

Risk of bleeding after dentoalveolar surgery in patients taking anticoagulants

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Abstract

To avoid increasing the risk of thromboembolic events, it is recommended that treatment with anticoagulants should be continued during dentoalveolar operations. We have evaluated the incidence of bleeding after dentoalveolar operations in a prospective study of 206 patients, 103 who were, and 103 who were not, taking anticoagulants. Seventy-one were taking thrombocyte aggregation inhibitors and 32 vitamin K antagonists. Patients were treated according to guidelines developed at the Academic Centre for Dentistry Amsterdam (ACTA), The Netherlands. The operations studied included surgical extraction (when the surgeon had to incise the gingiva before extraction), non-surgical extraction, apicectomy, and placement of implants. Patients were given standard postoperative care and those taking vitamin K antagonists used tranexamic acid mouthwash postoperatively.

No patient developed a severe bleed that required intervention. Seven patients (7%) taking anticoagulants developed mild postoperative bleeds. Patients taking vitamin K antagonists reported 3 episodes (9%) compared with 4 (6%) in the group taking thrombocyte aggregation inhibitors. Among patients not taking anticoagulants, two (2%) developed mild bleeding. The differences between the groups were not significant. All bleeding was controlled by the patients themselves with compression with gauze. We conclude that dentoalveolar surgery is safe in patients being treated with anticoagulants provided that the conditions described in the ACTA guidelines are met.

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Introduction

Oral anticoagulation is common, and has been proved to be effective in preventing thromboembolic events.^{1,2} The most commonly used agents are thrombocyte aggregation inhibitors (such as acetylsalicylic acid and clopidogrel) and vitamin K antagonists (such as warfarin, acenocoumarol, and fenprocoumon).

As patients increasingly tend to keep their natural dentition as they get older, dentoalveolar surgery is more often indicated for elderly people who are taking anticoagulants. Some health care providers still instruct all patients to

discontinue them before dentoalveolar surgery regardless of the individual thromboembolic risks. However, this can result in thromboembolic events (such as deep vein thrombosis and pulmonary embolism) that are worse than postoperative bleeding after dentoalveolar surgery.³

The Academic Centre for Dentistry Amsterdam (ACTA) in the Netherlands developed guidelines based on the publications of van Diermen et al.^{4–6} These guidelines recommend that anticoagulants should be continued during dentoalveolar surgery under well-described conditions.⁷ The guidelines are accepted by the professional organisation for dentists in the Netherlands (NMT) and the organisations charged with out-patient antithrombotic treatment, and are used by most Dutch oral health care professionals.

The guidelines make a distinction between the 2 types of anticoagulants. Patients using thrombocyte aggregation inhibitors can continue to take them during dentoalveolar

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Table 1
Characteristics of patients and distribution of types of procedure.

| | Anticoagulant (n = 103) | No anticoagulant (n = 103) | Total (n = 206) |
|---|-------------------------|----------------------------|-----------------|
| Sex | | | |
| Male/female | 75/28 | 68/35 | 143/63 |
| Mean age (years) at time of treatment (range) | 62 (23–86) | 56 (21–85) | 59 (21–86) |
| Surgical extractions (mild bleeding) | 48 (5) | 55 (1) | 103 (6) |
| Non-surgical extractions (mild bleeding) | 42 (2) | 37 (1) | 79 (3) |
| Apicectomies (mild bleeding) | 5 (0) | 4 (0) | 9 (0) |
| Placement of implants (mild bleeding) | 8 (0) | 7 (0) | 15 (0) |

surgery with no restrictions. In contrast, patients taking vitamin K antagonists can continue to take them only when specific conditions are met. The international normalised ratio (INR), measured within 24–72 h preoperatively, must be ≤ 3.5 . The dentoalveolar surgery should involve no more than 3 extractions at the same time, surgical removal of wisdom teeth, periodontal treatment, apicectomies, incision of an abscess, or the placement of a maximum of 3 implants. The operation must be as atraumatic as possible, the wound must be sutured after extraction, and the patient should leave the hospital with adequate instructions only once the bleeding has stopped. Finally, the patient should rinse the mouth with tranexamic acid 5% for 5 days postoperatively.⁷

In the present study we evaluated the ACTA guidelines to find out whether these procedures led to increased postoperative bleeding. We compared the incidence in patients taking anticoagulants with that in a group of patients who were not taking them.

Patients and methods

Subjects

The study group comprised 206 patients who were referred to the Department of Oral and Maxillofacial Surgery of the University Medical Center Groningen, the Netherlands, for dentoalveolar operations that met the ACTA guidelines – that is, with a maximum of 3 extractions, apicectomies, or placement of implants at the same time. The types of dentoalveolar surgery required were divided into 4 categories: surgical extractions, non-surgical extractions, apicectomies, and placement of implants. Extractions were defined as “surgical” when the surgeon had to incise the gingiva before extraction.

Of the 206 patients included, 103 were taking oral anticoagulants and 103 were not (control group). Patients on vitamin K antagonists were included if the INR measured within 72 h preoperatively was in the range 1.8–3.5. Patients taking thrombocyte aggregation inhibitors were included if they used only one drug.

Exclusion criteria were inherited or acquired coagulopathy. Patients in the control group were excluded if they used any other coagulation-altering medication. The study was conducted according to the Declaration of Helsinki, and informed consent was obtained from all participants.

Protocol of the study

Patients were treated according to the ACTA guideline. Before the procedure all patients were given a local anaesthetic (4% articaine with 1/100 000 epinephrine). The operation was as atraumatic as possible and the wound was sutured afterwards. After extraction, patients were instructed orally and in writing to apply compression with gauze for 30 min immediately postoperatively. They were not allowed to leave the hospital until the bleeding had stopped, and were instructed to call the department of oral and maxillofacial surgery if the bleeding did not stop after 30 min. The 32 patients who used vitamin K antagonists were instructed to rinse with 5% tranexamic acid 4 times daily for 5 days postoperatively.

Two types of postoperative bleeding were defined. If the patient came to the hospital because the bleeding could not be stopped at home, it was scored as severe. One week postoperatively, all patients were called by a research worker to ask if they had had any postoperative bleeding at home that was stopped by compression with gauze; such bleeding was scored as mild.

Statistical analysis

Data were analysed with the help of IBM SPSS Statistics for Windows (version 20.0, Armonk, NY, IBM Corp). Data are expressed as mean (SD). The significance of differences between continuous variables were assessed using Student's *t* test, and between dichotomous variables using the chi square or Fisher's exact test, as appropriate. Linear regression analysis was used to calculate the relation between the INR and mild bleeding. Probabilities of less than 0.05 were accepted as significant.

Results

Of the 206 patients included there were 143 men and 63 women, mean age 59 (range 21–86) years at the time of treatment. Table 1 summarises the patients' characteristics and the operations done. The difference between the sexes was not significant ($p = 0.29$), while the difference in mean age at the time of treatment was ($p < 0.01$). The most common procedures were surgical and non-surgical extractions, and all episodes of bleeding developed in these patients. There was

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