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DIVERGENT OUTCOMES OF RESCUE THERAPEUTIC PLASMA EXCHANGE IN REFRACTORY THYROID STORM: A CASE SERIES

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INTRODUCTION

Managing thyroid storm requires aggressive multimodal therapy. However, options become exceptionally narrow when absolute contraindications to antithyroid drugs (ATDs) exist or standard therapy fails. In these refractory scenarios, therapeutic plasma exchange (TPE) serves as a critical rescue modality to optimize clinical and biochemical status. Despite its use, reported efficacy remains inconsistent.

CASES

A 56-year-old female with Graves' disease presented with thyroid storm (BWPS 60) complicated by high-output heart failure and distributive shock. Deterioration into acute liver failure (ALF) necessitated ATD discontinuation. TPE and Continuous Venovenous Hemofiltration (CVVH) were initiated at 40 hours. Following three TPE cycles, fT₄ (freeT₄) reduced by 6.7, 6.5, and 23% sequentially, leading to marked clinical stabilization and recovery.

A 31-year-old female with Graves' disease presented with thyroid storm (BWPS 90), pneumonia, and refractory tachycardia. Rising transaminases precluded ATD use. TPE was initiated at 48 hours, achieving a 55% fT₄ reduction after 2 cycles and initial clinical stabilization. However, her course was complicated by a subdural hemorrhage requiring craniectomy; she eventually succumbed to nosocomial infection.

A 27-year-old female with Graves' disease presented with jaundice and altered sensorium (BWPS 45). Due to baseline ALF, ATDs were withheld. TPE was initiated early as a bridge to potential liver transplantation, achieving a significant 72% fT₄ reduction after two cycles. Despite biochemical success, she succumbed to irreversible multi-organ failure.

CONCLUSION

Literature indicates that TPE achieves a mean fT₄ reduction of 51.9% over four cycles. Our series demonstrated wide variability (23–72% over 2–3 cycles), reflecting unpredictable clearance dynamics. While TPE is an effective adjunctive tool for rapid biochemical optimization, the ultimate prognosis is heavily contingent on the timing of initiation. As seen in Cases 2 and 3, significant biochemical clearance may not reverse systemic damage once advanced neurological or hepatic failure ensues.