

Local Hemostatic Management Using Advanced Platelet-Rich Fibrin Plus and Tranexamic Acid After Surgical Tooth Extraction in a Patient Receiving Rivaroxaban: A Case Report

Anita Ismaili Bimbashi¹; Enis Redjep²; Gazmend Jusufi³; Elza Mucaj^{4*}

¹Department of Oral Surgery, International Balkan University, Skopje, North Macedonia

²Department of Oral Surgery, International Balkan University, Skopje, North Macedonia

³Department of Orthodontics, International Balkan University, Skopje, North Macedonia

⁴PhD Candidate, SS. Cyril and Methodius University in Skopje, North Macedonia

Corresponding Author: Elza Mucaj^{4*}

Publication Date: 2026/10/27

Abstract:

➤ Background:

Dental extraction in patients receiving direct oral anticoagulants requires careful bleeding-risk assessment and local hemostatic measures. Concomitant type 2 diabetes may further complicate postoperative care.

➤ Case Presentation:

A 73-year-old woman with type 2 diabetes, a history of myocardial infarction approximately one year earlier, and rivaroxaban 20 mg prescribed by her cardiologist underwent surgical extraction of tooth 26. Rivaroxaban was reportedly not interrupted. The extraction socket was managed with advanced platelet-rich fibrin plus (A-PRF+), suturing, and compression using gauze soaked in 5% tranexamic acid. Complete hemostasis was recorded after 10 minutes. No recurrent bleeding was documented at 30, 60, or 90 minutes; the available record described no postoperative pain, analgesic use, or edema and favorable wound healing on days 7 and 10. According to the treating author, no recurrent bleeding occurred at 24 or 48 hours.

➤ Conclusion:

In this single case, combined local measures were associated with prompt initial hemostasis. Their individual contributions and comparative effectiveness cannot be established.

Keywords: Advanced Platelet-Rich Fibrin; A-PRF+; Rivaroxaban; Tranexamic Acid; Surgical Tooth Extraction; Case Report.

How to Cite: Anita Ismaili Bimbashi; Enis Redjep; Gazmend Jusufi; Elza Mucaj (2026) Local Hemostatic Management Using Advanced Platelet-Rich Fibrin Plus and Tranexamic Acid After Surgical Tooth Extraction in a Patient Receiving Rivaroxaban: A Case Report. *International Journal of Innovative Science and Research Technology*, 11(10), 1829-1832. <https://doi.org/10.38124/ijisrt/26oct850>

I. INTRODUCTION

Rivaroxaban is a direct factor Xa inhibitor used for thromboembolic prevention and treatment. Oral surgery in anticoagulated patients requires balancing procedure-related bleeding against the potential consequences of changing anticoagulant treatment. Current dental guidance emphasizes assessment of procedural bleeding risk and appropriate local hemostatic measures [1]. Decisions about anticoagulant timing or interruption should be

individualized rather than inferred from a single clinical case.

Platelet-rich fibrin (PRF) is an autologous fibrin-based biomaterial proposed to support clot stabilization and soft-tissue healing. A systematic review reported promising findings in patients receiving antithrombotic medication but highlighted heterogeneous evidence [2]. A separate review did not establish a statistically significant reduction in bleeding complications across the evaluated evidence [3].

Modified low-speed preparation protocols have been investigated for their biological properties [4].

This report describes the perioperative management and documented early postoperative course of a patient receiving rivaroxaban who underwent surgical extraction of a periodontally compromised maxillary molar using A-PRF+, suturing, and topical tranexamic acid. The case is presented in a manner informed by CARE reporting principles [5].

Direct oral anticoagulants have simplified long-term antithrombotic treatment, yet invasive dental procedures still require a patient-specific assessment of bleeding risk, procedure complexity, renal function, and the consequences of modifying anticoagulant therapy. Rivaroxaban inhibits activated factor X, thereby reducing thrombin generation. Its anticoagulant effect is not reliably quantified by the international normalized ratio. Dental guidance emphasizes local hemostatic techniques and careful coordination with the prescribing clinician when the bleeding risk of a procedure is uncertain [1,6].

The oral cavity presents a distinctive hemostatic environment because extraction sockets remain exposed to saliva, mechanical disturbance, and fibrinolytic activity. Local measures commonly include pressure, suturing, and topical hemostatic agents. Tranexamic acid is an antifibrinolytic agent that inhibits plasminogen activation and can support clot persistence at the surgical site. Its topical use is a component of the combined intervention described here; the effect of tranexamic acid cannot be distinguished from that of compression and suturing in a single case [1].

