Fall Rounds Presentation

Evidence Based Dentistry Rounds
Pharmacology/Oral Medicine

Rounds Team

- Group Leader: Dr. Dix
- Specialty Leader: Dr. Khaled
- Project Team Leader: Benjamin Gosselin
- Project Team Participants:
  - D1: Jennifer Stamos
  - D2: Ahmad Founas
  - D3: Mourin Serour

Patient

- 72 year old
- Male
- Caucasian
- “I want implants”
- Complicated medical history

Medical History

- High blood pressure, feelings of depression, arthritis, vision problems
- Medications: Carvedilol, **COUMADIN**, Lisinopril, Tramadol, Primidone, Sertraline, Vit B12 & D3
- NKDA
- Previous surgeries: pyloric stenosis, tonsillectromy, appendectomy, finger/toe surgeries, defibrillator and veionous filter installation, gastric bypass, cataract surgery, **blood clot removal from leg**
- Medical consult sent to physician

Medical Consult

Physician's Answers:

Our mutual patient, Mr. [redacted] is interested in implant placement which will require bone grafting and extractions. His health history indicates previous prosthetic joint replacements, the insertion of a cardio-defribilator, and the prescription of Coumadin/Warfarin.

1. Does Mr. [redacted] require antibiotic premedication prior to implant placement and/or extractions? If so, could you please prescribe your recommended regime. Not required

2. Should Mr. [redacted] alter his coumadin regime prior to implant placement and/or extractions? Additionally, should an INR reading be conducted prior to these procedures? Hold Coumadin 5 days prior

Please respond to these questions specifically and return response via an offical Ascension letterhead.

Thank you for your time.

