

Dental procedures in patients receiving oral anticoagulant therapy

Gaćina, Petar; Čaržavec, Dubravka; Stančić, Vladimir; Pejša, Vlatko

Source / Izvornik: **Acta clinica Croatica, 2006, 45, 101 - 104**

Journal article, Published version

Rad u časopisu, Objavljena verzija rada (izdavačev PDF)

Permanent link / Trajna poveznica: <https://um.nsk.hr/um:nbn:hr:220:975117>

Rights / Prava: [Attribution-NonCommercial-NoDerivatives 4.0 International/Imenovanje-Nekomercijalno-Bez prerada 4.0 međunarodna](#)

Download date / Datum preuzimanja: **2025-01-10**



Repository / Repozitorij:

[Repository of the Sestre milosrdnice University Hospital Center - KBCSM Repository](#)

DENTAL PROCEDURES IN PATIENTS RECEIVING ORAL ANTICOAGULANT THERAPY

Petar Gaćina¹, Dubravka Čaržavec¹, Vladimir Stančić¹ and Vlatko Pejša²

¹Department of Hematology, Sestre milosrdnice University Hospital; ²Department of Hematology, Dubrava University Hospital, Zagreb, Croatia

SUMMARY – There is a widespread belief among physicians and dentists that oral anticoagulant therapy must be discontinued before and for some time after dental procedures. This practice may increase the risk of potentially life-threatening thromboembolism. The present literature does not support routine discontinuation of anticoagulant therapy for dental patients. There is a theoretical risk of bleeding after dental surgery in patients at therapeutic levels of anticoagulation, however, it is minimal and may be greatly outweighed by the risk of thromboembolism upon anticoagulant therapy withdrawal. Thus, dental extractions can be performed without modification of oral anticoagulant therapy. In most patients local hemostasis with gelatin sponge, fibrin glue, sutures and/or mouthwash with tranexamic acid or ε-aminocaproic acid is sufficient to prevent postoperative bleeding.

Key words: *Anticoagulants – therapeutic use; Oral surgical procedures – adverse effects; Blood loss, surgical – prevention and control; Anticoagulants – contraindications; Thromboembolism – prevention and control; Oral hemorrhage – prevention and control*

Introduction

The purpose of this article is to suggest how patients receiving oral anticoagulant therapy should be managed when dental procedures (single and multiple simple extractions, gingival surgery and alveolar surgery) are performed. Anticoagulant therapy is used to reduce the risk of thromboembolic events in patients with atrial fibrillation, mechanical heart valves, recent pulmonary embolism, deep vein thrombosis and hypercoagulable states.

Oral Anticoagulants

Coumarins or vitamin K antagonists (VKAs) have been the mainstay of oral anticoagulant therapy for more than 50 years. Bleeding is the main complication of these drugs. Warfarin is the most common coumarin that is in clinical use. Its plasma half-life is about 37 hours¹ and

length of its effect 2-5 days². Its metabolism occurs mainly in the liver, involving cytochrome P450, CYP2C9 isoenzyme in particular³. Warfarin effect is reversible with vitamin K⁴.

The coagulation status of patients taking VKAs must be evaluated on the day of invasive dental procedure or, if it is not possible, on the day before. Prothrombin time (PT) which responds to a reduction in vitamin K-dependent factors, and international normalized ratio (INR) are used as a measure of anticoagulation. The World Health Organization recommends the use of INR as a more reliable laboratory test to assess patient anticoagulation status than PT. INR is expressed as the patient PT to control PT ratio. In an individual with normal PT, INR is approximately 1. An INR of 2 to 3 is the usual therapeutic range in deep vein thrombosis, and INR of up to 3.5 is required in patients with prosthetic heart valves⁵.

