TEMA 9: IMPLANTOLOGÍA EN PACIENTES MÉDICAMENTE COMPROMETIDOS (I)

Prof. Guillermo Machuca Portillo

¿HA DE SER SIEMPRE LA COLOCACIÓN DE IMPLANTE EL ÚNICO RECURSO ANTE LA PERIODONTITIS EXTREMA Y LA DESDENTACIÓN PARCIAL?

- UNA ACTUACIÓN MULTIDISPLINAR EN OCASIONES ES LA MEJOR OPCIÓN DE TRATAMIENTO PARA CONSEGUIR UNOS RESULTADOS ESTETICO-FUNCIONALES SATISFACTORIOS.

- LA COLABORACIÓN DEL PACIENTE ES ESENCIAL A LA HORA DE CONSEGUIR EL ÉXITO DEL TRATAMIENTO.

¿EXISTEN MUCHAS CONTRAINDICACIONES DE TIPO SISTÉMICO PARA LA COLOCACIÓN DE IMPLANTES?

- En contra de lo que pudiera parecer, hay pocas contraindicaciones documentadas
- Sin embargo, hay un buen número que incrementa el riesgo de fallos y complicaciones
- Por tanto, hay que valorar meticulosamente ventajas y desventajas, en cada caso
  - Coste-beneficio
  - Posibilidad de realizar el procedimiento meticulosamente
  - Posibilidad de mantener la higiene
  - Posibilidad de minimizar trauma, stress y hemorragia
- ¡PRUDENCIA!
  - Hacen falta estudios prospectivos sistemáticos

(Scully, Hobkirk & Diz, 2007)

¿EXISTEN MUCHAS CONTRAINDICACIONES DE TIPO SISTÉMICO PARA LA COLOCACIÓN DE IMPLANTES?

- Los estudios primitivos eran en pacientes sanos
- Pero en realidad, una buena parte se colocan en pacientes mayores con problemas médicos
- En los pocos estudios randomizados que existen no queda claro el riesgo que la salud incluye para el fallo de los implantes

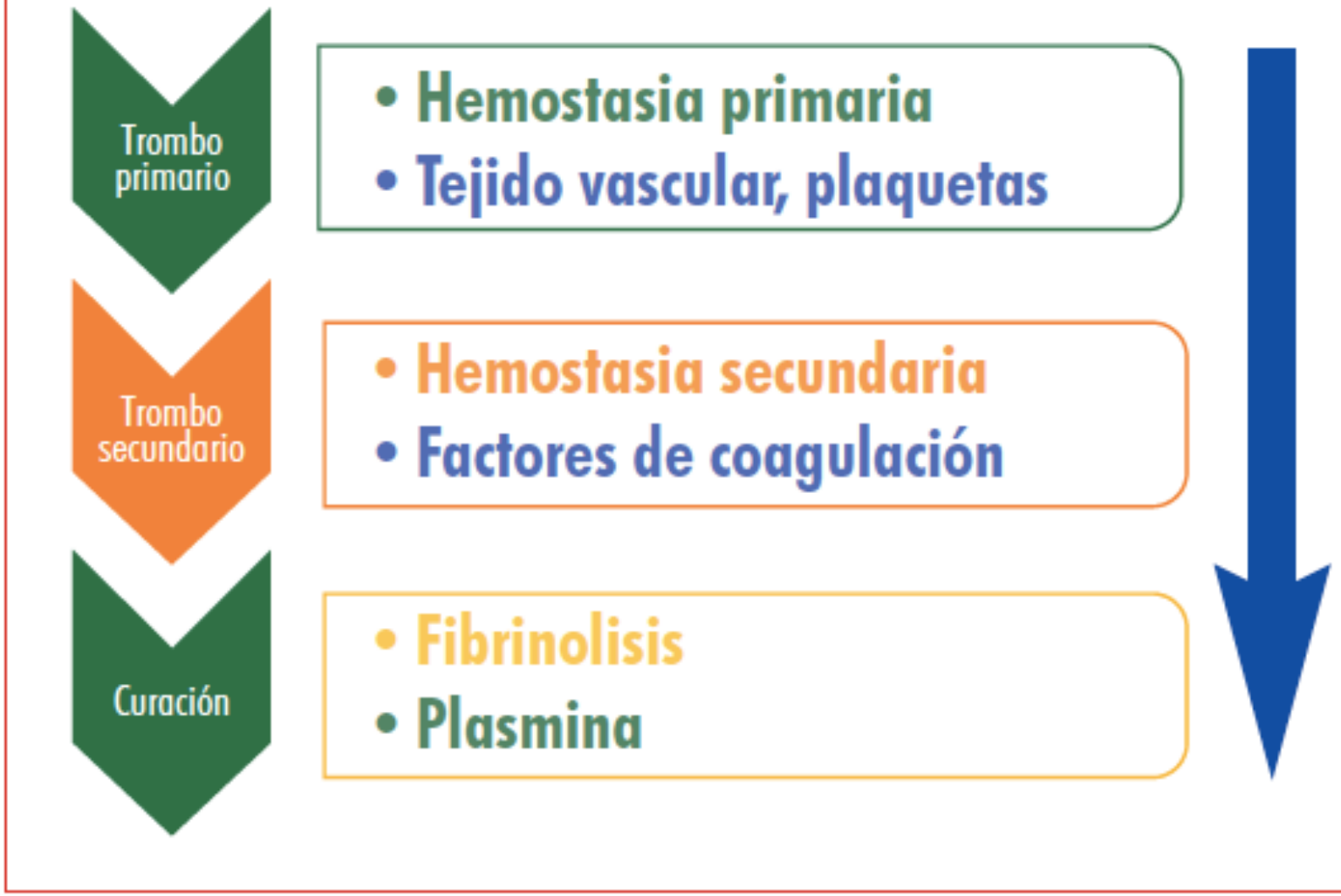
SITUACIONES CLÍNICAS SISTÉMICAS QUE POTENCIALMENTE PODRÍAN CONTRAINDICAR LA COLOCACIÓN DE IMPLANTES