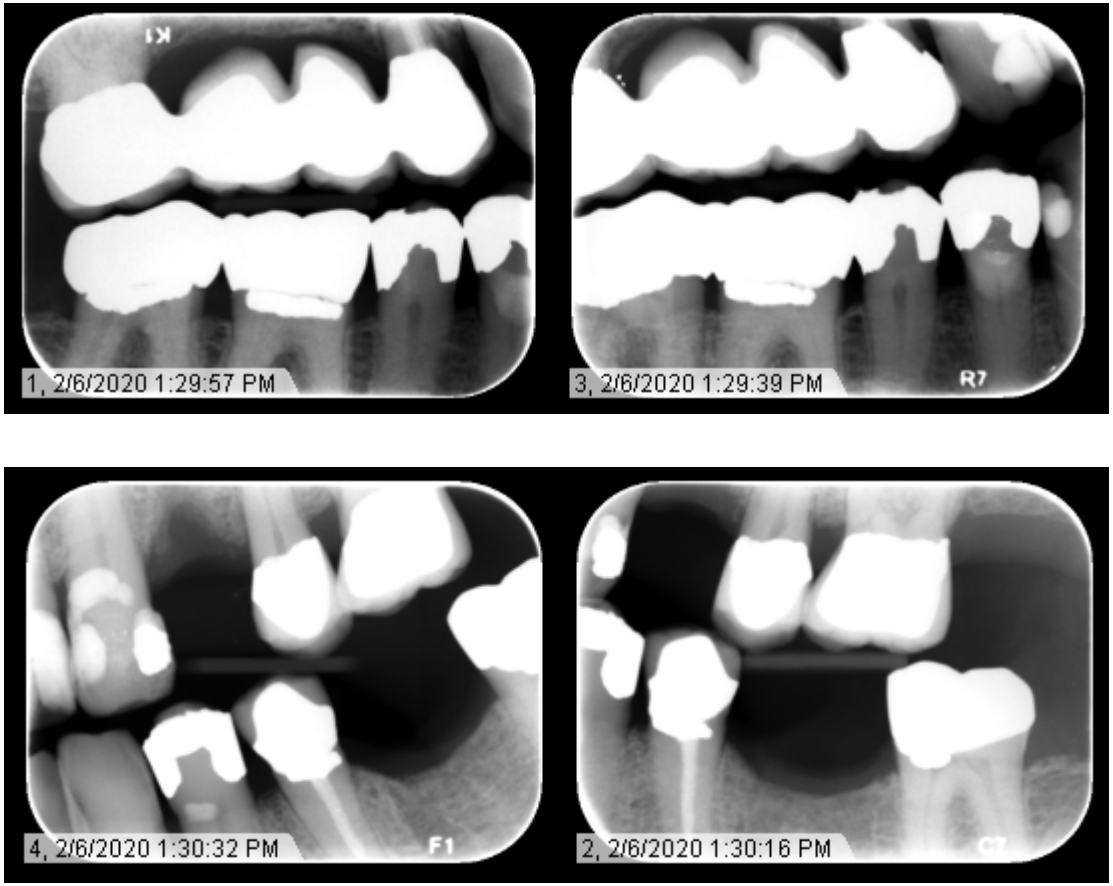
No INR needed

Dental History

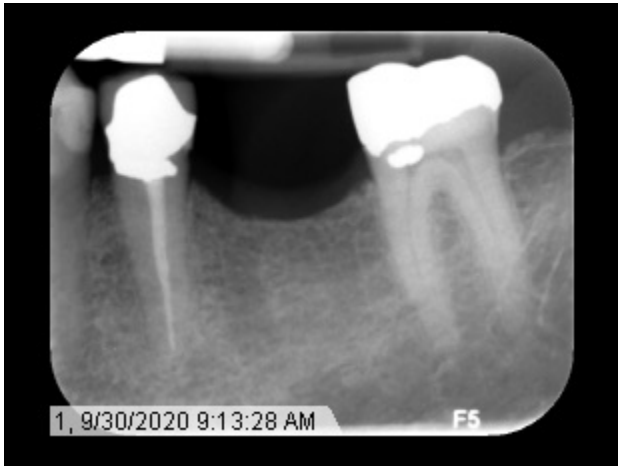
- Hx of Ext: #1, 2, 3, 15, 16, 17, 19, 32
- Bridge #2-5
- Restorations #6-11, #21-29
- RCT #5, #20
- PFM #13, #14, #20
- FCC #18, #30, #31
- Uses Prevident 1x daily and Chlorhexidine 2x daily

