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Original Contribution

MANAGEMENT OF TOOTH EXTRACTIONS IN PATIENTS RECEIVING THE NEW ORAL ANTICOAGULANTS

L. Vladimirova-Kitova[1,2]*, A. Dinkova[3], C. Daskalov[3], S. Kitov[2]

[1]I-st Department of Internal Diseases, Section of Cardiology, Medical University, Plovdiv, Bulgaria
[2]Clinic of Cardiology, St. George University Hospital, Plovdiv, Bulgaria
[3]Department of Oral Surgery, Faculty of Dental Medicine, Medical University of Plovdiv, Plovdiv, Bulgaria

ABSTRACT

Introduction: High bleeding risk procedures pose a serious challenge for dental practitioners treating patients taking some of the novel oral anticoagulants.

Aim: The aim of the present study was to assess clinically the bleeding risk in a typical tooth extraction in patients on monotherapy with one of the new oral anticoagulants rivaroxaban (Xarelto), apixaban (Eliquis), and dabigatran (Pradaxa).

Materials and methods: The study included 30 patients on these anticoagulants who underwent a typical tooth extraction. Local hemostasis was achieved using Surgicel, Haemocollagen or Gelaspon, and suturing the edges of the wound. Clinical evaluation of the bleeding was performed at 10 and 30 minutes, and 24 hours after the extraction. Anticoagulants were discontinued for the day of extraction.

Results: Post-extraction bleeding in the first 10 minutes was observed in 17 patients (56.66%). Bleeding within 30 minutes was observed in 11 patients (36.66%). Two (6.66%) patients reported having only mild oozing within 24 hours. No additional haemostasis was required for any of the patients.

Bleeding in a typical tooth extraction is of capillary origin. Bleeding sites are easily accessible and local hemostatic agents are effective enough to control the bleeding. Discontinuation of the anticoagulant on the day of extraction is sufficient to prevent any adverse events. No abnormal post-extraction bleeding was observed in our study.

Conclusions: If tooth extraction is required in patients taking the new oral anticoagulants rivaroxaban (Xarelto), apixaban (Eliquis) or dabigatran (Pradaxa), the patient can cease the reception of the drug only for the day of the procedure.

Keywords: new oral anticoagulants, tooth extraction, bleeding risk, capillary bleeding

INTRODUCTION

As life expectancy increases, so does the number of patients suffering from diseases requiring anticoagulants. These drugs pose a challenge to dental practitioners when they perform high bleeding risk procedures. As the anticoagulants warfarin and acenocoumarol (Sintrom) are widely used in clinical practice, most dentists are well acquainted with the established protocols for dental treatment in cases of concomitant use of these drugs. (1) Though very successful, they are not without limitations. Searching for more effective molecules to stop bleeding, new oral anticoagulants have been developed - dabigatran, rivaroxaban, and apixaban. However, as there are few relevant studies and just as few established treatment protocols instructing dentists what to do in cases when patients concomitantly taking these drugs along with others are planning to

***Correspondence to:** *Lyudmila. Vladimirova-Kitova, I-st Department of Internal Diseases, Section of Cardiology, Medical University, Plovdiv, Bulgaria, Clinic of Cardiology, St. George University Hospital, Plovdiv, Bulgaria, e-mail: kitov@vip.bg, address: Plovdiv, 4000, Alexander Exarh 2, tel: 0888/651195*

receive a dental treatment there is quite a high potential risk of unexpected bleeding. (1, 2)

Rivaroxaban (Xarelto) is an orally administered direct reversible factor Xa inhibitor that selectively blocks the active site of factor Xa. It is absorbed rapidly reaching maximum plasma concentrations in about three hours after tablet intake. It has a half-life of 6-8 hours (up to 12). Two-thirds of the drug is metabolized in the liver and one-third is excreted unchanged by the kidneys. Factor Xa returns to normal concentrations within about 24 hours. There are no definitive data as to when the drug should be discontinued before elective surgery. Rivaroxaban is not eliminated by dialysis as it exhibits high plasma protein binding. (3)

Apixaban (Eliquis) is a highly selective, reversible, direct factor Xa inhibitor that inhibits both free factor Xa and prothrombinase activity, and clot-bound factor Xa activity. It reaches peak plasma concentrations in 3 to 4 hours and is eliminated mainly through faeces. It has a half-life of 9 to 12 hours. It prolongs PT, INR and PTT, and at the standard therapeutic dose, the changes are small and may vary in different cases. (3-5)

The first antidote to factor Xa inhibitors, apixaban and rivaroxaban, is a drug with the trade name Andexxa approved for medical use in the United States in May 2018. Final benefit/risk balance results are expected in 2023 at the earliest. To date, the antidote to factor Xa inhibitors has not been approved in Europe.