Advanced platelet-rich fibrin plus (A-PRF+) is prepared from autologous venous blood using centrifugation without an added anticoagulant. The resulting fibrin matrix has been investigated as a scaffold for wound healing and local clot support. Experimental work suggests that centrifugation settings influence cell distribution and growth-factor release, but device-specific rotor geometry is necessary to translate revolutions per minute into relative centrifugal force [4]. Systematic reviews of PRF in anticoagulated dental patients have reported heterogeneous clinical findings and do not establish superiority of a particular protocol [2,3].

Type 2 diabetes introduces an additional consideration because glycemic status can influence infection risk and tissue repair. The present case is therefore clinically relevant at the intersection of oral surgery, anticoagulation, and metabolic comorbidity. The objective is to document the actual combined hemostatic intervention, the recorded early outcomes, and the limitations of the available clinical information, following the general reporting principles of the CARE guideline [5].

II. CASE DESCRIPTION

➤ Patient Information and Medical History

A 73-year-old woman with type 2 diabetes mellitus and a myocardial infarction approximately one year earlier was receiving rivaroxaban 20 mg, prescribed by a cardiologist, for approximately one year. The exact indication for rivaroxaban was not specified in the source record. On the day of extraction, capillary blood glucose measured using a glucometer was 9.0 mmol/L (approximately 162 mg/dL).

➤ Clinical Intervention

Surgical extraction of tooth 26 was performed. According to the clinical account, rivaroxaban was not interrupted. A-PRF+ was placed in the extraction socket, sutures were applied, and local compression was performed using gauze soaked in 5% tranexamic acid. A-PRF+ was prepared using a Biobase centrifuge at a reported 1,300 revolutions per minute for 8 minutes. The blood collection volume, tube characteristics, rotor radius, and relative centrifugal force were not specified in the available case record.

➤ Postoperative Follow-up and Outcomes

Complete cessation of bleeding was documented 10 minutes after application of the combined local measures. No recurrent bleeding was recorded at the 30-, 60-, and 90-minute assessments. The patient reportedly experienced no postoperative pain, did not use analgesics, and had no reported edema. Wound healing was described as favorable at the day-7 and day-10 assessments. According to the treating author, no recurrent bleeding was observed at the 24- and 48-hour follow-up assessments.

III. DISCUSSION

This case illustrates the feasibility of achieving early local hemostasis during surgical extraction in a patient with concomitant rivaroxaban therapy and type 2 diabetes. The observed 10-minute hemostasis time reflects a multimodal approach involving A-PRF+, topical 5% tranexamic acid, suturing, and compression. It cannot be attributed to A-PRF+ alone.

Existing reviews indicate that PRF is a potentially useful adjunct in dental extraction settings, although the evidence remains heterogeneous and its ability to prevent postoperative bleeding complications is uncertain [2,3]. Local hemostatic strategies are consistent with dental guidance for patients receiving antithrombotic drugs [1]. The absence of recurrent bleeding at assessments through 48 hours is encouraging, but a single case cannot establish a generalizable bleeding risk.

Important limitations include the single-patient design, no comparison group, an unclear rivaroxaban indication, incompletely characterized glycemic status, and incomplete centrifugation parameters. The absence of standardized pain scores and independent verification of the follow-up assessments further restricts interpretation. The case should

therefore be viewed as a clinical observation rather than evidence of the superiority or isolated efficacy of A-PRF+.

The clinical interpretation of the 10-minute hemostasis time requires attention to the sequence of care. The socket received A-PRF+, was sutured, and was compressed using gauze soaked in 5% tranexamic acid. Because all interventions were delivered together, the observation supports only the feasibility of this combined approach in this individual; it does not demonstrate that A-PRF+ alone shortened bleeding time or prevented complications.

Periprocedural anticoagulant decisions depend on indication and thromboembolic risk as well as procedure-related bleeding risk. European practical guidance addresses the need for individualized decisions in patients receiving direct oral anticoagulants [6]. A large perioperative cohort also illustrates that standardized interruption strategies may be appropriate in selected non-dental surgical contexts [7]; these findings should not be used to infer that interruption was necessary or preferable for the dental extraction reported here. In this case, the treating record states that rivaroxaban was not interrupted, but the indication for the prescription and the timing of the most recent dose were not available.