- Alcoholismo
- Alteraciones de la coagulación
- Enfermedades óseas
- Enfermedades cardiacas
- Uso de corticosteroides
- Enfermedad de Crohn
- Diabetes
- Pacientes inmunocomprometidos
- Enfermedades mucosas
- Alteraciones neuro-psiquiátricas
- Pacientes oncológicos
- Síndrome de Sjögren
- Tabaco
- Envejecimiento

- No hay evidencia sobre si están contraindicados o no, pero el alcohólico…
  - Fuma mucho
  - Tiene otras alteraciones:
    - Osteoporosis
    - Inmunidad
    - Nutrición
    - Alteraciones hematológicas
    - Alteraciones psiquiátricas
- ¡Probablemente no sea un buen grupo de riesgo!

- No hay evidencia acerca de si es una contraindicación efectiva
- Hay ciertos aspectos que deberían considerarse meticulosamente:
  - El procedimiento quirúrgico nunca podrá favorecer la hemorragia
  - ¡Peligro de hemorragia en suelo de la boca y compresión de la vía aérea por migración de la hemorragia entre las fascias del cuello
  - El riesgo es menor que el de extraer 3 dientes, por lo que…
    - ¡INR por debajo de 3-3.5!
    - Cirugía no muy extensa
  - Eliminen fármacos que puedan interferir la coagulación o interaccionar con los anticoagulantes
- ¡Probablemente no sea un buen grupo de riesgo!

Figura 2. Fases de la hemostasia



TRASTORNOS DE LA FASE VASCULAR

Implantes en pacientes con trastornos en la fase vascular

Desarrollo conjunto de un granuloma piógeno y un hemangioma capilar sobre la cresta alveolar asociado con un implante dental: caso clínico

- Paciente implantada hace 5 años, consumidora de warfarina
- Se detecta masa gingival que crece progresivamente
- Analizan marcadores inmunohistoquímicos.
  - Causa: Irritación mecánica + warfarina
  - Retirada CRT y se recomienda revisión mucosa oral.

Kang et al. Journal of Medical Case Reports 2014, 8:192
http://www.jmedicalcasereports.com/content/8/1/192

JOURNAL OF MEDICAL CASE REPORTS

CASE REPORT Open Access

Co-development of pyogenic granuloma and capillary hemangioma on the alveolar ridge associated with a dental implant: a case report

Young-Hoon Kang[1], June-Ho Byun[1], Mun-Jeong Choi[1], Jong-Sil Lee[2], Jung-Hui Jang[3], Young-Il Kim[3] and Bong-Wook Park[1*]

Abstract

Introduction: The development of various benign oral mucosal lesions associated with dental implants, such as pyogenic granuloma or peripheral giant cell granuloma, has been rarely reported. However, the occurrence of vascular diseases, such as hemangioma, related to dental implants has not been explored in the literature. In this study, we report a case of co-development of pyogenic granuloma and capillary hemangioma on the alveolar ridge associated with a dental implant in a patient undergoing antithrombotic therapy. To the best of our knowledge, this is first case of hemangioma formation associated with a dental implant.

Case presentation: A 68-year-old Korean man was referred for intermittent bleeding and a dome-shaped overgrowing mass on his upper alveolar ridge. He underwent dental implantation 5 years ago, and was started on warfarin for cerebral infarction a year ago. He had experienced gum bleeding and gingival mass formation 6 months after warfarinization; then, his implant fixture was removed. However, his gingival mass has been gradually increasing. The gingival mass was surgically excised, and revealed the coexistence of pyogenic granuloma and capillary hemangioma in histological analysis of the specimen. The lesion has showed no recurrence for more than a year.

Conclusions: Regarding immunostaining features, the endothelial cell markers, CD34 and CD31, and the mesenchymal cell marker, vimentin, were strongly detected, but cell proliferation marker, Ki-67, was negatively expressed in the endothelial cells of the hemangioma portion. However, in the pyogenic granuloma portion, CD34 was almost negatively detected, whereas vimentin and Ki-67 were highly detected in the fibroblast-like tumor cells. According to these heterogeneous characteristics of the lesion, the patient was diagnosed with coexistence of pyogenic granuloma and capillary hemangioma associated with the dental implant on the attached gingiva. We recommend that patients with dental implants who have chronic peri-implantitis under antithrombotic therapy should be closely followed to ensure early detection of oral mucosal abnormalities.

