

# MYTHS OF DENTAL SURGERY IN PATIENTS RECEIVING ANTICOAGULANT THERAPY

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## ABSTRACT

**Background.** Continuous anticoagulant therapy with warfarin is administered to prevent a variety of medical complications, including thromboembolisms and stroke. When patients receiving continuous anticoagulant therapy are scheduled for dental surgery, a decision must be made whether to continue or interrupt the anticoagulant therapy.

**Methods.** The author reviewed the literature, focusing on dental surgery in patients receiving continuous anticoagulant therapy and in patients whose anticoagulant therapy was withdrawn before they underwent dental procedures.

**Results.** Of more than 950 patients receiving continuous anticoagulant therapy (including many whose anticoagulation levels were well above currently recommended therapeutic levels) who underwent more than 2,400 surgical procedures, only 12 (< 1.3 percent) required more than local measures to control hemorrhage. Only three of these patients (< 0.31 percent) had anticoagulation levels within or below currently recommended therapeutic levels. Of

526 patients who experienced 575 interruptions of continuous anticoagulant therapy, five (0.95 percent) suffered serious embolic complications; four of these patients died.

**Conclusions.** Serious embolic complications, including death, were three times more likely to occur in patients whose anticoagulant therapy was interrupted than were bleeding complications in patients whose anticoagulant therapy was continued (and whose anticoagulation levels were within or below therapeutic levels). Interrupting therapeutic levels of continuous anticoagulation for dental surgery is not based on scientific fact, but seems to be based on its own mythology.

**Clinical Implications.** Dentists should recommend that therapeutic levels of anticoagulation be continued for patients undergoing dental surgery. Practitioners should consult with the patient's physician if necessary to determine his or her level of anticoagulation before performing dental surgery.

**P**atients with a variety of medical conditions often receive continuous anticoagulant therapy with a vitamin K antagonist such as warfarin sodium (Coumadin, DuPont Pharma) to prevent complications from atrial fibrillation, thromboembolisms or stroke. Although continuous anticoagulant therapy can be lifesaving, it also can put patients at greater risk of experiencing hemorrhage after dental surgery. Therefore, a decision must be made whether to interrupt or continue anticoagulant treatment in patients undergoing various dental procedures.

## INTERNATIONAL NORMALIZED RATIO

Therapeutic levels of warfarin are measured by the international normalized ratio, or INR, or prothrombin time ratio, or PTR (the higher the INR or PTR, the greater the anticoagulant effect).<sup>1</sup> In 1992, the American College of Chest Physicians reported that its recommended therapeutic range of continuous anticoagulant is an INR between 2.0 and 3.0 for all conditions except artificial heart valves, for which the recommended INR is between 2.5 and 3.5.<sup>2</sup> This statement has been

endorsed by the American Heart Association.<sup>3</sup> Cannegieter and colleagues<sup>4</sup> reported that the INR for patients with artificial heart valves should not exceed 4.0.

Therefore, dental professionals should keep in mind that the highest therapeutic level of continuous anticoagulation is an INR of 4.0, which is equal to a PTR of no more than 2.2. Patients receiving continuous anticoagulant therapy usually undergo periodic monitoring, generally from once every other week to once every other month. Some well-informed patients will know their recent INRs or PTRs. The majority of patients, however, will not know these values, and the dental practitioner may need to contact the laboratories or the patients' physicians to obtain this information.

Although nonsurgical dental procedures do not present a significant risk of hemorrhage,<sup>5-8</sup> many people believe that continuous anticoagulant therapy should be withdrawn until anticoagulation levels are normal or near normal before surgical dental procedures (such as extractions, gingival surgery or alveolar surgery) are performed.<sup>6,9-15</sup> In a 1996 survey of physicians, Wahl and Howell<sup>16</sup> found that more than 70 percent of respondents recommended interrupting continuous anticoagulant therapy for at least some dental procedures. Since warfarin, the most widely used anticoagulant, has a half-life of about 36 hours, it is usually withdrawn for two days before surgery so that coagulation can return to nearly normal levels; therapy then is resumed as soon as possible after surgery.