Radiographs

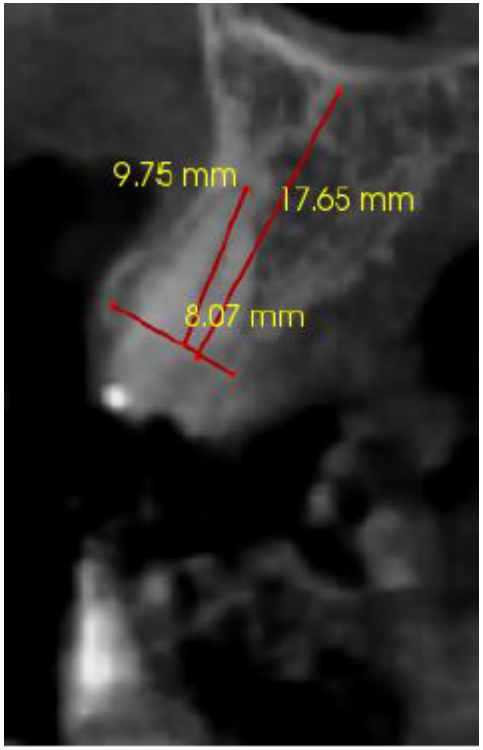
Radiographs

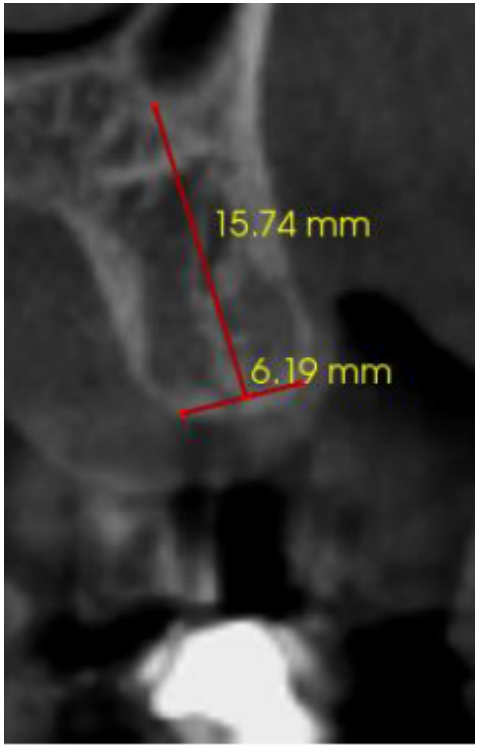


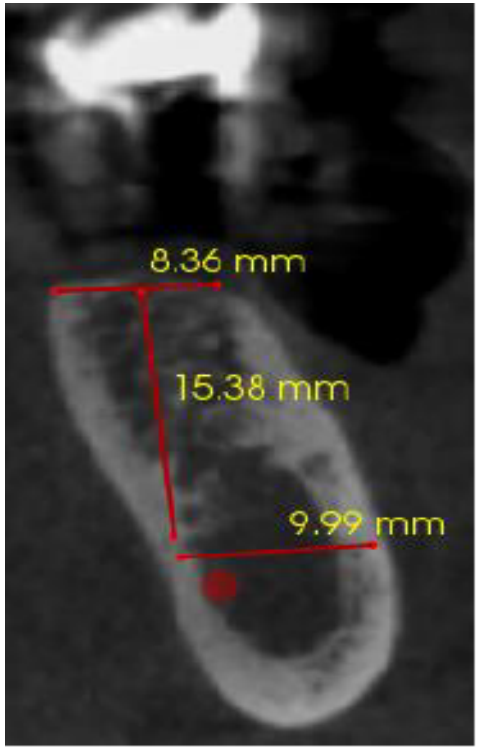
Radiographs



CBCT Images







Radiographic Findings

- Osseous remodeling complete At #19 and #12
- Root tip of #7 still present
- Radiolucency at apex of #8 is consistent with nasopalatine duct cyst or anatomic variant of nasopalatine canal
- Adequate space at all three implant sites

Clinical Photos

Clinical Photos

Clinical Photos

Periodontal Charting

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Problem List

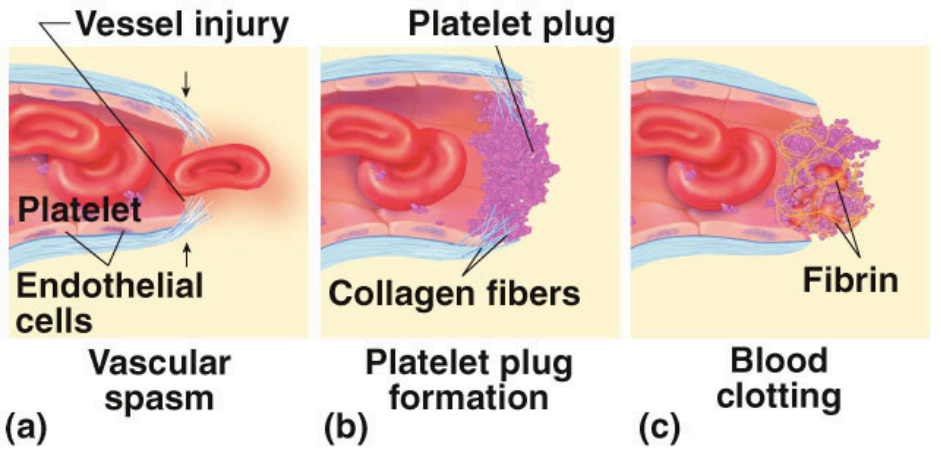
- Esthetics
- Fractured teeth
- Traumatic occlusion
- Missing teeth
- Tooth staining

D1 Basic Science

- ***What is the mechanism of action of Coumadin?***

Coagulation Cascade

- Hemostasis
  - Vascular spasm
  - Platelet plug formation
  - Coagulation phase
- 12 clotting factors produced by liver
  - Zymogens/proenzymes
- Common pathway
  - Intrinsic Pathway
  - Extrinsic Pathway



Coumadin (Warfarin)

- II, VII, IX, and X need to bind to Ca^{2+}
  - Proteins C and S also require vitamin K
- Vitamin K
- Vitamin K epoxide reductase (VKOR)