Keywords: Antithrombotic therapy, Capillary hemangioma, Dental implant, Pyogenic granuloma

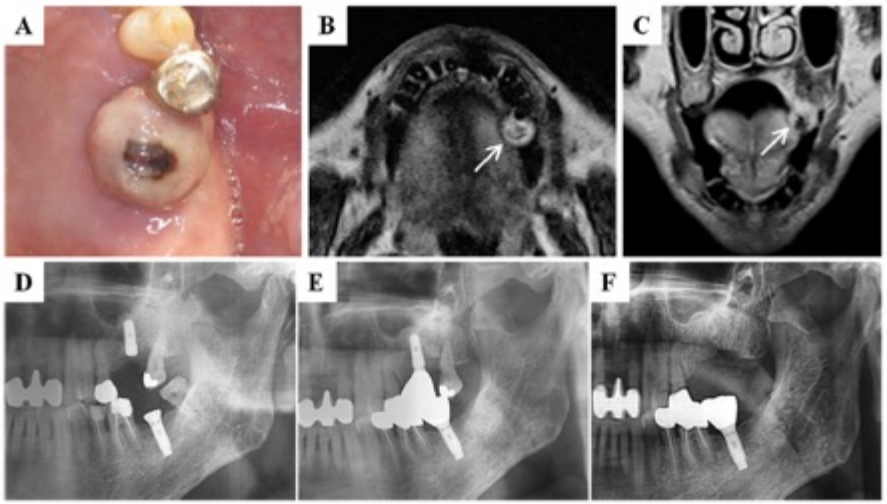


Figure 1 Preoperative clinical and magnetic resonance imaging views (A-C) and follow-up panoramic views for implantation (D-F). **(A)** A firm and round dome-shaped mass was observed in the site of the previous implant, the left maxillary first molar. **(B and C)** In magnetic resonance imaging, a 1.5cm heterogeneous mass was observed on the attached gingiva (arrows). **(D and E)** Panoramic views at 3 months **(D)** and 4 years **(E)** after fixture placement. **(E)** Progressive alveolar bone destruction due to peri-implantitis was observed at 4 years after implantation. **(F)** Panorama at the first visit to our clinic, 5 months after fixture removal. There is no associated bony defect with the gingival mass.

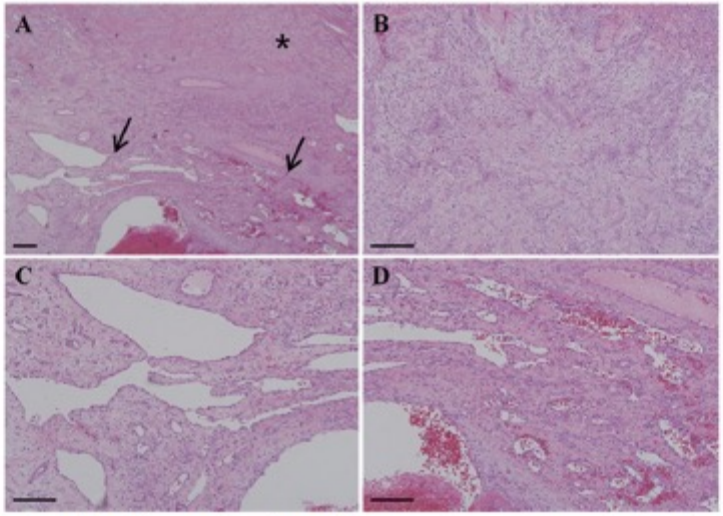


Figure 2 Hematoxylin and eosin staining features of specimen. **(A)** Tumor specimen at low magnification. Asterisk (*) indicates the pyogenic granuloma portion of the lesion, and arrows show the development of capillary hemangioma and thrombosis. **(B)** The pyogenic granuloma portion at higher magnification. Edematous granulation tissues and numerous small blood vessels with neutrophil infiltration were observed under the epithelium of the tumor. **(C and D)** Capillary hemangioma portion of the tumor at higher magnification showing numerous newly generated blood vessels filled with thrombi. Newly developed capillary vessels were seen to communicate with each other and lined with a thin endothelial cell layer. Scale bar = 200μm.

COAGULOPATÍAS ADQUIRIDAS

Implantes en pacientes antiagregados

INHIBIDORES DEL SISTEMA HEMOSTÁTICO

* ANTIAGREGANTES (medido por el tiempo de hemorragia):
  - Inhibidores de la síntesis de Tx
    - Aspirina
    - Triflusal
  - Inhibidores síntesis ADP
    - Tienopiridinas: Ticlopidina
    - Clopidogrel
  - Incrementadores de concentración de AMPc
    - Dipiridamol
  - Antagonistas de receptores de membrana
    - Abciximab
    - Prasugrel
    - Ticagrelor

*ANTICOAGULANTES:

- Potenciadores de antitrombina: heparina (TPTA)
- Inhibidores V-K (II, VII, IX, X): acenocumarol (Sintrom), warfarina (Aldocumar). V, VII, X (TP o INR)
- Nuevos anticoagulantes orales:
  - Inhibidores directos de la trombina: dabigatran
  - Anti Factor Xa: rivaroxaban, apixaban

* INDUCTORES DE LA LISIS DEL COÁGULO:

- Fibrinolisis: Estreptocinasa, urocinasa, prourocinasa

¿Incrementan los fármacos antiagregantes el riesgo de sangrado tras la cirugía de implantes?