Warfarin and drug interactions

A number of drugs interact with warfarin by altering either protein binding or liver metabolism. The second-

Correspondence to: *Petar Gaćina, MD*, Department of Hematology, Sestre milosrdnice University Hospital, Vinogradska c. 29, HR-10000 Zagreb, Croatia

E-mail: petar.gacina@zg.htnet.hr

Received February 24, 2006, accepted March 31, 2006

and third-generation cephalosporins may augment the anticoagulation effect of warfarin by inhibiting cyclic interconversion of vitamin K^{6,7}. Acetylsalicylic acid (ASA)⁸, nonsteroidal anti-inflammatory drugs (NSAIDs)⁹ and penicillins in high doses^{10,11} increase the risk of warfarin-associated bleeding by inhibiting platelet function. Doses of salicylates of >1.5 g *per* day¹² and acetaminophen¹³ (paracetamol) may also augment the anticoagulant effect of warfarin, possibly by affecting the P450 cytochrome system (CYP2C9 enzyme). Cyclooxygenase inhibitors (rofecoxib and celecoxib) appear to have no major effect on platelets or INR¹. Treatments with fluconazole, itraconazole and miconazole resulted in bleeding in dental patients¹. Even topical miconazole gel potentiates warfarin anticoagulant activity¹⁴. Griseofulvin inhibits the anticoagulant effect of warfarin, whereas ketoconazole has no effect on hemostasis¹⁵. Some hypermetabolic states (fever, hyperthyroidism) increase warfarin responsiveness, probably by increasing the catabolism of vitamin K-dependent coagulation factors^{16,17}. Liver disease potentiates the response to warfarin through the impaired synthesis of coagulation factors.

Dental management and warfarin

Until recently it was standard practice to discontinue anticoagulant therapy before dental extractions or similar procedures. The discontinuation of warfarin exposes the patients, especially those with artificial heart valves, to the risk of thromboembolism¹⁸. In 542 documented cases in 493 patients exposed to anticoagulant therapy withdrawal specifically for dental procedures, five patients (1.0% of patients; 0.9% of cases) had serious embolic complications (including 4 deaths)¹⁹. There are no well-documented cases of serious bleeding problems after dental surgery in patients therapeutically anticoagulated with warfarin. A comprehensive review of more than 2014 dental surgical procedures (including more than 1964 dental extractions in 774 patients receiving continuous oral anticoagulant therapy) from 26 case reports and studies has revealed that in most cases no change in the intensity of anticoagulant therapy was needed¹⁹. These procedures included both single and multiple extractions, surgical extractions and alveolectomies. The risk of bleeding after dental surgery in patients on therapeutic levels of anticoagulation is minimal^{19,20}. The value of INR at therapeutic dose does not significantly influence the incidence of post-

operative bleeding^{21,22}. Local measures (Table 1) are important to protect the soft tissues and operative area, and to minimize the risk of bleeding. If there is the need to control local bleeding, inhibitors of fibrinolysis such as tranexamic acid mouthwash or *e*-aminocaproic acid mouthwash have been successfully used without anticoagulant therapy discontinuation^{23,24}. The efficacy of gelatin sponge²⁵, sutures²⁶ and fibrin glue^{27,28} has also been reported. Suturing is desirable to stabilize gum flaps and to prevent postoperative wound irritation by eating²⁹.

Table 1. Local measures to control bleeding after dental procedures in patients receiving oral anticoagulant therapy

Local pressure with gauze packs
Gelatin sponge
Fibrin glue
Sutures
Tranexamic or <i>e</i> -aminocaproic acid

Antiplatelet Drugs

ASA is the most widely used therapeutic agent in the prevention of vascular ischemic events. ASA irreversibly decreases platelet aggregation by inhibition of thromboxane A₂ (TXA₂). In patients receiving up to 100 mg ASA, there are no significant bleeding problems.

Adenosine diphosphate (ADP) receptor antagonists (clopidogrel and ticlopidine) are orally administered thienopyridine derivatives that inhibit platelet function by inhibiting the binding of ADP to one of its receptors^{30,31}. Neither clopidogrel nor ticlopidine prolong the bleeding time, and they have little effect on postoperative bleeding³². Patients taking these drugs may undergo invasive dental procedures without altering the dosage³³. If major oral surgery is planned and excessive bleeding is anticipated, clopidogrel should be discontinued for 7 days prior to surgery³⁴.

Conclusion

Many physicians and dentists recommend interrupting continuous oral anticoagulant therapy for a few days before dental surgery to prevent bleeding. There are several documented cases of thromboembolic events, including deaths, in patients whose anticoagulant therapy was withdrawn for dental treatment. On the other hand, although theoretically possible, there are no well-

documented cases of serious bleeding complications after dental surgery in patients receiving oral anticoagulant therapy within therapeutic range.