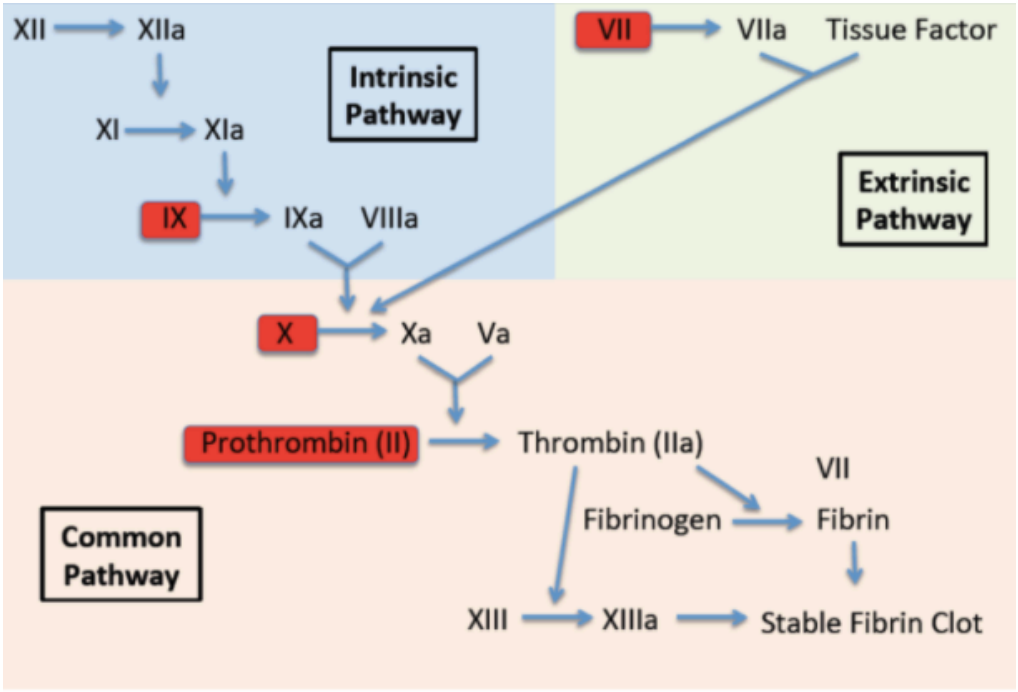


Figure 1: The coagulation cascade and sites of Warfarin inhibition. Adapted from Ferguson et al. (1998) (19).

References:
Implementation of a Computerized Decision Support System for Warfarin Dosing in Hemodialysis Patients: A Study of Effectiveness and Safety - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/The-coagulation-cascade-and-sites-of-Warfarin-inhibition-Adapted-from-Ferguson-et-al_fig1_295955649

Patel S, Singh R, Preuss CV, et al. Warfarin. [Updated 2020 Mar 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470313/?report=classic

D2 Pathology

- ***What are the potential consequences of performing invasive surgeries on a patient currently taking Coumadin?***

Risks

- Warfarin is a **blood thinner**
- Patients left with an **increased bleeding risk**
- Since patients usually have been taking it long term, **risk of thromboembolism** when they stop taking it

Actions of Dentist

- Patients typically stop taking 1-2 days before
  - Can resume day after surgery
  - Warfarin should be stopped 5 days before surgery
- Contact primary physician for INR
  - Usually surgery is safe if under 1.5
- Some dentists give tranexamic acid mouthwash to **control bleeding without stopping Warfarin**

D3 PICO

- **Clinical Question:**

What precautions need to be taken when treatment planning for a patient on Coumadin?

PICO Format

P: Medically Compromised Patients

I: Withholding Coumadin prior to surgery

C: Not-Withholding Coumadin prior to surgery

O: Well controlled surgical outcome

PICO Formatted Question

In medically compromised patients requiring invasive dental surgery does withholding Coumadin prior to surgery lead to a more controlled surgical outcome compared to continuous Coumadin use?

Clinical Bottom Line

It is the dentist responsibility to communicate with the physician to create an individualized treatment plan for medically compromised patients taking anticoagulant medication.

To avoid post-operative complication and maintain surgical success, its recommended that patient stop anticoagulant medications five days prior to implant placement to surgery

It's essential to measure INR pre and post dental implant surgery and for patients taking anticoagulant medication to assess the clinical diagnosis and modify treatment and medication if need.

Search Background

- **Date(s) of Search:** 09/14/2022,09/16/2022
- **Database(s) Used: Pubmed**
- **Search Strategy/Keywords:** Anticoagulant, warfarin, dental implant

Search Background

- **MESH terms used:**

Warfarin, anticoagulant treatment, medically compromised patients, invasive surgery, dental implant placement

Article 1 Citation, Introduction

- **Citation**: Madrid, Carlos, and Mariano Sanz. "What Influence Do Anticoagulants Have on Oral Implant Therapy? A Systematic Review." *Clinical Oral Implants Research*, vol. 20, 2009, pp. 96–106., doi:10.1111/j.1600-0501.2009.01770.x.
- **Study Design**: Systematic Review
- **Study Need / Purpose**: Examining and studying the consequences for anticoagulant therapy patients undergoing implant placement surgery.