Some practitioners who advocate withdrawal of warfarin therapy recommend considering administration of intravenous heparin to replace warfarin, but heparin has been shown to have a cost/benefit ratio<sup>17</sup> that is prohibitive and creates the logistical problem of separate physician visits before each dental appointment. The decision to withdraw continuous anticoagulant therapy is not based on scientific evidence; rather, it seems to be based on its own mythology.

#### FIVE MYTHS

**Myth 1.** The first myth is that there are many documented cases of serious bleeding problems resulting from dental surgery in patients receiving therapeutic levels of continuous anticoagulation.

More than 2,400 cases of dental surgical procedures (that is, extractions, alveolar surgery and gingival surgery) performed on more than 950 patients receiving continuous anticoagulant therapy have been documented.<sup>5,18-45</sup> Many of these cases involved full-mouth extractions and alveoplasties, and many were performed while patients' anticoagulation levels were higher than currently recommended therapeutic levels. Of these patients, only 12 (in 13 cases) experienced bleeding that was uncontrolled by local measures (such as application of pressure by biting on gauze or tea bags, suturing, placing oxidized cellulose, applying topical thrombin or using tranexamic acid mouthwashes).

In seven<sup>21,32,34,41,43,44</sup> of the 12 patients in whom bleeding was uncontrolled by local measures, the levels of anticoagulation were above currently recom-

mended therapeutic levels. In three of these patients, this may have been caused by the concomitant administration of antibiotics.<sup>21,41</sup> Antibiotics such as erythromycin and penicillin, especially when administered in multiple doses, may enhance warfarin's anticoagulant effect.<sup>21,41</sup> Two of the remaining five patients<sup>33,35</sup> who experienced hemorrhage had been rinsing with a placebo mouthwash several times a day immediately after their surgery, which might have dislodged the blood clot, thereby causing the bleeding. Vitamin K was administered to the remaining three patients, but the author<sup>30</sup> did not report whether local measures were used first in an attempt to control the hemorrhage.

These published reports are almost unanimous in showing that dental surgery can be performed safely on patients receiving anticoagulant therapy, even those whose anticoagulation level is higher than currently recommended therapeutic levels. Of the 12 patients in whom systemic measures were needed to control hemorrhage, none was reported to have experienced serious harm.

**Myth 2.** The second myth is that no cases of serious embolic complications in patients whose warfarin therapy has been withdrawn for dental treatment have been documented.

Some dentists and physicians recommend withdrawing anticoagulant therapy for some<sup>6,9-15</sup> or even all<sup>16</sup> dental procedures. This seems to be based, at least in part, on the belief that the risk of complications from withdrawing therapy for a few days is remote. Unfortunately, the facts do not support this posi-

tion. My literature search revealed more than 500 reports of anticoagulant therapy's having been withdrawn for various types of dental procedures.<sup>7,18,22,24,26,37,39,42,43,46-53</sup> Al-

though most of these patients experienced no ill effects as a result of having anticoagulant therapy withdrawn, four patients experienced fatal embolic complications soon after anticoagulant therapy was withdrawn, and one patient experienced two nonfatal embolic complications.<sup>22,39,46,48,50</sup>

Although this is a small percentage of patients (about 1 percent), the outcomes were serious and need to be avoided. If dental practitioners realize that anticoagulants often are life-saving drugs and that bleeding after dental surgery is rarely life-threatening, it is clear that they should be reluctant to withdraw these drugs before dental surgery.

**Myth 3.** Another myth is that no authorities have recommended that dental extractions be performed on patients who are receiving anticoagulant treatment at or above therapeutic levels.

Although Catalano<sup>54</sup> described a single extraction as "a significant stress to the hemostatic mechanisms," dental surgery is quite different from other types of surgery. It is unlikely that major vessels will be encountered, and bleeding from the wound usually can be treated locally with the application of pressure (for example, the patient's biting on gauze), application of gelatin sponges or placement of sutures. Several authors<sup>5,55-57</sup> have stated that dental surgery can be performed with minimal risk of postoperative bleeding at, or

even above, currently recommended therapeutic levels of continuous anticoagulation.

