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Fatal Disseminated Varicella with Encephalitis and Multi-Organ Dysfunction: A Case Report

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Abstract: ***We report a fatal case of disseminated varicella infection in a 34-year-old woman with comorbidities including type 2 diabetes mellitus, hypertension, and hypothyroidism. The patient presented with abdominal pain, fever, vesicular rash, and altered sensorium, later progressing to acute hypoxic respiratory failure, renal and hepatic dysfunction. Despite aggressive therapy, she succumbed to multi-organ dysfunction syndrome. This case underscores the need for early recognition and prompt treatment of varicella complications in high-risk adults.***

Keywords: Varicella-zoster virus, Disseminated varicella, Varicella encephalitis, multi-organ dysfunction syndrome, adult varicella

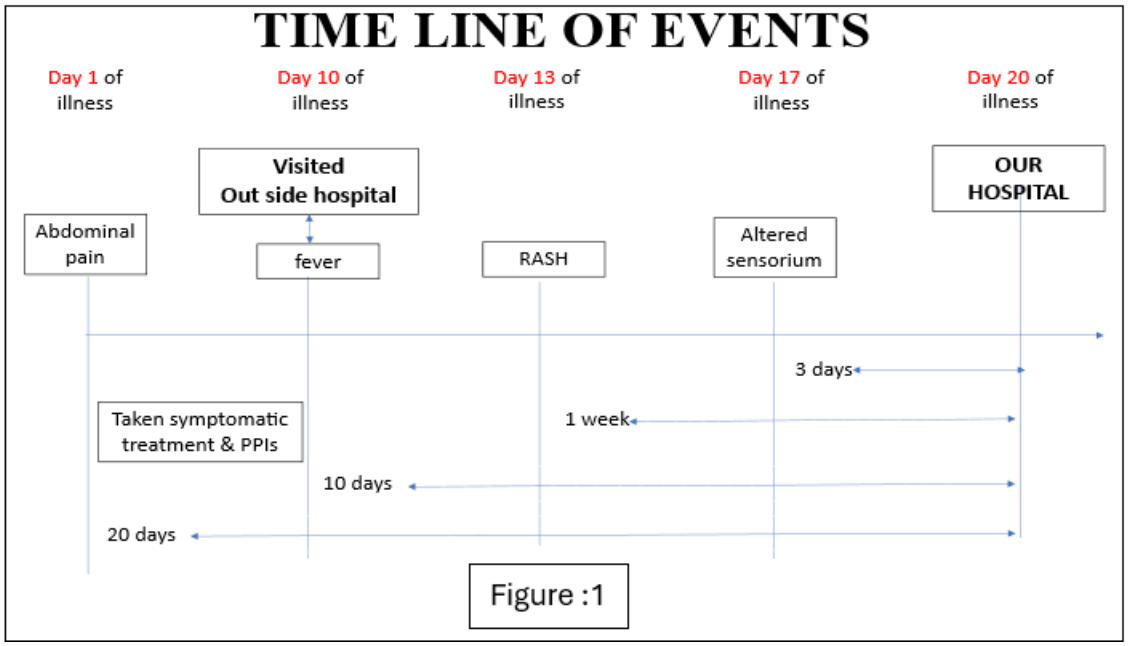
1. Introduction

Varicella-zoster virus (VZV) infection typically causes a self-limiting illness in children. However, in adults—especially those who are immunosuppressive—it can result in severe and disseminated disease involving the skin, lungs, liver, kidneys, and central nervous system (CNS) [1]. Varicella encephalitis, although rare, carries high morbidity and mortality [2]. We report a case of fatal disseminated varicella infection in a 34-year-old female with multiple metabolic comorbidities.

2. Case Presentation

A 34-year-old woman with a history of type 2 diabetes mellitus, hypertension, and hypothyroidism presented to the emergency department (ED) with a 20-day history of severe, abdominal pain, rated 9/10 in severity, since 20 days. The pain was insidious in onset, spasmodic in nature Associated with low back ache, and was intermittent, with no clear relation to food intake. It was partially relieved with medication, associated with constipation**,** characterized by infrequent bowel movements (once every 2 days) with passage of hard stools for which taken analgesics, proton pump inhibitors prescribed by a primary care physician. she was not evaluated in a hospital setting for her abdominal pain

The patient reported intermittent low-grade fever for past 10 days, associated with generalised myalgias. Followed by Rash began on chest & trunk one-week prior, sudden onset gradually progressed to face then spread to rest of body associated with itching. Patient developed altered sensorium 3 days prior to admission (shown in figure :1) associated with drowsiness & confusion (GCS-E3V4M6)? Viral Encephalitis. she reported no contact with chickenpox prior to onset of symptoms. She received all childhood immunization, but she was not immunized against chicken pox



Skin exam revealed multiple crusted papules over trunk and face (Figure 2,3,4). She developed respiratory distress and was intubated.