Article 1 Synopsis: What Influence Do Anticoagulants Have on Oral Implant Therapy

- **Method:** The authors searched different references cited from articles published investigating the effects of anticoagulants. Many studies were found including controlled clinical trials, randomized control trails and case reports

- **Results:** According to the article, minimally invasive dental procedures including dental implant placement should not require interrupting anticoagulant medication.

  - Based on the study, "patients with INR of 3.5 or lower do not have stop their anticoagulant therapy for single implant placement, however for patients who have INR of 3.5 or higher anticoagulant medication dosage should be modified based on the physician decision." (Madrid, 2009).

Article1: What Influence Do Anticoagulants Have on Oral Implant Therapy?

- **Conclusions**: The article concludes that there is no significant difference of prolonged bleeding after implant surgery between patients withholding anticoagulant and not withholding it.
- Interrupting warfarin for patients undergoing minor dental surgery such as implant placement without bone graft is not necessary.

- **Limitations:** The study only looked at implant placement without considering bone graft Which is a common procedure for patients undergoing implant surgery. The study was

Article 1: What Influence Do Anticoagulants Have on Oral Implant Therapy

Reason for selection: High level of evidence and high relevance to clinical and PICO questions

Applicability to your patient: Examining the probability of complication of developing thrombosis or bleeding for anticoagulant patients going to get implant placement

Implications: Every case should have an individualized treatment plan based on patient needs and medical history

Article 2: Perioperative Management of Patients Who Are Receiving Warfarin Therapy

- **Citation**: Douketis, James D. "Perioperative Management of Patients Who Are Receiving Warfarin Therapy: an Evidence-Based and Practical Approach." *Blood*, vol. 117, no. 19, 2011, pp. 5044–5049., doi:10.1182/blood-2011-02-329979.
- **Study Design**: Clinical guidelines, systematic review
- **Study Need / Purpose**: The main aim for the study is to find appropriate answers to questions the authors has formulated. Questions including patient thrombosis and bleeding risk assessment, when anticoagulant therapy should be withheld, and if withheld when it should resume after surgery.

Article 2 Synopsis: Perioperative Management of Patients Who Are Receiving Warfarin Therapy

- **Method**: The study answered those questions directly referencing to many clinical guidelines and cohort studies.
  - In addition the article presented two cases to be investigated where patients are medically compromised one patient is going through a dental restoration and the other is undergoing colon resection surgery.

- **Results**: The study formulated a chart guiding dentists and physician when it's appropriate to stop warfarin medication.

  - the study indicates that one day before the therapy the INR should be measured. "If INR is higher than 1.5 vitamin k 1.0 to 2.0 mg should be administered orally" (Douketis, 2011)

Perioperative Management of Patients Who Are Receiving Warfarin Therapy

- **Conclusions**: For the patient who is going for a dental restorative procedure, patient is considered to have minimal thrombosis risk. As a result warfarin should not be interrupted and hemostatic agent could be used in case of bleeding.
  - For the second case where patient is going for a colon surgery, patient is required to stop warfarin for 5 days proper to surgery due to high risk of thrombosis
  - . Based on the article, the current guidelines is withholding warfarin 5 days prior to implant placement to achieve well controlled surgical outcome.

- **Limitations**: The study did not mention how the supporting evidence were collected and what type of literature is every study. The study only investigated restorative dental procedure and not implant placement or any other dental surgeries

