

Utilizing TEG to Optimize Anticoagulation During Cardiopulmonary Bypass in a Patient with Antiphospholipid Syndrome: A Case Report

K.NANYUMBA¹, R. TENURE,MD²

¹ Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, New York, United States

² Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, New York, United States



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AT HOFSTRA/NORTHWELL®

INTRODUCTION

Antiphospholipid Syndrome (APS) is an autoimmune disorder that creates a **paradoxical hypercoagulable state** despite prolonged coagulation times.

Anticoagulation during cardiopulmonary bypass (CPB) in APS patients is difficult due to **unreliable results from Activated Clotting Time (ACT)**.

Thromboelastography (TEG) offers real-time assessment of clot dynamics, providing a **more complete picture of coagulation**. Its use in APS patients undergoing high-risk surgery is an **area of growing interest**.

CASE PRESENTATION

A 52-year-old female with a history of **APS, pulmonary embolism, and a recent STEMI** presented with a **hemorrhagic stroke**. Further evaluation revealed **marantic endocarditis** and severe aortic regurgitation, necessitating an urgent **aortic valve replacement (AVR)**.

INTRAOPERATIVE MANAGEMENT

ACT was the primary monitoring tool, but **TEG was added** due to concerns about ACT accuracy in APS.

Initial **TEG showed a prolonged CKH R time (11.0 min)** vs. normal CK R time (1.3 min), highlighting the **complexity of clotting factor function in APS**. (CKH = with heparinase).

Elevated FLEV and Maximum Amplitude (MA) indicated **hyperfibrinogenemia and preserved clot strength**, confirming a **prothrombotic state**.

TEG enabled tailored heparin titration, balancing bleeding vs. thrombosis risk.

Limitation: TEG turnaround ~30 min vs. ACT < 5 min.

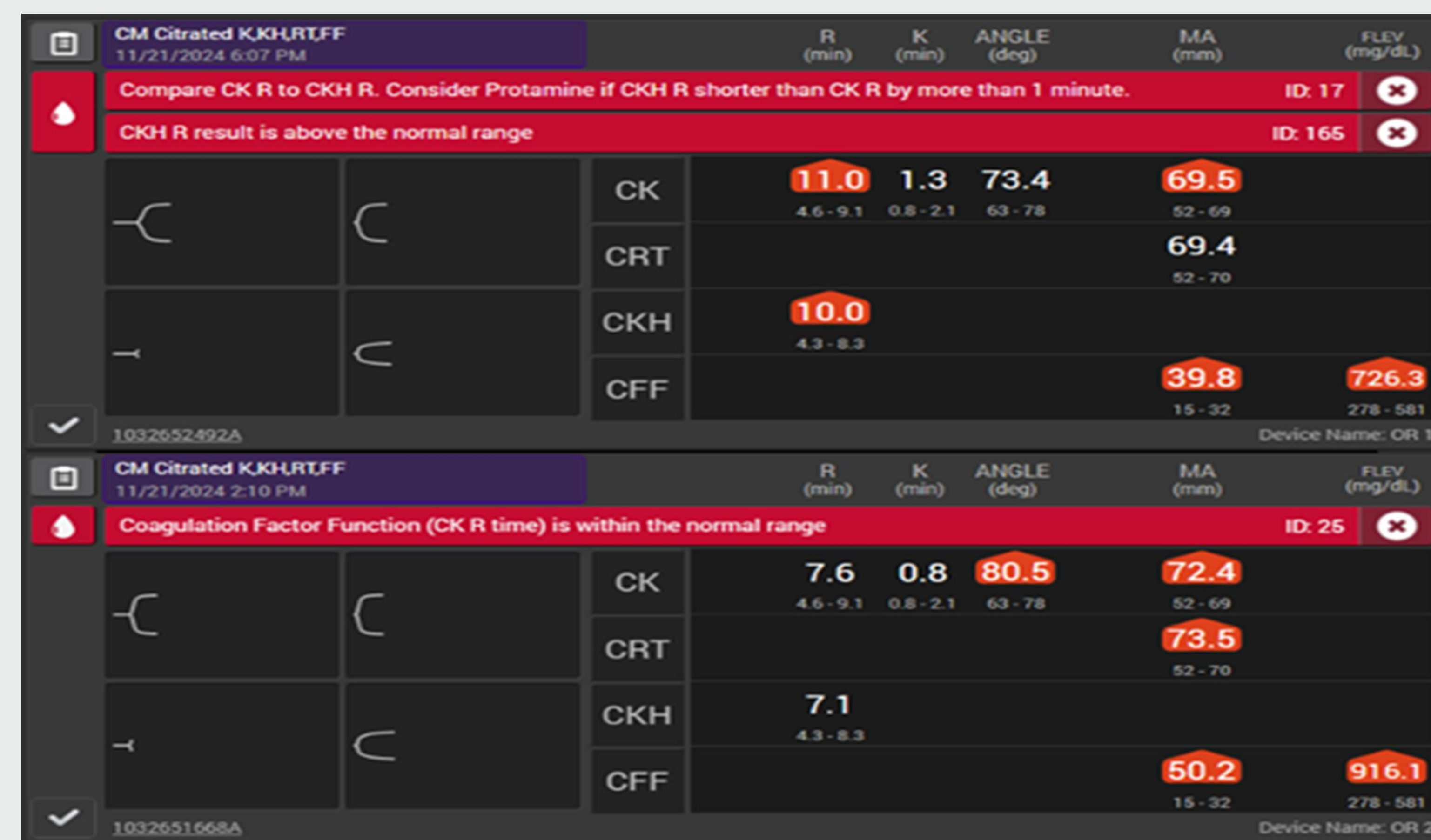


Figure 1. TEG Trends in APS Patient: Comparison of Initial and Follow-Up Parameters

