Case Report

A case of puerperal sepsis due to ESBL E. coli with multi-organ involvement: A clinical challenge

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Abstract

We report a complex case of puerperal sepsis in a 22-year-old primigravida woman, caused by an ESBL (Extended Spectrum Beta-Lactamase) producing Escherichia coli, leading to multi-organ dysfunction. The patient developed acute liver injury, thrombocytopenia, and peripartum cardiomyopathy following a vacuum-assisted vaginal delivery at a peripheral hospital. She presented clinical signs of systemic infection including fever, jaundice, dizziness, foul-smelling vaginal discharge, and hypertension. Laboratory and microbiological investigations confirmed the presence of a resistant strain of E. coli from vaginal swab and pus samples. Intensive multidisciplinary management, including supportive care and targeted antibiotic therapy, resulted in full recovery. This case highlights the critical importance of early detection and appropriate treatment in managing postpartum sepsis caused by drug-resistant organisms.

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1. Background

Puerperal sepsis remains a significant cause of maternal morbidity and mortality, particularly in low-resource settings. It typically results from polymicrobial infections following childbirth, especially in cases involving prolonged labor, operative delivery, or inadquate aseptic techniques. The emergence of multidrug-resistant organisms, such as ESBL-producing E. coli, has further complicated the management of postpartum infections. These organisms are capable of causing severe systemic infections and rapid progression to multi-organ failure if not promptly identified and managed. Early clinical suspicion, timely microbiological diagnosis, and a coordinated, multidisciplinary approach are essential to improve patient outcomes in such high-risk cases.

2. Case Presentation

A 22-year-old primigravida woman underwent a full-term vacuum-assisted vaginal delivery with episiotomy at a peripheral hospital on December 7, 2024. The procedure was reportedly uneventful, and she was discharged on the same day.

However, by the 8th postpartum day (December 15, 2024), she presented to our facility with complaints of:

- Dizziness
- High-grade fever

- Hypertension
- Jaundice
- Foul-smelling vaginal discharge

Allergies

No known medicine or environmental allergies

Past Medical History

Nil

Family History

No family history of similar disorders.

2.1 Physical Examination

Vital signs Temp: 98.9◎F, HR:75/min, RR:22/min BP 110/70 mmHg Spo2 :100%

- A: Patient vocalizing, no obstruction in airways
- B: Spontaneous, bilateral, depth adequate, RR:16/min
- C: All peripheral pulses present.HR 75/min BP 110/70 mm Hg, Icterus and pedal edema and toxic, hypotensive were noticed.
- D: Neurological Examination. She was alert but weak, GCS 15/15
- E: No pressure injury and no other external injury noted

Uterine involution was delayed and tenderness was present. Cardiovascular examination revealed tachycardia and mild basal crepitation's.

3. Investigation

Culture Aerobic pus - *E. coli*

Vaginal swab - *E. coli*

POCUS

Hepatomegaly with grade I fatty change

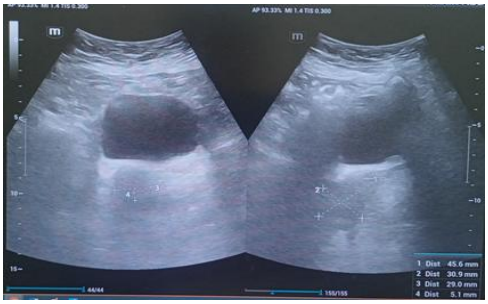
Mild right hydronephrosis

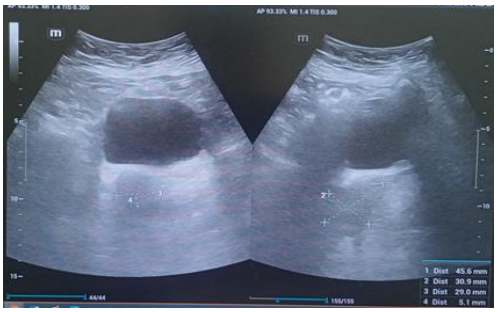
3.1 Markable investigations

Bicarbonate	18 mEq/L
Calcium Serum	7.3 mg/dL
Chloride	107 mmol/L
Chloride Blood	116 mEq/L