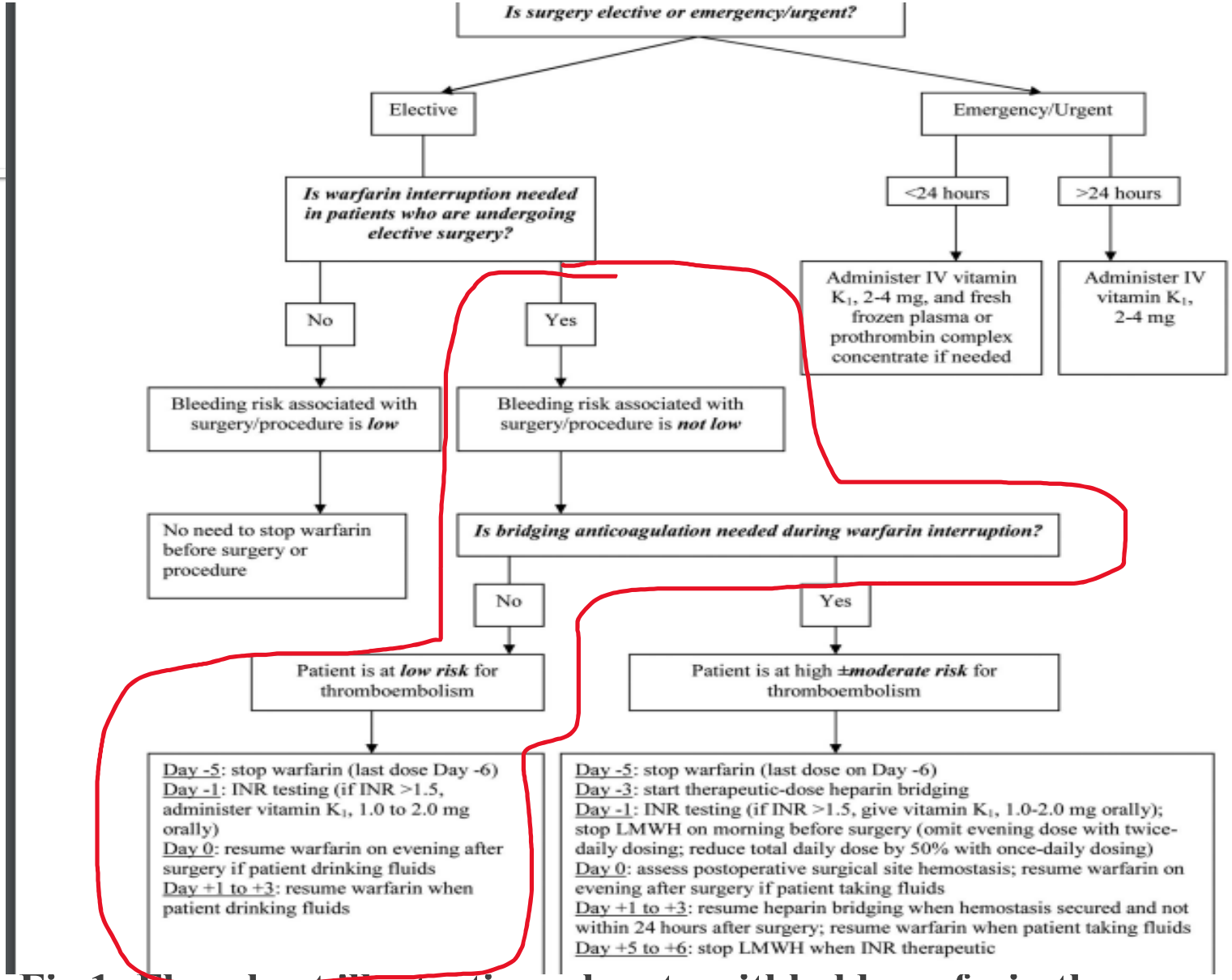


Fig 1: Flowchart illustrating when to withhold warfarin therapy.

Article 2 Selection: Perioperative

Management of Patients Who Are Receiving Warfarin Therapy

- **Reason for selection**: Directly related to the high level of evidence and supporting PICO question
- **Applicability to your patient**: Investigating when anticoagulant should be stopped and if stopped when it should continue
  Implications: withholding warfarin 5 days prior to surgery and continuing it right after surgery

Article 3 Citation, Introduction

- **Citation**: Bacci, Christian, et al. "Safety of Dental Implant Surgery in Patients Undergoing Anticoagulation Therapy: a Prospective Case-Control Study." *Clinical Oral Implants Research*, vol. 22, no. 2, 2010, pp. 151–156., doi:10.1111/j.1600-0501.2010.01963.x.
- **Study Design**: Case study
- **Study Need / Purpose**: The purpose of this study is to measuring the probability of bleeding as complication after implant placement surgery in patients who are on anticoagulant therapy

Article 3 Synopsis: Safety of Dental Implant Surgery in Patients Undergoing Anticoagulation Therapy

- **Methods**: 50 Patients who has been taken warfarin placed a single implant compared 109 healthy patients where have also went through implant placement.

- **Results**: Both groups showed two patients who experience prolonged postoperative bleeding. Patients bleeding were managed by using gauze placed on the implant site.