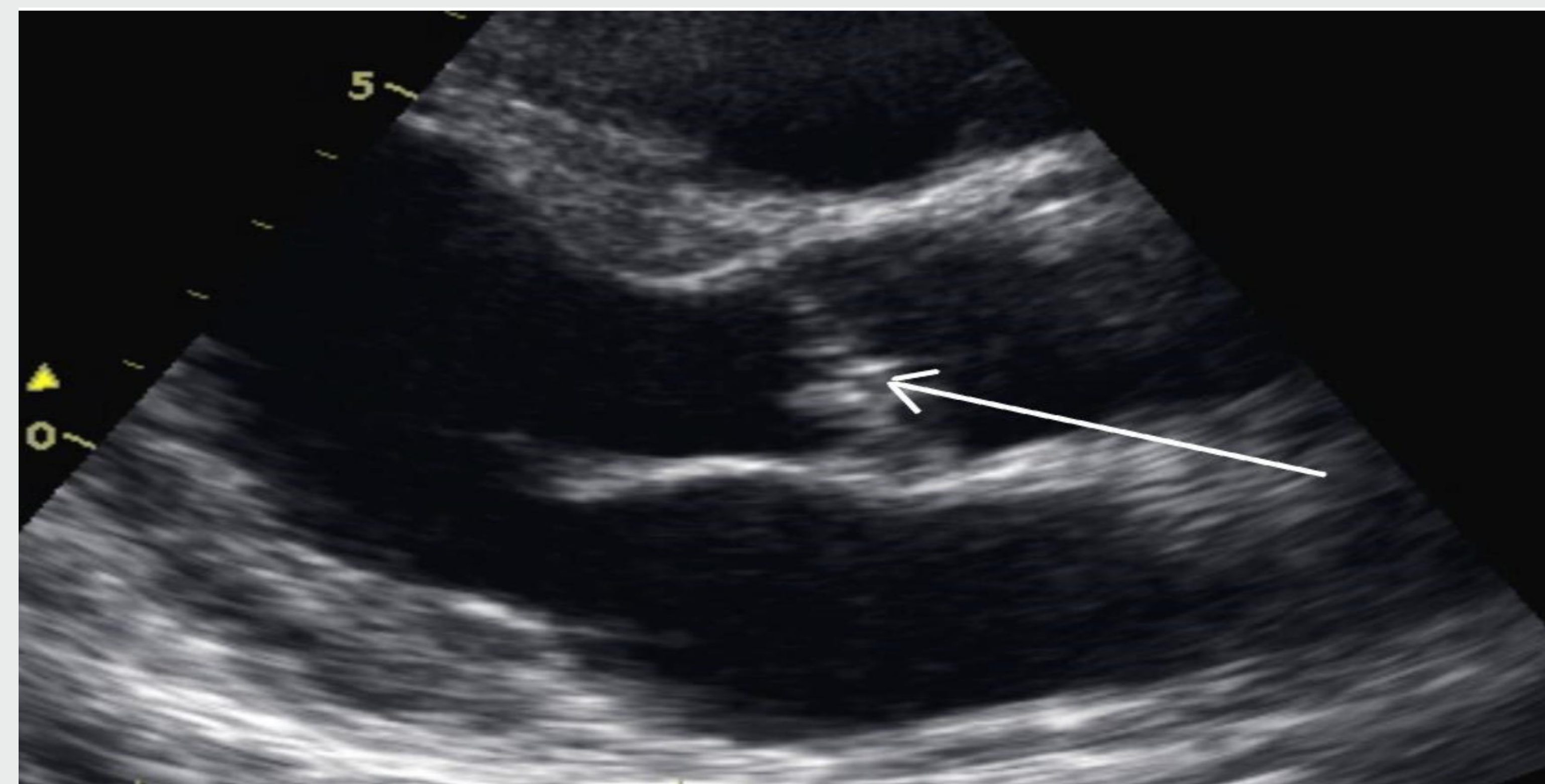


Fig. 2. TTE showing mobile vegetation on tip of Aortic leaflet. (Arrows points to vegetations)

DISCUSSION

Conventional coagulation tests (ACT, PTT) are unreliable in APS due to interference from antiphospholipid antibodies.

TEG provides a dynamic, real-time view of coagulation, capturing abnormalities not detected by standard assays.

TEG is particularly valuable in high-risk cardiac surgery, where rapid, precise management of coagulopathy is critical.

Using ACT together with TEG allows tailored anticoagulation, optimizing heparin dosing for each patient.

This dual-monitoring strategy mitigates the competing risks of thrombosis and bleeding, improving perioperative safety. **The case supports broader integration of TEG in APS patients**, and highlights the need for standardized protocols in cardiac surgery.

CONCLUSION

TEG is a valuable adjunct to ACT for anticoagulation management in APS patients undergoing cardiac surgery.

Factor Xa assays and HMS Hepcon may also provide complementary monitoring.

Proper heparin titration is crucial: avoiding **thrombus in the CPB circuit** prevents embolism, stroke, or other complications.

This case underscores **TEG's ability to reveal the true coagulation state** when lab tests are misleading.

Further research is warranted to establish standardized TEG protocols in APS

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