**Myth 4.** The fourth myth is that patients receiving continuous anticoagulant therapy who undergo dental surgery experience more postoperative bleeding problems than do patients with normal coagulation.

Some practitioners believe that patients receiving anticoagulant therapy are more likely than patients whose coagulation is normal (that is, those who do not require anticoagulant therapy) to experience postoperative bleeding problems, but even patients whose coagulation is normal can have bleeding problems. Several studies have shown little or no difference in terms of blood loss after dental

***Although most patients experienced no ill effects as a result of having anticoagulant therapy withdrawn, four patients experienced fatal embolic complications and one patient experienced two nonfatal embolic complications.***

surgery between patients receiving anticoagulant therapy and patients whose coagulation is normal.<sup>20,28,32</sup>

**Myth 5.** The last myth is that there are sound legal reasons to interrupt warfarin therapy before surgical dental treatment.

Some practitioners believe that continuous anticoagulant

therapy should be interrupted to be cautious and prevent lawsuits. A physician or dentist can be sued for an unwanted outcome regardless of what the practitioner may have done (although the case will not proceed for long unless it has substance).<sup>58</sup> Data collected from 1985 to 1991 by the Physician Insurers Association of America showed the leading reason for lawsuits against physicians to be improper prescribing of medications.<sup>59</sup> Dentists' main concern should be treating their patients, not protecting themselves. Withdrawing continuous anticoagulant therapy before dental surgery without supporting scientific evidence, thus exposing patients to the unnecessary and life-threatening risk of thromboembolisms, is not being cautious. My analysis of the data demonstrates that it is safer to continue anticoagulant therapy during dental surgery than it is to withdraw it.

Some dentists believe that consulting with patients' physicians is the solution to the problem of what to do for patients receiving continuous anticoagulant therapy. However, many physicians do not understand dental procedures. It is not surprising that physicians more often recommend withdrawing anticoagulant therapy for patients about to undergo endodontic therapy than they do for patients about to undergo professional cleanings,<sup>16</sup> even though endodontic therapy presents a far lower risk of bleeding. A 1996 survey of physicians<sup>16</sup> showed that most recommended withdrawing anticoagulant therapy for at least some dental procedures. Therefore, when consulting with physicians, dentists should pro-

vide data that support continuation of anticoagulant therapy. If the physician insists on withdrawing anticoagulant therapy, the dentist should request that the physician manage that aspect of the patient's case. "Simply following a physician's order" is unlikely to be an effective legal defense if the dentist is charged with failure to exercise reasonable professional judgment.<sup>60</sup>

#### SUMMARY

■ Based on a review of the literature, I conclude that there is no need to withdraw continuous anticoagulant therapy for non-surgical or surgical dental procedures if the patient's anticoagulation level is within the currently recommended therapeutic range.

■ Dental practitioners should prescribe prophylactic or therapeutic antibiotics only when absolutely necessary for patients, particularly those receiving continuous anticoagulant therapy. Concomitantly administered antibiotics may interact with continuously administered anticoagulants, thus increasing patients' level of anticoagulation. This is especially true with multidose antibiotic therapy.

■ Practitioners should consult with the patient's physician if necessary to determine his or her most recent INR before dental surgery is performed; the INR should not exceed 4.0 or the PTR 2.2. If the patient's anticoagulation level exceeds the therapeutic range, the physician may recommend withdrawing the anticoagulant therapy or reducing the dosage until the level is within the therapeutic range so that dental surgery can proceed safely. Because physi-

cians probably are not familiar with many dental procedures and their associated bleeding risks, it is important for dentists to educate them and supply data that support the continuation of anticoagulant therapy.

■ Dentists have an obligation to their patients to advise continuation of therapeutic levels of anticoagulation, but if the patient and physician insist, then it should be the physician who withdraws the anticoagulant therapy and the dentist who performs the dentistry. Similarly, if more than local measures are required to control bleeding after dental surgery, the physician should administer treatments such as vitamin K.

■ Good surgical technique and appropriate local measures to control bleeding are important for all dental patients, especially those receiving continuous anticoagulant therapy. ■

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