- Estudio a boca partida
  - 2 Implantes en la zona posterior mandibular
  - 1 sin discontinuar clopidogrel (75 mg) o aspirina (80 mg)
  - 1 discontinuando 5 días clopidogrel o aspirina
- Se midieron:
  - Actividad plaquetaria
  - Severidad de sangrado
- CONCLUSIÓN: El consumo continuo de clopidrogrel o aspirina no altera el riesgo de hemorragia ni la pérdida de implantes

Do Antiplatelet Drugs Increase the Risk of Bleeding After Dental Implant Surgery? A Case-and-Crossover Study

Reza Tabrizi, DMD, Isa Khabeshi, MD,† Afshin Hoseinzadeh,‡ Babak Rezvanpour,§ and Shervin Shafie‖*

Purpose: Cessation versus continuation of antiplatelet drugs in patients undergoing dental implant surgery is a controversial issue. The present study evaluated postoperative bleeding during and after dental implant surgery in patients taking aspirin (ASA) or clopidogrel.

Material and Methods: The present study is a case-and-crossover study. Patients who were using antiplatelet drugs and receiving 2 bilateral dental implants in the posterior region of the mandible were studied. During session 1, dental implants were placed without stopping the intake of antiplatelet drugs. During session 2, antiplatelet drugs were stopped for 5 days. In group 1, platelet activity was measured by an assay based on flow cytometry and represented the platelet reactivity index. In group 2, platelet function analysis was used to monitor the antiplatelet effect of ASA. Bleeding severity was assessed using a visual analog scale for 72 hours after dental implant placement during sessions 1 and 2. Use of antiplatelet drugs was the predictive factor of the study and bleeding severity and platelet function were the outcomes of the study.

Results: Twenty-two patients composed group 1 (clopidogrel 75 mg) and 20 composed group 2 (ASA 80 mg). In group 1, bleeding severity was 4.86 ± 0.77 during session 1 and 4.59 ± 0.66 during session 2. Data analysis showed no difference in bleeding severity between sessions 1 and 2 in group 1 ($P = .72$). In group 2, bleeding severity was 4.05 ± 0.94 during session 1 and 3.9 ± 0.85 during session 2. There was no difference in bleeding severity between sessions 1 and 2 in patients taking ASA ($P = .19$).

Conclusion: The results suggest that continuing the intake of antiplatelet drugs did not increase bleeding after placement of dental implants.

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COAGULOPATÍAS ADQUIRIDAS

Implantes en pacientes anticoagulados

INHIBIDORES DEL SISTEMA HEMOSTÁTICO

* ANTIAGREGANTES (medido por el tiempo de hemorragia):
  - Inhibidores de la síntesis de Tx
    - Aspirina
    - Triflusal
  - Inhibidores síntesis ADP
    - Tienopiridinas: Ticlopidina
    - Clopidogrel
  - Incrementadores de concentración de AMPc
    - Dipiridamol
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- Nuevos anticoagulantes orales:
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  - Anti Factor Xa: rivaroxaban, apixaban

* INDUCTORES DE LA LISIS DEL COÁGULO:

- Fibrinolisis: Estreptocinasa, urocinasa, prourocinasa

ANTICOAGULANTES EN LA TERAPIA DE IMPLANTES? REVISIÓN SISTEMÁTICA

CONCLUSIONES.

- INR 2-4: Sin discontinuar no tienen hemorragia post-operatoria significativa
- INR 2-4: Hemostasia local útil.
  - Similitud de resultados distintos métodos
- Probablemente la discontinuación estaría indicada en grandes cirugías (senos, injertos, múltiples fijaciones,..)

Carlos Madrid
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What influence do anticoagulants have on oral implant therapy? A systematic review

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Conflicts of interest:
The authors declare no conflicts of interest.

Date:
Accepted 20 May 2009

Key words: anticoagulant therapy, bisphosphonates, coated implants, oral implants, osteonecrosis

Abstract

Objectives: This systematic review aims to assess the risks (both thromboembolic and bleeding) of an oral anticoagulation therapy (OAT) patient undergoing implant therapy and to provide a management protocol to patients under OAT undergoing implant therapy.

Material and methods: Medline, Cochrane Data Base of Systematic Reviews, the Cochrane Central Register of Controlled Trials and EMBASE (from 1980 to December 2008) were searched for English-language articles published between 1966 and 2008. This search was completed by a hand research accessing the references cited in all identified publications.

Results: Nineteen studies were identified reporting outcomes after oral surgery procedures (mostly dental extractions in patients on OAT following different management protocols and haemostatic therapies). Five studies were randomized-controlled trials (RCTs), 11 were controlled clinical trials (CCTs) and three were prospective case series. The OAT management strategies as well as the protocols during and after surgery were different. This heterogeneity prevented any possible data aggregation and synthesis. The results from these studies are very homogeneous, reporting minor bleeding in very few patients, without a significant difference between the OAT patients who continue with the vitamin K antagonists vs. the patients who stopped this medication before surgery. These post-operative bleeding events were controlled only with local haemostatic measures: tranexamic acid mouthwashes, gelatine sponges and cellulose gauzes's application were effective. Post-operative bleeding did not correlate with the international normalised ratio (INR) status. In none of the studies was a thromboembolic event reported.

Conclusions: OAT patients (INR 2–4) who do not discontinue the AC medication do not have a significantly higher risk of post-operative bleeding than non-OAT patients and they also do not have a higher risk of post-operative bleeding than OAT patients who discontinue the medication. In patients with OAT (INR 2–4) without discontinuation, topical haemostatic agents were effective in preventing post-operative bleeding. OAT discontinuation is not recommended for minor oral surgery, such as single tooth extraction or implant placement, provided that this does not involve autogenous bone grafts, extensive flaps or osteotomy preparations extending outside the bony envelope. Evidence does not support that dental implant placement in patients on OAT is contraindicated.