Figure 2, 3, 4
2-Multiple hyperpigmented macules & crusted papules over the face
3-upper chest
4-Multiples crusted papules over back of trunk

She had Past history of S/P 2 LSCS (P2L2) and Tubectomy, her **Menstrual and Obstetric History**-Regular menstrual cycles (4-5 days duration, 28-day interval), Last menstrual period (LMP): 6 days before day of admission in our hospital, No history of dysmenorrhea or abnormal bleeding

On initial assessment to our hospital, the patient was drowsy and not oriented, with vital signs of (BP: 140/100 mmHg, HR: 92 bpm, RR: 54 breaths/min, Temp: 38.8 °C, SpO2: 80% with room air). Examination revealed significant tenderness localized to the epigastric region without guarding or rebound tenderness. Laboratory results at presentation (Table 1). **ABG:** Type 1 respiratory failure.

Initial imaging, including ultrasound-reveals Hepatomegaly with Grade – I fatty liver, Mild splenomegaly, well defined oval hypoechoic structure with central echogenic stroma abutting head of pancreas –likely enlarged periportal lymph node, Small complex ovarian cyst.

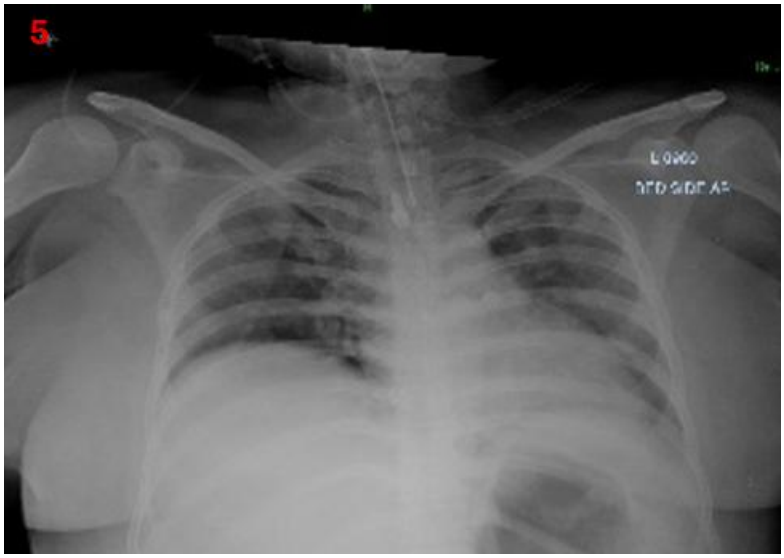


Figure 5

Chest Xray poor inspiratory AP radiograph showing right hilar prominence, bilateral free costophrenic angles, domes of diaphragm well outlined, with endotracheal tube insitu chest X-ray was done post intubation (Figure. 5)

2D Echo: EF 50%, paradoxical septal motion, moderate TR, Neuroimaging **and CSF** could not be performed due to instability

The patient developed altered mental status with decreased Glasgow Coma Score (GCS), Empiric intravenous acyclovir therapy (renal adjusted), antibiotics (meropenem, Cefoperazone Sulbactam), supportive care (IV fluids, antiepileptics, insulin infusion, bicarbonate, sevelamer) and intensive care management were promptly initiated.

Despite maximal supportive interventions including mechanical ventilation, and vasopressor support for refractory shock, the patient's condition progressed rapidly to multiorgan failure, and acute respiratory failure. The patient unfortunately passed away due to cardiac arrest and multi-organ failure.