Creatinine	0.69 mg/dL
Globulin	2.04 g/dl
Indirect Bilirubin.	1.26 mg/dL
Phosphorous	4.1 mg/dL
Potassium	3.4 mmol/L
Procalcitonin	> 100.00 ng/mL
Sodium	138 mmol/L
Total Protein	4.93 g/dl
Total Vitamin B12	228 pg/mL
Troponin I (Quantitative)	3.0 ng/mL
Urea Serum	66.34 mg/dL
Uric Acid	5.54 mg/dL
(MCH) Mean Corpuscular Haemoglobin	34.2 pg
Absolute Lymphocyte Count (ALC)	1070 cells/µl
Control (PT)	11.2 Seconds
Fibrinogen	216.5 mg/dL
Mean Platelet Volume (MPV)	12.4
Packed Cell Volume (PCV)	23.30%
Platelet Count	44000 Cells/Cumm
Test (APTT)	41.0 Seconds
Test (PT)	17.2 Seconds
Test (PT)	13.4 Seconds
CA++(7.4)	0.80 mmol/L
Direct Bilirubin	3.23 mg/dL
Total Bilirubin	4.49 mg/dL

3.2 Imaging examination - USG





4.Follow up treatment

Continued oral antibiotics based on culture results

Cardiology follow-up for ongoing evaluation of cardiac function

Postnatal counseling and education on warning signs of infection.

Drugs	Dose
Tab. Clindamycin	600mg
Tab. Faronem	200mg
Tab. Pan	40mg
Tab. Ursocol	300mg
Tab. Acyclovir	400mg

5. Management

5.1 Initial Stabilization

ICU admission for continuous monitoring and supportive care

Hemodynamic support with IV fluids and vasopressors for hypotension

Oxygen therapy to maintain adequate oxygen saturation.

5.2 Initial Assessment and Monitoring

Continuous monitoring of vital signs: BP, HR, RR, temperature, SpO_2

Monitor for signs of septic shock, altered mental status, and respiratory distress

Assess lochia, episiotomy site, and presence of vaginal discharge

Regular assessment of intake and output, fluid balance, and edema

Monitor for jaundice progression and bleeding tendencies

5.3 Antimicrobial Therapy

Empirical broad-spectrum IV antibiotics started immediately

Antibiotic regimen tailored to culture sensitivity once ESBL-producing E. coli identified

Carbapenems (e.g., Meropenem) used as definitive therapy

Monitoring for antibiotic efficacy and side effects.

5.4 Management of Multi-Organ Dysfunction

Acute liver injury: Liver function monitoring, supportive therapy (e.g., lactulose if, encephalopathy)

Thrombocytopenia: Platelet monitoring, transfusion if indicated

Peripartum cardiomyopathy

5.5 Supportive Management

Nutritional support (oral or enteral feeding as tolerated)

Analgesics and antipyretics for pain and fever control

Anticoagulation prophylaxis if indicated and not contraindicated

5.6 Infection Control and Antibiotic Administration

Strict aseptic technique during all procedures

Collect vaginal swabs and pus samples as per primary advice

Administer IV antibiotics as prescribed, monitor for adverse reactions

Educate the patient and family on infection prevention practices

5.7 Supportive Care

Provide nutritional support (oral)

Position to enhance comfort and cardiac function (semi-Fowler's)

5.8 Cardiovascular and Hepatic Monitoring

Regular ECG and cardiac monitoring for signs of arrhythmia or heart failure

Monitor liver function tests (LFTs) and signs of hepatic encephalopathy

Administer medications to support cardiac function and liver protection as prescribed

5.9 Emotional and Psychological Support

Provide emotional reassurance and psychological support to the patient and family

Involve counseling services if necessary

Encourage family involvement in care

5.10 Health Education and Discharge Planning

Educate about postpartum hygiene, signs of infection, and medication adherence

Instruct on wound care for episiotomy

Emphasize the importance of follow-up visits with obstetrician and cardiologist

Provide guidance on nutrition and rest during recovery

6.Conclusion

This case highlights the complexity and severity of puerperal sepsis caused by ESBL-producing E. coli, especially when complicated by multi-organ involvement such as acute liver injury, thrombocytopenia, and peripartum cardiomyopathy. Early recognition, prompt initiation of targeted antibiotic therapy, and a multidisciplinary approach were crucial for te patient's full recovery. It underscores the importance of strict aseptic practices, timely microbiological diagnosis, and intensive nursing care in managing postpartum infections. Vigilance in the postnatal period and proper care at peripheral centers can prevent life-threatening complications.