Dabigatran (Pradaxa) is a highly selective, reversible, and potent thrombin inhibitor (factor II). The onset of action begins immediately with a peak plasma concentration at 1 to 3 hours after administration. The terminal elimination half-life of the drug is 12 to 17 hours, and it takes 2 to 3 days to reach steady-state levels. The antidote to dabigatran is idarucizumab. (6-9)

In this study, we aimed at assessing clinically the bleeding in typical tooth extraction in patients on monotherapy with one of the new oral anticoagulants rivaroxaban (Xarelto), apixaban (Eliquis) and dabigatran (Pradaxa).

MATERIALS AND METHODS

The study included 30 patients taking either Xarelto, Eliquis or Pradaxa who underwent a typical tooth extraction.

Patient selection criteria

Including criteria:

- Adults over 18 years of age receiving either Xarelto, Eliquis or Pradaxa for non-valvular atrial fibrillation or tremor.
- Signed informed consent to participate in the study was obtained from each participant.

Excluding criteria:

- Pregnant women,
- reception of other hemostasis affecting medicines,
- inflammation in the area of the tooth to be extracted,
- hypertension > 160/100 mmHg, pulse rate over 100,
- stroke or heart attack less than 6 months before extraction,
- valve prosthetics,
- hemostasis disorders,
- concomitant therapy with cytotoxic drugs.

Study design

All patients taking rivaroxaban (Xarelto), apixaban (Eliquis) or dabigatran (Pradaxa) ceased reception of the specific anticoagulant for the day of surgery. Preliminary laboratory control of clotting was not performed.

The procedure involved a degree 3 surgical trauma (included extraction of up to 3 single-rooted teeth; 1 single-rooted and 1 double-rooted teeth; or 1 three-rooted tooth).

The dental extractions were performed under local anesthesia (local vasoconstrictor anesthetic) given to patients using topical anesthetics where possible.

Methods for establishing local hemostasis.

Local hemostasis was achieved by placing oxycellulose (Surgicel), collagen sponge (Haemocollagen) or gelatin hemostatic sponge (Gelaspon) in the post-extraction wound and suturing the wound edges **(Figures 1, 2, 3)**.

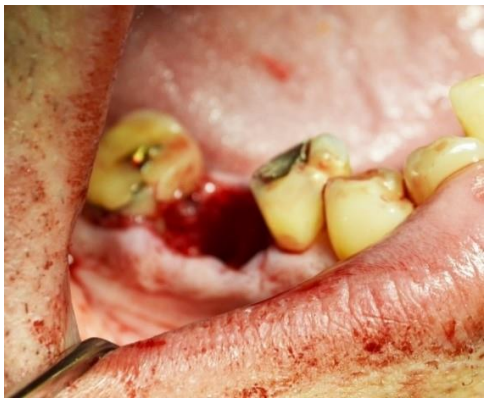

Figure 1. Post-extraction wound.

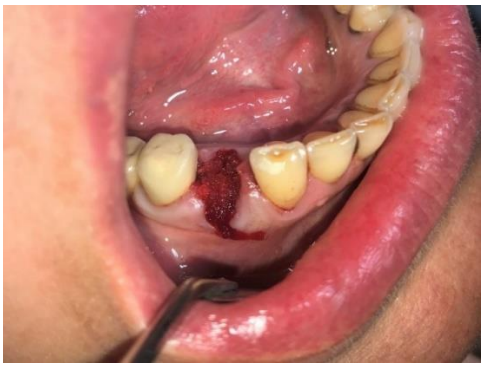

Figure 2. Placing a gelatin hemostatic sponge.

