

Preface

Perioperative Thrombosis and HemostasisBeverley J. Hunt, FRCP, FRCPath, MD¹ Jerrold H. Levy, MD, FAHA, FCCM²¹ Guy's & St Thomas' NHS Foundation Trust, King's College, London, United Kingdom² Anesthesiology, Critical Care and Surgery (Cardiothoracic), Duke University Medical Center, Durham, North Carolina

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The life of an expert in thrombosis and hemostasis is never dull: indeed, some of the most challenging episodes in both of our professional lives have involved managing perioperative hemostatic problems. Both of us have offices close to our respective operative theaters and intensive care units, so a quick jog round after a telephone call asking for assistance with a major bleeding problem is often an illuminating way of helping. Certainly, when dealing with multiple trauma cases that require urgent surgery and/or bleeding critically ill patients, the place of the thrombosis and hemostasis expert is flitting among sites or managing other communication efforts to help ensure best practice in managing bleeding. This includes encouraging regular hemostatic monitoring, enabling fast delivery of blood component and/or tranexamic acid.

Historically, surgery has continued for more than two millennia. The first known descriptions come from the sixth century BC when Sushruta, an Indian physician surgeon, performed cosmetic surgery.¹ However, despite this, until recently there was only limited research as to the best ways to manage patients with intraoperative and postoperative bleeding. The description of the risk of venous thromboembolism being greatly increased after surgery is a relatively new phenomenon in comparison, as most of the documentation is from the 1970s onward.

There are many unanswered questions in relation to the best management to prevent and manage perioperative thrombosis and hemostasis. However, we hope this will change quickly with the many current international research programs dedicated to this area and also the establishment of an International Society of Thrombosis and Hemostasis subcommittee that focuses on this area. We are both proud to be founding members of the organizing committee and are thrilled and excited by the overflowing attendance at the meetings we have held, reflecting the interest in this subject.

We have therefore commissioned a set of articles to reflect current best practice in thrombosis and hemostasis in the many different types of surgery now available. We have enjoyed reading and editing them and hope they will encourage more enthusiasm and research in this rapidly-growing area.

Preoperative Care

Preoperative anemia predisposes to bleeding and Toby Richards and his team discuss how this can be prevented.² There are other special groups of patients who require extra consideration prior to surgery and they include those with inherited and acquired bleeding disorders and their management is discussed by Mensah and Pavord.³ However, the largest groups with preexisting coagulopathies are those who are taking antithrombotic medication. Nikolakopoulos and Spyropoulos discuss how these patients should be bridging anticoagulation based on current evidence.⁴

Intraoperative Care

Major bleeding requiring resuscitation with blood products remains a complication of trauma and surgery and Levy et al discuss the current evidence and guidelines to support the use of plasma products, including prothrombin complex concentrates.⁵ Grottke et al review the use of fibrinogen supplementation⁶ and Thiele and Greinacher assess the utility of platelet transfusion in bleeding in surgery.⁷

Special perioperative situations include management of bleeding in those undergoing cardiac surgery using cardiopulmonary bypass, as covered by the team managed by Teruya et al⁸ and also patients who have suffered trauma. Curry and Brohi discuss the management of patients with trauma who require surgery.⁹

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Postoperative Focus

The chapter by Marc Samama is an up-to-date review of the current state of postoperative thromboprophylaxis in prevention hospital-acquired venous thromboembolism (VTE).¹⁰ He highlights that the rates on VTE after surgery have fallen considerably, not just due to the widespread use of thromboprophylaxis but also due to enhanced surgical and anesthetic techniques and the move to early mobilization and discharge, postoperatively.

Whenever patients undergo surgery there is a risk of sepsis, which enhances risk of thrombosis. Iba et al discuss the current understanding of sepsis-induced coagulopathy and disseminated intravascular coagulation.¹¹

Lastly, we include in this issue an article on clot structure from Mihalko and Brown, who describe the wide variation in clot structure seen in different conditions and patients and how current research is exploring this to inform potential new ways to improve clot formation and clot lysis.¹²

Conflicts of Interest

For J.H.L.: Research steering committees, data safety monitoring boards, on advisory boards for CSL Behring, Instrumentation Laboratories, Octapharma, Leading Biosciences, and Merck.

References

- 1 Sushruta: the ancient Indian surgeon. Available at: <https://hekint.org/2017/01/22/sushruta-the-ancient-indian-surgeon/>. Accessed October 30, 2019

- 2 Abeysiri S, Chau M, Richards T. Perioperative anemia management. *Semin Thromb Hemost* 2020;46(01):8–16
- 3 Mensah PK, Pavord S. Managing preoperative haemostatic disorders in patients with inherited and acquired bleeding disorders. *Semin Thromb Hemost* 2020;46(01):17–25
- 4 Nikolakopoulos I, Spyropoulos AC. Heparin Bridging Therapy for Patients on Chronic Oral Anticoagulants in Peri-procedural Settings. *Semin Thromb Hemost* 2020;46(01):26–31
- 5 Levy JH, Ghadimi K, Waldron NH, Connors JM. Using plasma and prothrombin complex concentrates. *Semin Thromb Hemost* 2020;46(01):32–37
- 6 Grottke O, Mallaiah S, Karkouti K, Saner F, Haas T. Fibrinogen supplementation and its indications. *Semin Thromb Hemost* 2020;46(01):38–49
- 7 Thiele T, Greinacher A. Platelet transfusion in perioperative medicine. *Semin Thromb Hemost* 2020;46(01):50–61
- 8 Fang ZA, Navaei A, Hensch L, Hui SK, Teruya J. Hemostatic management of extracorporeal circuits including cardiopulmonary bypass & extracorporeal membrane oxygenation. *Semin Thromb Hemost* 2020;46(01):62–72
- 9 Curry N, Brohi K. Surgery in traumatic injury and perioperative considerations. *Semin Thromb Hemost* 2020;46(01):73–82
- 10 Samama CM. Postoperative venous thromboembolism prophylaxis: changes in the daily clinical practice, modified guidelines. *Semin Thromb Hemost* 2020;46(01):83–88
- 11 Iba T, Levi M, Levy JH. Sepsis-induced coagulopathy and disseminated intravascular coagulation. *Semin Thromb Hemost* 2020;46(01):89–95
- 12 Mihalko E, Brown AC. Clot structure and implications for bleeding and thrombosis. *Semin Thromb Hemost* 2020;46(01):96–104