Table 1: Investigations in successive days

Parameter	Day 13	Day 15	Day-18	Day-20	Day-21	Normal range
Haemoglobin(gm%)	14.9	13	11	9.7	5.7	11.9-15
Total Leukocyte Count (cells/ µL)	3210	3480	3520	6800	6500	4-11
Platelet Count(lakhs/µL)	1.50	1.42	1.49	284	386	150-400
Total Bilirubin(mg/dl)	1.4	3.6	4.1	1.5		0-2
Direct Bilirubin(mg/dl)	0.8	3.3		1.2		0-0.2
SGOT(U/L)	307	417		85		<31
SGPT(U/L)	386	997		114		<34
ALP(U/L)	125	61		125		42-98
Albumin (g/dl)	3.8	3.6	3.1	3.3		3.5-5.5
Urea (mg/dl)				229	227	18-45
Creatinine(mg/dl)	0.5	2.9	3.5	4.4	4.5	0.7-1.4
Sodium (meq/L)	134	136	143	146	144	136-145
Potassium(meq/L)	5.6	6.5	5.3	8.0	6.1	3.5-5.1
Chloride(meq/L)	103	109	119	110	112	96-105
Calcium(mg/dl)			9.4			8.6-10.2
Phosphorus(mg/dl)		5.3				2.5-4.5
ABG-pH	7.4			7.1	7.33	7.4
ABG-pCO2	25			23	29	40
ABG-HCO3	14			18	18	24
ABG-pO2	73			213	45	
SpO2 fio2	@Room air			@100%	@50%	
Blood Sugar (GRBS)	214					
Urine Microscopy	RBC-nil WBC – 6-8 Protein 1+			RBC – 6 Wbc-4 Protein 1+ {Seen for acyclovir crystals} (Figure 7)		
SEROLOGY						
Dengue – IgM		Non-reactive				

Dengue – IgG		POSITIVE (2.367) by ELISA				
PV/PF Ag rapid kit			negative			
Smear for MP/MF			negative			
Widal			1:20			
Leptospira IgM & IgG		Non-reactive				
Typhus-IgG		Non-reactive				
Typhus-IgM		Equivocal (0.28) by ELISA				
Varicella zoster			IgM POSITIVE (34.8) By ELISA Positive->11			
Viral panel						
HbsAg			Negative			
HIV 1&2 antibodies			Non-reactive			
HCV			Non-reactive			
HBA1C	8.0					
TSH	1.73					
CRP	107					
Procalcitonin		3.86				
Blood C/S			Negative			
Blood C/S			negative			
PT	13.5	14.4				9.5-13
INR	1.18	1.26				0.8-1.5

Abbreviations: PT sec– Prothrombin Time (in seconds), INR– International Normalized Ratio, ALT– Alanine Aminotransferase, AST– Aspartate Aminotransferase, HCV– Hepatitis C Virus, HbSag– Hepatitis B surface antigen, HIV– Human Immunodeficiency Virus

Postmortem Findings:

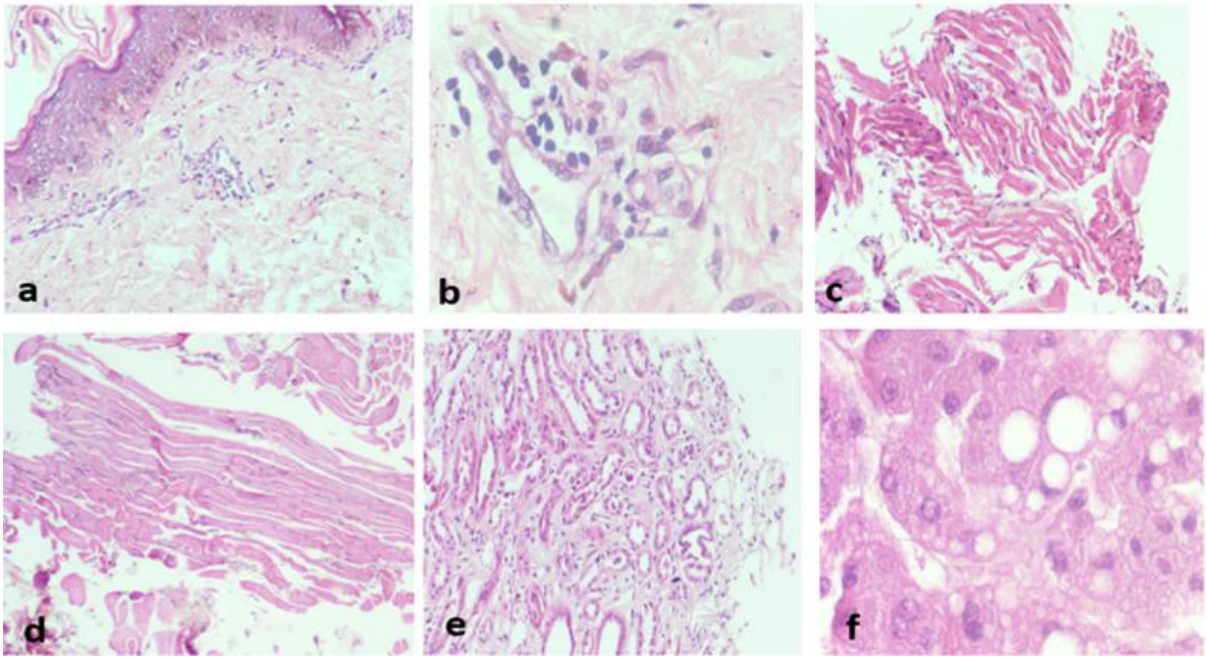


Figure 6: Post Mortem Histopathology Images of a, b-Skin, c-Lung, d-Heart, e-Kidney, f-Liver

Figure 6:

a, b-Skin: Epidermal thinning, spongiosis, multinucleated giant cells (consistent with varicella)
c-Lung: Bilateral pneumonia with necrotic areas
d-Heart: Myocarditis with neutrophilic infiltrates
e-Kidney: Acute tubular necrosis with thyroidisation
f-Liver: Ballooning degeneration, macro vesicular steatosis, periportal fibrosis

Post mortem examination confirmed systemic varicella involvement, with histopathological findings of multinucleated giant cells in the skin, necrotizing pneumonia, myocarditis and acute tubular necrosis. these findings are consistent with previously documented fatal varicella.

3. Discussion

This patient had classical signs of disseminated varicella in an immunocompromised adult. Varicella encephalitis often presents with altered sensorium and can be fulminant [3]. While CSF analysis and neuroimaging are diagnostic tools, they could not be performed here due to critical illness.

The mortality of varicella-related encephalitis ranges from 5–20%, and disseminated disease in adults is associated with higher risk of death, especially in patients with diabetes or immune suppression [4, 5]. Early acyclovir therapy has shown to improve outcomes, though renal toxicity can be a concern [6]. In this case, the patient developed non-oliguric AKI, due to systemic inflammation not as of acyclovir toxicity (figure 7).

This case underlines the importance of:

- Early suspicion and antiviral initiation
- Varicella vaccination in high-risk adults
- Close monitoring for renal and neurologic complications

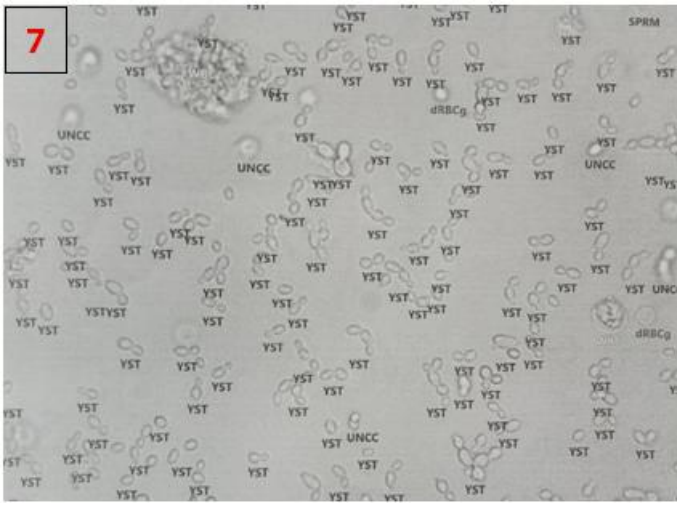


Figure 7

Urine examination under microscopy showing no acyclovir crystals
YST-yeast cells,WBC-White blood cells, UNCC-unclassified casts

4. Conclusion

Disseminated varicella infection in adults, though rare, can be rapidly progressive and fatal. Clinicians must recognize the signs early, initiate antiviral therapy promptly, and consider vaccination in vulnerable populations. Comprehensive ICU support is crucial in managing multi-organ involvement.

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