Seguridad de la cirugía de implantes en pacientes bajo tratamiento anticoagulante: un estudio prospectivo de casos-controles

- 50 pacientes en tratamiento con warfarina (INR > 1.8)
  - Control 109 pacientes sin anticoag.)
  - Implantes
  - Sin pauta sustitución
- N.S. entre grupos
- CONCLUSIÓN: Es un tratamiento que se puede llevar a cabo con hemostasia local, sin pauta de sustitución.

CLINICAL ORAL IMPLANTS RESEARCH

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Safety of dental implant surgery in patients undergoing anticoagulation therapy: a prospective case–control study

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Bacci C, Berengo M, Favero L, Zanon E. Safety of dental implant surgery in patients undergoing anticoagulation therapy: a prospective case–control study.
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Key words: anticoagulant, bleeding, endosseous dental implants, INR, warfarin therapy

Abstract

Objectives: Several studies have described oral surgical procedures in patients receiving anticoagulant therapy, but no prospective studies on dental implant surgery during anticoagulant treatment are currently available, and only a limited number of case reports refer to endosseous dental implant treatment in these patients. In the setting of oral surgery, it has been suggested that anticoagulant treatment is not required when the International Normalized Ratio (INR) is <4 and local haemostatic measures are applied. The purpose of this preliminary study was to evaluate the incidence of bleeding complications following surgical implant therapy in a group of 50 consecutive patients receiving oral anticoagulant therapy (warfarin) without interruption or modifications to their therapy (group A).

Materials and methods: One hundred and nine otherwise healthy patients comparable for age, sex, extent and site of the implant surgical procedure formed the control group (group B). In both groups, a standard protocol of local haemostasis, including non-reabsorbable sutures and compressive gauzes soaked with tranexamic acid, was applied. Surgeons, blind to the group allocation, performed all the procedures in an outpatient setting.

Results: Two and three late-bleeding complications were reported in group A and group B, respectively, without significant difference in the bleeding risk (relative risk = 1.45; $P = 0.65$; 95% confidence interval 0.2506–8.4271). These complications were managed using a compressive gauze soaked with tranexamic acid at the site of the surgical wound.

Conclusion: According to our preliminary results, local haemostasis in dental implant surgery is able to prevent bleeding complications in patients on oral anticoagulants, allowing these surgical procedures to be performed on an outpatient basis.

Table 3. **Post-operative bleeding in patients in groups A and B**

	No bleeding	Mild bleeding	Moderate bleeding*	Onset	Severe bleeding
Patients on Anticoagulant Therapy	48	0	2	2 days after surgery	0
Control Patients	106	0	3	2 days after surgery	0

*Relative risk = 1.45; $P = 0.65$; 95% confidence interval 0.2506–8.4271.

Estudio clínico randomizado de la cicatrización perimplantaria en implantes con superficies hidrofílicas e hidrofóbicas en pacientes anticoagulados

- Comparar superficies SLA Vs. SLActive con diámetro 3.3 en anticoagulados con cumarínicos (INR 1,2-2,5)
- 80 implantes, 20 pacientes: Boca partida
- 1 año
- CONCLUSIONES: 100% supervivencia. Ambas opciones son razonables en implantes estrechos en anticoagulados

CLINICAL ORAL IMPLANTS RESEARCH

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Randomized clinical study of the peri-implant healing to hydrophilic and hydrophobic implant surfaces in patients receiving anticoagulants

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Key words: dental implant, implant stability, implant surface, oral anticoagulation therapy, titanium–zirconium

Abstract

Objectives: To compare the peri-implant bone healing between TiZr implants with hydrophilic SLActive and hydrophobic SLA implant surface in patients receiving anticoagulants, to assess the implant survival and success rate, as well as to evaluate whether small-diameter TiZr implants could be used in patients on OAT in order to avoid augmentation procedures.

Material and methods: A total of 80 small-diameter tissue-level TiZr implants with SLActive and SLA surfaces were placed in 20 anticoagulated patients, following the "split-mouth" study design. Implant stability was measured up to the third postoperative month by resonance frequency measurements (RFA). One-year implant survival and success rate were evaluated.

Results: After one year, 100% implant survival and success rate were observed. A significant decrease in ISQ comparing to baseline values was noted in the SLActive group from the first postoperative week, and in the SLA group, from the 3rd week after the surgery. In both groups, a statistically significant decline in ISQ was observed between second and third postoperative week. No significant differences in ISQ values between SLActive and SLA implants were noted, at any time point.

Conclusions: Titanium–zirconium small-diameter implants with SLActive and SLA surface predictably achieve and maintain adequate bone tissue integration in patients receiving anticoagulants. OAT appears to influence the bone healing events resulting in lower ISQ in the end of 3-month period in comparison with baseline values, although without compromising implant stability.