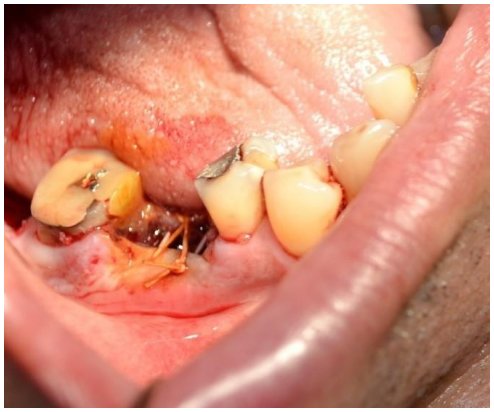

Figure 3. Situational suture of the extraction wound.

Clinical assessment of bleeding

Bleeding was assessed at 10 and 30 minutes, and 24 hours after extraction. Presence of a fresh clot or oozing at probe touch was considered as positive bleeding **(Figure 4A, B)**.

Patients were given detailed instructions regarding the way they should deal with the clot postoperatively. The anticoagulant therapy was resumed one day after extraction.

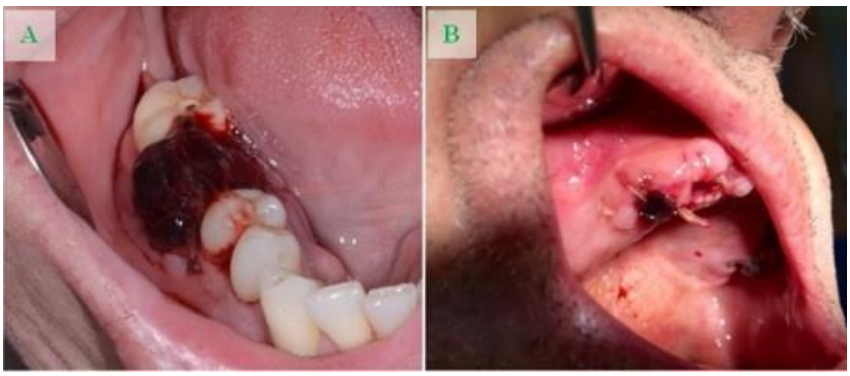

Figure 4. A. Positive bleeding; **B.** A fresh clot at 24 hours considered as positive bleeding.

RESULTS

The study included 30 patients (17 men and 13 women) aged between 61 and 83 years. Their blood pressure was controlled which was within the normal range at the time of surgery.

Depending on the number of extracted teeth and the level of surgical trauma, nine patients had grade 1 trauma, 11 patients had grade 2 trauma, and ten patients had grade 3.

Postoperative bleeding in the first 10 minutes was observed in 17 patients (56.66%). Within 30 minutes, bleeding was observed in 11 patients (36.66%). Two patients (6.66%) reported having only mild bleeding within 24 hours after extractions. No patient required additional haemostasis.

DISCUSSION

Oral surgery differs from other types of surgery when a typical tooth extraction is involved. It is due to the fact that the blood in this procedure comes from the capillaries and is unlikely to disrupt the integrity of large blood vessels. Moreover, the bleeding sites in oral surgery are easily accessible and local hemostatic agents are effective enough to control bleeding.

Taking into account the half-life of the anticoagulants we studied, we can conclude that discontinuation of the specific drug for the day of extraction is quite sufficient to prevent any adverse events. (7, 10)

The new oral anticoagulants do not require routine monitoring of their anticoagulant effect. In an emergency, the thrombin clotting time test and the ecarin clotting time test are the two most sensitive tests to measure the rate of anticoagulation. The activated partial thromboplastin time (aPTT) is less sensitive, but can also be used in cases of emergency. (11-13)

There are a variety of protocols regarding the antithrombotic therapy in general and an elective tooth extraction has been proposed in the literature. The differences between these protocols are a result of the early reports for abundant bleeding after tooth extraction. In our study, however, the post-extraction bleeding we observed did not differ from an ordinary bleeding in such cases.

CONCLUSIONS

If tooth extraction is required for patients on one of the new oral anticoagulants rivaroxaban (Xarelto), apixaban (Eliquis) or dabigatran (Pradaxa), the drug can be discontinued only for the day of extraction. This makes the work of oral surgeons easier saving time and lab work for the patient.

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