0.8%) died due to septic shock. Thrombocytopenia was associated with more severe disease in patients with bacterial infections (P=0.001). A longer time interval between infection onset and hospitalization was linked to the need for special care in all groups (P=0.007). Secondary bacterial

infection was the main reason for hospitalization, and thrombocytopenia in these patients led to worse outcomes (8).

The statistics from this study show, complications leading to death from chicken pox in children are very rare.

Thrombotic microangiopathy is a life-threatening condition caused by platelet microthrombus formation in small vessels. There are few reports of an association between thrombotic microangiopathy and VZV infection. This type of infection is rare in individuals age 20 and older, and thrombotic microangiopathy due to infection is more commonly reported in children (9).

In a case report, a 46-year-old woman with a history of asthma and smoking was admitted to the hospital. The patient had blistered rashes all over her body and had been diagnosed with chicken pox two days prior. She presented with fever, chills, night sweats, progressive dyspnea, and pleuritic chest pain. An ultrasound of the lower extremity veins showed no evidence of deep vein thrombosis bilaterally. A chest CT revealed bilateral diffuse nodular infiltrates and evidence of pulmonary embolism. The mortality rate of varicella pneumonia can range from 10 to 30%, and in cases requiring mechanical ventilation, it can reach up to 50%. This study aimed to rapidly diagnose varicella zoster lung infection through chest imaging to reduce mortality from complications such as varicella pneumonia (10).

Badour et al. reported a case involving a 5-year-old female with vesicular lesions who complained of excessive sleep, ataxia, vomiting, and headache. Left hemiparesis and hemorrhagic infarct in the left temporo-parietal region, thrombosis of the left transverse sinus, sigmoid sinus, and internal jugular vein were revealed in examinations. This study stated that cerebral venous thrombosis caused by primary (VZV) infection is very rare (1).

4- CONCLUSION

Chickenpox is a common infectious disease in children, but it can sometimes lead to potentially serious complications such as arterial thrombosis. Clinicians should be vigilant about these cases to protect patients from the risks associated with these rare complications through early diagnosis and optimal treatment management.

5- FUNDING

We did not receive any funding for this case report.

6- CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflicts of interest.

7- AUTHERS' CONTRIBUTIONS

All authors were equally involved in conducting the research, and M.N. wrote the case report.

8- REFERENCES

1. Badour M, Shhada E, Hammed A, Baqla S. Cerebral venous sinus thrombosis as a complication of primary varicella infection in a child, case report. Annals of Medicine and Surgery. 2022 Jan 1;73.

2. Çakan M, Ayaz NA, Yıldırım T, Genç HS, Er A, Keskindemirci G. A case of chickenpox complicated with subacute osteomyelitis. Marmara Medical Journal. 2016 May 1;29(2):110-3.

3. Gershon AA, Breuer J, Cohen JI, Cohrs RJ, Gershon MD, Gilden D, et al. Varicella zoster virus infection. Nature reviews Disease primers. 2015 Jul 2;1(1):1-8.

4. Liyanage NP, Fernando S. Seroprevalence of varicella zoster virus infections in Colombo district, Sri Lanka.2007;61(3):128-34.

5. Shaukat A, Ahmed U, Aamir H, Ismail U, Jahangir M, Ahmad A. Various Complications of Chickenpox in Admitted Patients; 2017 Perspective. Annals of Punjab Medical College. 2020 Dec 31;14(4):292-4.

6. Aebi C, Ahmed A, Ramilo O. Bacterial complications of primary varicella in children. Clinical infectious diseases. 1996 Oct 1;23(4):698-705.

7. Smithson A, Ruiz J, Ramos X, Niño E, Armestar F. Varicella pneumonia associated with spontaneous popliteal arterial thrombosis in an adult: a case study and review of the literature. JMM Case Reports. 2014 Sep;1(3):e003640.

8. Diniz LM, Maia MM, Oliveira YV, Mourão MS, Couto AV, Mota VC, et al. Study of complications of varicella-zoster virus infection in hospitalized children at a reference hospital for infectious disease treatment. Hospital Pediatrics. 2018 Jul 1;8(7):419-25.

9. Luqman N, Bakie R, Gaba WH, Athar S. Thrombotic Microangiopathy Secondary to Disseminated Varicella Zoster Virus Infection in an Adult Patient. The American Journal of Case Reports. 2022 Aug 23;23:e936294-1.

10. Kedzia A, Yousuf H, Pattisapu akk, srinivasan l, banu m. varicella-zoster virus leading to an uncommon varicella pneumonia. Chest. 2023 Oct 1;164(4):A1008-9.