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    - Clopidogrel
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  - Anti Factor Xa: rivaroxaban, apixaban

* INDUCTORES DE LA LISIS DEL COÁGULO:

- Fibrinolisis: Estreptocinasa, urocinasa, prourocinasa

VALORACIÓN DE LA EFICACIA DE LOS NACOS

- Dabigatrán (Pradaxa): No valen ni INR ni TP. El TTPa sólo tiene valor cualitativo (¡cuidado por encima del 80%!). Antídoto Idarocizumab!!!
- Rivarixaban (Xarelto): No vale el INR. Sí valen el TP y el TTPa, con curvas calibradas. O el ”Heptest” (muy costoso)
- Apixaban (Eliquis): No vale el INR. Sí valen el TP y el TTPa, con curvas calibradas. O el ”Heptest” (muy costoso)

RIESGO DE ICTUS

Tabla 3. Estratificación del riesgo de sangrado (escala HAS-BLED)

FACTOR DE RIESGO	DESCRIPCIÓN	PUNTOS
H (hipertensión)	Hipertensión no controlada (presión arterial sistólica = 160 mm HG)	1
A (alteración de la función renal y hepática)	Insuficiencia renal o insuficiencia hepática	1 por patología (1 ó 2)
S (ataque)	Historia previa de ictus	1
B (sangrado)	Historia de sangrado, anemia o predisposición al sangrado	1
L (INR lábil)	INR inestable/alto o pobre (menos del 60% del tiempo dentro de rango terapéutico)	1
E (anciano)	Edad ≥65 años.	1
D (drogas y/o alcohol)	Medicamentos que afecten la hemostasia (ej.: AAS, copidogrel) y/o ingesta de = 8 bebidas alcoholicas a la semana	1 por cada uno (1 ó 2)
Puntuación máxima		9

0: Bajo riesgo. 1-2: Riesgo Medio 3: Riesgo alto

Una puntuación mayor o igual a 3 indica alto riesgo de sangrado, por lo que el paciente deberá tener vigilancia estrecha con cualquier tratamiento antiagregante o anticoagulante.

Tabla 2. Estratificación del riesgo de ictus (escala CHA_2DS_2-VAS_C)

CHA_2DS_2-VAS_C	CRITERIOS	PUNTOS
C (insuficiencia cardiaca congestiva)	ICC	1
H (hipertensión)	Hipertensión	1
A_2 (edad)	Edad >75	2
D (diabetes)	Diabetes mellitus	1
S_2 (ataque)	Antecedentes de embolia o AIT	2
V (enfermedad vascular)	Enfermedad vascular (IAM o periférica)	6
A (edad)	Edad 65 - 74 años	1
SC (sexo)	Sexo femenino	1
Puntuación máxima		9

0: Riesgo bajo. No se trata o se trata con antiagregantes.
1: Riesgo medio. Se trata con anticoagulantes orales.
Mayor o igual a 2: Riesgo alto. Se trata con anticoagulantes orales.

González Fernández-Tresguerres F., Álvarez Sirvent, A., Torres García-Denche, J., Fernández-Tresguerres Hernández-Gil, I. Nuevos anticoagulantes orales: repercusión odontológica. Cient. Dent. 2016; 13; 2: 139-148

Tabla 5. Protocolo de actuación en cirugía oral en función del riesgo de tromboembolismo (CHA_2DS_2-VAS_C) y de sangrado (HAS-BLED)

Riesgo trombótico (CHA_2-DS_2-VAS_C)	Riesgo hemorrágico (HAS-BLED)					
	ALTO (=3)		**MEDIO (1-2)**		**BAJO (0)**	
	Cirugía compleja	**Cirugía simple**	**Cirugía compleja**	**Cirugía simple**	**Cirugía compleja**	**Cirugía simple**
ALTO (=2)	Posponer la cirugía	Posponer la cirugía	Realizar la cirugía en el momento más tardío tras la última toma	Mantener el NACO	Mantener el NACO	Mantener el NACO
MEDIO (1)	Suspender 1 dosis del NACO	Suspender 1 dosis del NACO	Suspender 1 dosis del NACO	Aplazar la dosis diaria o realizar la cirugía en el momento más tardío tras la última toma	Aplazar la dosis diaria o realizar la cirugía en el momento más tardío tras la última toma	Mantener el NACO
BAJO (1)	Suspender 24 - 48 h.	Suspender 24 - 48 h.	Suspender 24 - 48 h.	Suspender 1 dosis del NACO	Suspender 1 dosis del NACO	Mantener el NACO

Riesgo de hemorragia postoperatoria en cirugía oral en anticoagulados orales : meta-análisis (2017)

- Selección final: 12 estudios
- CONLUSIONES:
  - Anticoagulados más riesgo de hemorragia en cirugía menor
  - Implantes: El estudio no encuentra un riesgo incrementado de hemorragia en los anticoagulados.
  - Los NACOS podrían ser más seguros.
  - Hacen falta MÁS ESTUDIOS

Post-operative Bleeding Risk in Dental Surgery for Patients on Oral Anticoagulant Therapy: A Meta-analysis of Observational Studies

*Quan Shi†, Juan Xu†, Tong Zhang, Bin Zhang and Hongchen Liu**

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Background and Objective: Minor dental surgery is invasive and hemorrhagic. Thus, in patients treated with anticoagulants, the bleeding risk related to these invasive procedures is concerning. The aim of this meta-analysis is to evaluate this risk by comparing the post-operative bleeding rates of oral anticoagulation treatment (OAT) patients (without interrupted or altered anticoagulant intake) with non-OAT patients.

Methods: PubMed, Embase and the Cochrane Library were searched for eligible studies that compared the post-operative (following minor dental surgery) bleeding rates of OAT patients without interrupted or altered therapy with those of non-OAT patients. Relative risk (RR) and 95% confidence interval (CI) were calculated. Subgroup analyses were used to identify the association between the bleeding rate and different dental surgeries or anticoagulants.