Current data suggest that in patients on therapeutic levels of anticoagulation dental surgery can be safely managed without stopping or altering their anticoagulant therapy. The procedure should be done with as little trauma as possible and by minimizing the necessity of multiple extractions. Local hemostasis with tranexamic acid or ϵ -aminocaproic acid, gelatin sponge, fibrin glue and/or sutures appears to be sufficient if excessive post-operative bleeding occurs.

References

1. PARFITT K, ed. Martindale. The complete drug reference, 32nd ed. London: Pharmaceutical Press, 1999.
2. MAJERUS PW, BROZE GJ, MILETICH JP, *et al.* Anticoagulant, thrombolytic, and antiplatelet drugs. In: HARDMAN JG, LIMBIRD LE, eds. Goodman and Gilman's The pharmacological basis of therapeutics, 9th ed. New York: McGraw-Hill, 1996: 1347-51.
3. Boots Healthcare Australia. Coumadin. Australian product information. Sydney: Boots Healthcare Australia Pty Ltd, 26 July 2000.
4. DELOUGHERY TG. Hemostasis and thrombosis. Georgetown, TX: Landes Publishing, 1999.
5. HIRSH J, DALEN J, ANDERSON DR, *et al.* Oral anti-coagulants: mechanism of action, clinical effectiveness, and optimal therapeutic range. *Chest* 2001;119 (Suppl):8S-21S.
6. BECHTOLD H, ANDRASSY K, JAHNCHEN E, *et al.* Evidence for impaired hepatic vitamin K1 metabolism in patients treated with N-methyl-thiotetrazole cephalosporins. *Thromb Haemost* 1984;51:358-61.
7. WEITKAMP M, ABER R. Prolonged bleeding times and bleeding diathesis associated with moxalactam administration. *JAMA* 1983;249:69-71.
8. DALE J, MYHRE E, LOEW D. Bleeding during acetylsalicylic acid and anticoagulant therapy in patients with reduced platelet reactivity after aortic valve replacement. *Am Heart J* 1980;99: 746-52.
9. SCHULMAN S, HENRIKSSON K. Interaction of ibuprofen and warfarin on primary haemostasis. *Br J Rheumatol* 1989; 38:46-9.
10. CAZENAVE JR, PACKHAM MA, GUCCIONE MA, *et al.* Effects of penicillin G on platelet aggregation, release and adherence to collagen. *Proc Soc Exp Biol Med* 1973;142:159-66.
11. BROWN CH, NATELSON EA, BRADSHAW MW, *et al.* The hemostatic defect produced by carbencillin. *N Engl J Med* 1974;291:265-70.
12. ROTHSCHILD BM. Hematological perturbations associated with salicylate. *Clin Pharmacol Ther* 1979; 26:145-52.
13. HYLEK EM, HEIMAN H, SKATES SJ, *et al.* Acetaminophen and other risk factors for excessive warfarin anticoagulation. *JAMA* 1998;279:657-62.
14. SILINGARDI M, GHIRARDUZZI A, TINCANI E, IORIO A, IORI I. Miconazole oral gel potentiates warfarin anticoagulant activity. *Thromb Haemost* 2000;83:794-5.
15. ANSELL J, HIRSH J, POLLER L, BUSSEY H, JACOBSON A, HYLEK E. The pharmacology and management of the vitamin K antagonists. *Chest* 2004;126:204S-33.
16. OWENS JC, NEELY WB, OWEN WR. Effect of sodium dextro-thyroxine in patients receiving anticoagulants. *N Engl J Med* 1962;249:76-9.
17. RICHARDS RK. Influence of fever upon the action of 3,3-methylene bis-(4-hydroxycoumarin). *Science* 1943;97:313-6.
18. OGIUCHI H, ANDO T, TANAKA M, *et al.* Clinical reports on dental extraction from patients undergoing oral anticoagulant therapy. *Bull Tokyo Dent Coll* 1985;26:205.
19. WAHL MJ. Dental surgery in anticoagulated patients. *Arch Intern Med* 1998;158:1610-6.
20. WAHL MJ. Myths of dental surgery in patients receiving anti-coagulant therapy. *J Am Dent Assoc* 2000;131:77-81.
21. BLINDER D, MANOR Y, MARTINOWITZ U, *et al.* Dental extractions in patients maintained on oral anticoagulant therapy: comparison of INR value with occurrence of postoperative bleeding. *Int J Oral Maxillofac Surg* 2001;30:518-21.
22. VICENTE BARRERO M, KNEZEVIC M, TAPIA M, *et al.* Oral surgery in patients undergoing oral anticoagulant therapy. *Med Oral* 2002;7:63-70.
23. SINDET-PEDERSEN S, RAMSTROM G, BERNVIL S, *et al.* Hemostatic effect of tranexamic mouthwash in anticoagulant-treated patients undergoing oral surgery. *N Engl J Med* 1989;324:840-3.
24. SOUTO JC, OLIVER A, ZUAZU-JAUSORO I, *et al.* Oral surgery in anticoagulated patients without reducing the dose of oral anticoagulant: a prospective randomized study. *J Oral Maxillofac Surg* 1996;54:27-32.
25. BLINDER D, MARTINOWITZ U, ARDEKIAN L, PELEG M, TAICHER S. Oral surgical procedures in patients on anticoagulant therapy. *Harefuah* 1996;130:681-3.
26. BLINDER D, MANOR Y, MARTINOWITZ U, TAICHER S, *et al.* Dental extractions in patients maintained on continued oral anticoagulant: comparison of local hemostatic modalities. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1999;88:137-40.
27. BODNER L, WEINSTEIN JM, BAUMGARTEN AK. Efficacy of fibrin sealant in patients on various levels of oral anticoagulant undergoing oral surgery. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998;86:421-4.
28. RAKOCZ M, MAZAR A, VARON D, SPIERER S, BLINDER D, MARTINOWITZ U. Dental extractions in patients with bleeding disorders. The use of fibrin glue. *Oral Surg Oral Med Oral Pathol* 1993;75:280-2.
29. SCULLY C, WOLFF A. Oral surgery in patients on oral anti-coagulant therapy. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2002;94:57-64.