The 10-minute hemostasis time and the absence of recurrent bleeding at 30, 60, and 90 minutes are based on the clinical record. According to the updated clinical information provided by the treating author, no recurrent bleeding occurred at 24 or 48 hours.

In relation to existing literature, the systematic review by Katz and colleagues suggests a possible supportive role for platelet-rich fibrin, while highlighting variability in techniques and outcome definitions [2]. The review by Cetira Filho and colleagues likewise cautions against assuming a consistent reduction in hemorrhagic complications [3]. These uncertainties are especially important for a report involving only one patient and multiple simultaneous hemostatic interventions.

Additional limitations are the absence of a confirmed rivaroxaban indication, missing renal-function data, the absence of additional glycemic measures, such as HbA1c, and incomplete technical characterization of the centrifugation protocol (including rotor radius and relative centrifugal force).

Clinical implications should therefore remain modest: documenting local measures, verifying anticoagulant history, obtaining relevant laboratory and medical information, and giving clear postoperative instructions may improve the reproducibility and safety of case reporting. Future comparative studies would be needed to estimate the independent contributions of A-PRF+, tranexamic acid, and suturing.

IV. CONCLUSION

In this patient receiving rivaroxaban, combined application of A-PRF+, 5% tranexamic acid-soaked gauze compression, and suturing was associated with complete initial hemostasis after 10 minutes. No recurrent bleeding was reported at 30, 60, and 90 minutes or at the 24- and 48-hour follow-up assessments. These findings describe one case and do not establish the separate effectiveness of any component.

DECLARATIONS

- Consent for publication: The patient provided informed consent for publication of this anonymized case report. No clinical photographs are included.
- Ethics approval: Ethical approval was granted by the Ethics Committee of International Balkan University. An approval reference number was not supplied for inclusion in this manuscript.
- Conflicts of interest: The authors declare that they have no conflicts of interest.
- Funding: This work was self-funded by the authors and received no external financial support, grants, or sponsorship.
- Author contributions: Anita Ismaili Bimbashi was the principal author and provided the clinical case information. Enis Redjep supervised the work. Elza Mucaj and Gazmend Jusufi contributed to manuscript writing. All four authors reviewed and approved the final version of the manuscript and agreed to its submission for publication.

REFERENCES

- [1]. Scottish Dental Clinical Effectiveness Programme. Management of Dental Patients Taking Anticoagulants or Antiplatelet Drugs. 2nd ed. Dundee: SDCEP; 2022. Available from: <https://www.sdcep.org.uk/published-guidance/anticoagulants-and-antiplatelets/>
- [2]. Katz MS, Ooms M, Heitzer M, Steiner T, Bock A, Peters F, et al. Platelet-rich fibrin as a hemostatic agent in dental extractions in patients taking anticoagulants or antiplatelet medication: a systematic review. *Clin Oral Investig*. 2024;28:587. doi:10.1007/s00784-024-05983-x.
- [3]. Cetira Filho EL, Franco JMPL, Ribeiro TR, Silva PGB, Costa FWG. Does platelet-rich fibrin prevent hemorrhagic complications after dental extractions in patients using oral anticoagulant therapy? *J Oral Maxillofac Surg*. 2021;79:2215–2226. doi:10.1016/j.joms.2021.07.003.
- [4]. Fujioka-Kobayashi M, Miron RJ, Hernandez M, Kandalam U, Zhang Y, Choukroun J. Optimized platelet-rich fibrin with the low-speed concept: growth factor release, biocompatibility, and cellular response. *J Periodontol*. 2017;88:112–121. doi:10.1902/jop.2016.160443.

- [5]. Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D, et al. The CARE guidelines: consensus-based clinical case reporting guideline development. *BMJ Case Rep.* 2013;2013:bcr2013201554. doi:10.1136/bcr-2013-201554.
- [6]. Steffel J, Collins R, Antz M, Cornu P, Desteghe L, Haeusler KG, et al. 2021 European Heart Rhythm Association Practical Guide on the Use of Non-Vitamin K Antagonist Oral Anticoagulants in Patients with Atrial Fibrillation. *Europace.* 2021;23(10):1612-1676. doi:10.1093/europace/euab065.
- [7]. Douketis JD, Spyropoulos AC, Duncan J, Carrier M, Le Gal G, Tafur AJ, et al. Perioperative Management of Patients With Atrial Fibrillation Receiving a Direct Oral Anticoagulant. *JAMA Intern Med.* 2019;179(11):1469-1478. doi:10.1001/jamainternmed.2019.2431.