Results: Thirty two full text articles were assessed for eligibility and 20 studies were excluded according to the selection criteria. Finally, 12 studies and a total of 2102 OAT patients and 2271 non-OAT patients were included. A pooled analysis indicated that the post-operative bleeding risk in OAT patients is higher than that of non-OAT patients (RR: 2.794, 95% CI: 1.722–4.532, $P = 0.000$). The pooled RRs in the dental implant surgery and dental extraction subgroups were 2.136 (95% CI: 0.825–5.531, $P = 0.118$) and 2.003 (95% CI: 0.987–4.063, $P = 0.054$), respectively. As for the different oral anticoagulants, the pooled RR in the subgroup of new oral anticoagulants (NOACs) was 1.603 (95% CI: 0.430–5.980, $P = 0.482$), while the pooled RR in the vitamin K antagonists subgroup was 3.067 (95% CI: 1.838–5.118, $P = 0.000$).

Conclusion: Under current evidence, OAT patients were under a higher post-operative bleeding risk than the non-OAT patients following minor dental surgery. For the dental implant surgeries and dental extractions, our study failed to demonstrate a higher risk of bleeding in the OAT patients compared with the non-OAT patients. Besides, The NOACs might be safer than the vitamin K antagonists in dental implant surgery. However, more well-designed studies are required for future research.

Keywords: oral anticoagulants, dental surgery, post-operative hemorrhage, relative risk, patients, meta-analysis

TABLE 1 | Summary of the included studies.

Study ID	Study design	Dental surgery	Oral anticoagulant therapy	Follow up time	NOS score
Febbo A 2016	Retrospective	Dental extraction	Patients were treated with vitamin warfarin and INR less than 4	Day 1 to day 10	7
Gómez-Moreno G 2016b	Prospective	Dental implant surgery	Patients had been taking dabigatran for over 6 months (150 mg orally every 12 h).	Days 3, 8	8
Gómez-Moreno G 2016a	Prospective	Dental implant surgery	Patients had been treated with rivaroxaban for over 6 month	Days 3, 8	8
Clemm R 2016	Prospective	Dental implant surgery	Patients were treated with vitamin K inhibitors or direct oral anticoagulants.	Day 10	7
Bajkin BV 2015	Prospective	Dental extraction, apicectomy, etc.	Patients were treated with vitamin K antagonists and INR: 2.0–4.2	Days 1, 2, 5, 7	7
Broekema FI 2014	Prospective	Dental extraction, apicectomy, dental implant surgery	Patients were treated with vitamin K antagonists and INR: 1.8–3.5.	1 week	7
Eichhorn W 2012	Retrospective	Osteotomies, apicoectomies, extractions, etc.	Patients were treated with coumarins, INR : 1.2- 4.2	Days 1, 7, 10, 14	5
Karslı ED 2011	Prospective	Dental extraction	Patients on warfarin treatment without interruption, INR < 4.0	48 h	6
Bacci C 2011	Prospective	Dental implant surgery	INR: 1.8–2.98; warfarin therapy >6 months; normal hemoglobin value and platelet count	Days 3, 8	8
Bacci C 2010	Prospective	Dental extraction	Patients were treated with warfarin for at least 3 months, and the therapy was maintained unchanged. INR: 1.8–4	Days 3, 8	8
Zanon E 2003	Prospective	Dental extraction	Patients on warfarin without changed. INR: 1.8–4	Days 3, 8	7
Campbell JH 2000	Prospective	Extraction, alveoloplasty, intraoral soft tissue surgery	Patients continued their anticoagulant regimens. INR:1.2–2.9	Day 1	5

INR, international normalized ratio.

Anticoagulantes "directos" y sus implicaciones en Odontología. Revisión.

- 11 estudios seleccionados.
  - Sólo 3 con implantes
- CONCLUSIONES:
  - NACOS son seguros
  - Hemorragias solucionables con hemostasia local
  - Cambio a heparina innecesario
  - Es necesario establecer un consenso entre profesionales

Journal section: Odontostomatology for the disabled or special patients
Publication Types: Review

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Direct oral anticoagulants and its implications in dentistry. A review of literature

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Abstract

Background: Four novel direct oral anticoagulants (DOACs) named dabigatran, rivaroxaban, edoxaban and apixaban have been recently introduced to overcome some of the drawbacks of existing anticoagulants. They have less interactions and do not require routine monitoring. However, there is not enough scientific data about the protocol to apply in these patients on DOACs undergoing dental treatment. Thus is necessary to evaluate the potential bleeding risk of these drugs, the possibility of thromboembolic events occurring if they are withdrawn or the need to change to heparin previously.

Material and Methods: A comprehensive search of the PubMed, Scopus and ISI Web of Science databases was conducted to identify studies that evaluated the relationship between direct oral anticoagulants and dental procedures. The quality of the reported information was assessed following the PRISMA statement.

Results: Eleven studies that met the inclusion criteria were included in the review: 2 randomized clinical trials, 3 prospective studies, 3 retrospective studies, 2 case series and 1 case report.

Conclusions: DOACs are safe drugs in terms of bleeding. The possible postoperative bleeding complications are manageable with conventional haemostasis measurements. The bridging approach with heparin does not seem to be recommended. Consensus among the professionals involved in the management of the patient is fundamental in invasive dental treatments and in complex patients.

Key words: *Oral anticoagulants, DOAC, NOAC, dabigatran, rivaroxaban, apixaban, edoxaban, bleeding, oral surgery.*

Table 2: Studies included in the literature review.

