Anesthetic decision-making under diagnostic uncertainty in suspected pregnancy-associated thrombotic microangiopathy with intrauterine fetal demise

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Thrombotic Microangiopathy (TMA) in Pregnancy

- Thrombotic microangiopathy (TMA) is a clinical syndrome characterized by the triad of microangiopathic hemolytic anemia, consumptive thrombocytopenia, and organ ischemic damage resulting from microvascular thrombosis.
- Incidence in pregnancy is rare (approximately 1 per 20,000–200,000 pregnancies) and potentially life-threatening
- TMA encompasses various etiologies, including TTP, aHUS, and STEC-HUS. Because the differential diagnosis is time-consuming, multidisciplinary management must proceed concurrently with the diagnostic workup and treatment.
- In Japan, IUFD cases are frequently managed solely by obstetricians, which can delay timely multidisciplinary coordination.

We report a 36-weeks IUFD case transferred with severe preeclampsia, where an early multidisciplinary approach facilitated the complex differential diagnosis of TMA and enabled preemptive management.

Case 33 y.o G1P0 36+5 weeks IUFD

36+4 weeks: Abdominal pain, decreased fetal movements

36+5 weeks: IUFD diagnosed, transfer

BP **193/115 mmHg** BT **36.8 ℃** SpO_2 **99 %**

HR **80 bpm** RR **20 /min**

No diarrhea, no bloody stool, and no rash

No external bleeding and no uterine contractions

Transabdominal ultrasound:
no placental thickening ,retroplacental hematoma

After admission: Induced vaginal delivery

WBC	11800 /μL	AST	60 U/L	T-Bil	1.7 mg/dl
Hb	11.8 g/dl	ALT	29 U/L	UA	6.3 mg/L
Ht	34.6%	LDH	635 U/L	TP	6.0 g/dl
Plt	**93×10⁹/L**	Alb	3.0 g/dl	Na	138 mEq/L
		BUN	17 mg/dl	K	4.7 mEq/L
		Cr	**1.24 mg/dL**	Cl	108 mEq/L

Divergent Clinical Assessments

Obstetricians Assessment: Suspected placental **abruption and/or HELLP syndrome.**

Anesthesiologists Assessment: High suspicion for **TMA** (based on thrombocytopenia, hemolysis and AKI).

Preemptive Multidisciplinary Team (MDT) Activated

Intensivist: Prepared for postpartum intensive care management
Nephrology: Prepared for CRRT and plasma exchange
Hematology: differentiating TMA
Midwife: grief care

Peripartum

Hour 0: Diagnostic workup initiated (ADAMTS13, Shiga toxin).
Hour 1: Induction of labor with fentanyl use analgesia and Ca bloker
Hour 6: Vaginal delivery.

Postpartum

Hour 12: Anticipated clinical decline (AST 1050, Cr 3.48, Plt 3.9×10^9/L). Hemodialysis & plasma exchange initiated.
Day 5: ADAMTS13 (69%) and negative Shiga toxin, supported a clinical diagnosis of aHUS.
Day 13: Complement B inhibitor (Iptacopan) initiated.
Day 64: Renal function recovered (Cr 1.09 mg/dL).

Teaching Points for Anesthetic Management in TMA

IUFD + DIC

Thrombotic Microangiopathy

- **TTP**
- **Secondary HUS**
- **aHUS**
- **STEC-HUS**

Other Causes

Placental Abruption

IUFD-related DIC

streptococcal toxic shock syndrome (STSS)

TTP

Pathophysiology:
Severe ADAMTS13 deficiency causing platelet aggregation

Clinical features: MAHA, thrombocytopenia
Diagnostic marker: **ADAMTS13 <10%**

management : plasma exchange
Contraindication : Platelet transfusion

Secondary HUS

Associated conditions:

- Infections
- SLE
- Drug-induced
- Malignant hypertension
- Post-transplantation
- HELLP syndrome

aHUS

Pathophysiology:
Uncontrolled complement activation causing endothelial injury and platelet aggregation

Clinical features: Renal dysfunction predominant, hemolytic anemia, thrombocytopenia
Diagnostic approach:
Diagnosis of exclusion, genetic diagnosis

management : complement inhibitors

STEC-HUS

Pathophysiology:
Shiga toxin–mediated endothelial injury

Clinical features: Diarrhea, bloody stools
marker: **Shiga toxin testing**

management : supportive care

Our Case

Laboratory findings:
- ADAMTS13 activity: 69% (> 10%)
- Shiga toxin: Negative

Clinical course:
- Postpartum persistence of TMA features
- Progressive renal dysfunction
- Exclusion of HELLP syndrome

Conclusion Given the diagnostic complexity of TMA, a proactive, multidisciplinary approach is imperative for early differentiation and optimal peripartum management.