30. SHARIS PJ, CANNON CP, LOSCALZO J. The antiplatelet effects of ticlopidine and clopidogrel. *Ann Intern Med* 1998; 129:394-405.
31. COUKELL AJ, MARKHAM A. Clopidogrel. *Drugs* 1997;54: 745-50; Discussion 751.
32. SCULLY C, CAWSON RA. Medical problems in dentistry, 4th ed. Oxford, London, Boston: Wright, Butterworth-Heinemann, 1997.
33. LITTLE JW, MILLER CS, HENRY RG, McINTOSH BA. Antithrombotic agents: implications in dentistry. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2002;93:544-51.
34. Clinical pharmacology: clopidogrel. In: *Clinical pharmacology* 2000. Tampa, FL: Gold Standard Multimedia, Inc., 2000.

Sažetak

STOMATOLOŠKI ZAHVATI U BOLESNIKA LIJEČENIH PROTUZGRUŠAVAJUĆOM TERAPIJOM

P. Gaćina, D. Čaržavec, V. Stančić i V. Pejša

Prošireno je mišljenje među liječnicima i stomatolozima da se oralna protuzgrušavajuća terapija mora prekinuti prije i kroz neko vrijeme nakon stomatoloških zahvata. Ova navika može povećati rizik od moguće za život ugrožavajuće tromboembolije. Sadašnja literatura ne podupire rutinski prekid protuzgrušavajuće terapije u stomatoloških bolesnika. U bolesnika na protuzgrušavajućoj terapiji u terapijskim vrijednostima nakon zubnog zahvata teorijski postoji minimalan rizik od krvarenja, dok prekidom protuzgrušavajuće terapije rizik može biti znatno veći zbog moguće tromboembolije. Stoga se vađenje zuba može izvesti bez promjene protuzgrušavajuće terapije. U većine bolesnika je lokalna hemostaza želatinoznom spužvom, fibrinskim ljepilom, šavovima i/ili ispiranje usne šupljine traneksamičnom ili epsilon amino kaproičnom kiselinom dostatno da spriječi poslijeoperacijsko krvarenje.

Ključne riječi: Antikoagulansi – terapijska primjena; Stomatološki zahvati – štetni učinci; Gubitak krvi, kirurški – prevencija i kontrola; Antikoagulansi – kontraindikacije; Tromboembolija – prevencija i kontrola; Oralno krvarenje – prevencija i kontrola