



## Mini Review

Copyright© Yasin Tire

# Viscoelastic Testing for Clinical Outcomes and Efficacy in Perioperative Bleeding Management: Mini-Review

**Assoc. Prof. Dr. Yasin Tire\***

Department of Anesthesiology and Reanimation, Konya City Hospital, University of Health Sciences, Konya, Turkey - MD

OUTCOMES RESEARCH Consortium®, Houston, Texas, USA. - Member of Consortium

\*Corresponding author: Assoc. Prof. Dr. Yasin Tire, Department of Anesthesiology and Reanimation, Konya City Hospital, University of Health Sciences, Konya, Turkey - MD and OUTCOMES RESEARCH Consortium®, Houston, Texas, USA. - Member of Consortium.

**To Cite This Article:** Assoc. Prof. Dr. Yasin Tire\*. Viscoelastic Testing for Clinical Outcomes and Efficacy in Perioperative Bleeding Management: Mini-Review. *Am J Biomed Sci & Res.* 2025 25(5) AJBSR.MS.ID.003369, DOI: 10.34297/AJBSR.2025.25.003369

**Received:** 📅 February 5, 2025; **Published:** 📅 February 12, 2025

## Abstract

Perioperative hemorrhage is a significant issue across multiple surgical fields, frequently requiring prompt evaluation and action. Traditional coagulation assays (TCAs), including prothrombin time (PT) and activated partial thromboplastin time (aPTT), have been utilized in clinical practice for an extended period. Viscoelastic tests (VETs), such as thromboelastography (TEG) and rotational thromboelastometry (ROTEM), have proven to be superior instruments for directing hemostatic therapy. This mini-review assesses the effectiveness of VETs in minimizing intraoperative blood loss, postoperative bleeding problems, and reaction time in addressing intraoperative hemorrhage.

## Introduction

Hemorrhage management is a critical factor influencing perioperative results. The constraints of CCTs, namely their lack of capacity for real-time assessment of clot formation and dissolution, have resulted in the growing utilization of VETs. These point-of-care assays provide a comprehensive evaluation of coagulation, facilitating individualized and focused treatment approaches [1].

## Intraoperative Blood Loss

Numerous studies have proven the efficacy of VETs in decreasing intraoperative blood loss. VET-guided transfusion techniques in cardiac surgery have demonstrated a substantial decrease in blood product usage relative to CCT-guided regimens. A review demonstrated that the introduction of ROTEM in liver transplantation significantly reduced transfusion requirements and total blood loss ( $P < 0.05$ ). These findings underscore the capacity of VETs to enhance perioperative blood management [2].

## Postoperative Complications Related to Bleeding

Excessive perioperative hemorrhage correlates with elevated morbidity, prolonged hospitalizations, and increased fatality rates. Using VETs in therapeutic protocols has enhanced hemostatic control and diminished bleeding-related problems. Research on trauma and maternal hemorrhage indicates that VET-guided resuscitation techniques lead to decreased reoperation rates and fewer bleeding-related complications [1]. In cardiac surgery, the use of VET has been associated with reduced re-exploration due to hemorrhage, indicating its function in averting subsequent surgical procedures [3].

## Reaction Time to Intraoperative Bleeding

A key advantage of VETs compared to CCTs is the swift turn-



around time for results. Although PT and aPTT may need 30-60 minutes for processing, VETs deliver near real-time data in 10-15 minutes, enabling prompt clinical decision-making. Prompt recognition of coagulopathy facilitates timely and focused therapies, enhancing patient outcomes in high-risk surgical situations, including trauma, liver transplantation, and significant cardiovascular operations [4].

## Conclusion

The research demonstrates the advantage of VETs compared to CCTs in managing perioperative hemorrhage. VETs are essential in contemporary hemostatic methods as they diminish intraoperative blood loss, lower postoperative complications, and facilitate quicker response times. Their routine application in high-risk surgical environments can improve patient safety and optimize blood resource allocation. Future studies should concentrate on broadening

the utilization of VETs across other surgical specialties and incorporating them into standardized perioperative care regimens.

## References

1. Santos AS, Oliveira AJF, Barbosa MCL, dos Santos Nogueira JJJ, JoCA (2020) Viscoelastic haemostatic assays in the perioperative period of surgical procedures: systematic review and meta-analysis. *J Clin Anesth* 64:109809.
2. Hunt H, Stanworth S, Curry N, Woolley T, Cooper C, Ukoumunne O, et al. (2015) Thromboelastography (TEG) and rotational thromboelastometry (ROTEM) for trauma-induced coagulopathy in adult trauma patients with bleeding. *Cochrane Database Syst Rev* 2015(2): CD010438.
3. Agarwal S, Abdelmotieleb MJT (2020) Viscoelastic testing in cardiac surgery. *Transfusion* 6: S52-S60.
4. Cohen T, Haas T, Cushing MMJT (2020) The strengths and weaknesses of viscoelastic testing compared to traditional coagulation testing. *Transfusion* 6: S21-S8.