Safety of Dental Implant Surgery in Patients Undergoing Anticoagulation Therapy

- **Conclusions:** The study concluded that there's no significant different in determining bleeding risk for patient who are interrupting warfarin therapy versus continuing it during dental implant placement

- **Limitation**: the article did not mention the medical history of patients and how they were selected for the study. In addition, the article mentions that INR values were between "1.8-2.98" (Bacci, 2010).

Article 3 Selection: Safety of Dental Implant Surgery in Patients Undergoing Anticoagulation Therapy

Reason for selection: High relevance to clinical question investigating dental implant placement for patients who are on anticoagulant medication
Applicability to your patient: Examining the post complication of withholding warfarin versus not withholding it.
Implications: The study concluded that there's no significant different in determining bleeding risk for patient who are interrupting warfarin therapy versus continuing it during dental Implant placement

Levels of Evidence

- [x] **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)
- [ ] **1b** – Individual RCT
- [ ] **2a** – Systematic Review of Cohort Studies
- [ ] **2b** – Individual Cohort Study
- [ ] **3** – Cross-sectional Studies, Ecologic Studies, "Outcomes" Research
- [ ] **4a** – Systematic Review of Case Control Studies
- [ ] **4b** – Individual Case Control Study
- [x] **5** – Case Series, Case Reports
- [ ] **6** – Expert Opinion without explicit critical appraisal, Narrative Review
- [ ] **7** – Animal Research
- [ ] **8** – In Vitro Research

Strength of Recommendation Taxonomy (SORT)

☒	**A** – Consistent, good quality patient oriented evidence
☐	**B** – Inconsistent or limited quality patient oriented evidence
☐	**C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

Conclusions: D3

How does the evidence apply to this patient?

- Based on the literature, every patient should have an individualized treatment plan based on the medical and dental history.
- Patient will be having three implant placed one of which will be immediate placement after extraction and bone graft procedure. As a result, Dr. Khaled and Dr. Dix agrees with the Physician's decision witholding warfarin treatment before dental implant surgery for a better surgical control and outcome.

Based on the above considerations, how will you advise your D4?

Advise patient to withhold warfarin 5 days prior to surgery.

Conclusions: D4

- Based on the literature and the medical consultation with the patient's physician, the patient will be asked to refrain from taking Coumadin for the 5 days prior to implant surgery

Discussion Questions

Discussion Question		
Submitted by	**Submission Date**	**Discussion Question**
Nelson, Damien	09/15/2020	What are the indications for continued Warfarin use when dental surgery is indicated?
Schwartz, Lucas	09/23/2020	If the treatment requires the patient to stop using Coumadin, when is the recommended time to stop taking the drug?
Ajvazi, Ardita	09/25/2020	What is an acceptable range of INR prior to dental treatment?
Schlindwein, Margaret	09/27/2020	What dental procedures require the withholding of Coumadin?
Dolen, Madison	09/27/2020	Are there any drug interactions that are relevant to patients taking Warfarin?
Ciancio, Annamarie	09/28/2020	How many days prior to surgery do you need to remove the patient from Coumadin for it to have an effect?
Brady, Alexis	09/28/2020	If you discover during or after surgery that your patient is taking Coumadin, what steps will you need to take to ensure the patient stabilizes?
Cyriac, Ryan	10/01/2020	Are there any situations where the benefits of stopping Warfarin, even for a short period of time, do not outweigh the risks of a stroke or MI?
Kim, Jenny	10/01/2020	Are there any additional instructions that a clinician should provide to a patient who takes Warfarin after a dental procedure?
Mandel, Samantha	10/02/2020	What emergency treatments or medications should be on hand in the event that a patient is having trouble coagulating during a more invasive procedure?
Hatoum, Nadia	10/03/2020	How would you advise the patient if they are experiencing continued bleeding hours after postop?
Cednick, Lester	10/03/2020	Are there any specific dental procedures i.e restorations that would not be affected through the use of Warfarin or another drug acting as a blood thinner?
Kettering, Matthew	10/03/2020	Do these precautions need to be adjusted for patients taking a directacting anticoagulant?
Sarauer, Brady	10/04/2020	Are there any specific hemostatic agents that are better equipped to to combat perioperative bleeding with patients on Warfarin?
Hagmayer, Jacob	10/06/2020	With patients that stop taking warfarin due to invasive dental procedures, is there a certain time they are able to start taking warfarin again post treatment?

THANK YOU