Name	Type of study	N	Dental treatment	DOAC	Results
Healey *et al.* 2012 (10)	Randomized Clinical Trial	459	Dental procedures	Dabigatran	2.3% bleeding (1.9% dabigatran 110mg; 3.2% dabigatran 150mg, 4.8% warfarin)
Romond *et al.* 2013 (33)	Case Report	8	Dental extractions, alveoloplasty and tuberosity reduction	Dabigatran	minimal bleeding
Beyer-Westendorf *et al.* 2013 (37)	Prospective data registry	2100	Extraction and non extraction dental procedures	Rivaroxaban Dabigatran Apixaban	No evidence of increased bleeding More bleeding in heparin bridging
Breik *et al.* 2014 (5)	Case series	7	Simple or multiple dental extractions	Dabigatran	n= 1 (14.28%) minor postoperative bleeding n=1 (14.28%) severe postoperative bleeding
Garcia *et al.* 2014 (36)	Randomized Clinical Trial	1435	Dental extractions/oral surgery	Apixaban	No evidence of increased bleeding Perioperative bridging is not necessary
Gómez Moreno *et al.* 2015 (35)	Retrospective Study	43	Dental implants	Rivaroxaban	n=1/43 (2.32%) moderate bleeding
Hanken *et al.* 2015 (7)	Retrospective Study	52	Dental extractions and dental implants	Rivaroxaban	n=6/52 (11.5%)minimal bleeding
Abayon *et al.* 2016 (2)	Case series	25	Dental extractions, periodontal treatment, restorations	Rivaroxaban Apixaban	n= 10/25 (40%) clinical insignificant bleeding
Gómez Moreno *et al.* 2016 (34)	Retrospective study	67	Dental implants	Dabigatran	6.9% slight bleeding
Clemm *et al.* 2016 (38)	Prospective comparative study	564	Implant surgery and bone grafting	Dabigatran Rivaroxaban Apixaban	No evidence of increased bleeding
Mauprivez *et al.* 2016 (39)	Prospective observational study	73	Dental extractions	Dabigatran Rivaroxaban Apixaban	n= 7 (9.6%) minimal bleeding

N= expressed as dental procedures.

Manejo de pacientes anticoagulados en el tratamiento con implantes: estudio clínico comparativo

- Objetivo: Valorar el sangrado tras implantes y/o injerto óseo.
- M&M:564 pacientes
  - Control: No AC
  - NACOS
  - Inhib. V-K
  - Inhib. V-K + sust. Heparina
  - Antiagregados
- Resultados: 1.2% hemorragias:
  - 0.6% Control
  - 3.4% anticoag.
  - Inhib V-K: Más hemorragias
- CONCLUSIONES:
  - No discontinuen tratamientos
  - Apliquen métodos preventivos poco invasivos

CLINICAL ORAL IMPLANTS RESEARCH

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Management of anticoagulated patients in implant therapy: a clinical comparative study

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Key words: augmentation, bridging, dental implant, DOAC, anticoagulation therapy, new oral anticoagulants, oral anticoagulation, oral surgery, phenprocoumon, warfarin

Abstract

Objectives: This prospective clinical comparative study aimed to analyze the postoperative bleeding risk of patients continuing their anticoagulation therapy (AT) and undergoing implant surgery and bone grafting procedures.

Materials and methods: The treatments ranged from the insertion of single or multiple dental implants over implant exposures to sinus floor augmentation and vertical and/or lateral bone grafting with autologous bone grafts. The patients of the test groups (AT groups) were treated with platelet aggregation inhibitors (PAIs), Vitamin-K inhibitors, Vitamin-K inhibitor withdrawal bridged with heparin (LMWH), or new/direct oral anticoagulants (NOACs/DOACs). Patients of the control group were non-anticoagulated (non-AT group). Surgical procedures were performed in the same manner in all groups. Pre, intra, and postoperative data concerning the treatment, extent of the surgery and bleedings was recorded and statistically evaluated.

Results: There were seven postoperative bleedings in 564 patients (1.2%), four in the AT groups (3.4%), and three in the non-AT group (0.6%). No thromboembolic complication occurred in the whole observation period. The invasiveness of the surgical procedure had no statistically significant effect on bleeding frequencies. Patients taking Vitamin-K inhibitors had a significantly higher risk of a postoperative bleeding compared to patients without any AT ($P = 0.038$). Two patients were hospitalized due to the severity of the bleeding as a precautionary measure (one in the non-AT and one in the PAI group). All bleedings were easily controllable with local hemostatic measures. There was no postoperative bleeding recorded for patients taking DOACs.

Conclusions: Anticoagulation therapy should be continued in patients undergoing implant surgery and bone grafting procedures avoiding thromboembolic complications. Surgeons should always apply the most minimally invasive approach to reduce postoperative risks and be able to apply local hemostatic measures in terms of a bleeding complication.

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Clin. Oral Impl. Res. **27**, 2016, 1274–1282
doi: 10.1111/clr.12732

Cirugía de implantes en pacientes en tratamiento con rivaroxaban

- 57 con rivaroxaban Vs. 39 sanos
  - Sutura no reabsorbible
  - Gasa con tranexámico 5% 30-60 min.
- Sin diferencias sign. entre grupos.
- CONCLUIONES:
  - IMPLANTES + RIVAROXABAN: no modifiquen pauta + gasa con tranexámico.

CLINICAL ORAL IMPLANTS RESEARCH

Gerardo Gómez-Moreno
Antonio Aguilar-Salvatierra
Esther Fernández-Cejas
Rafael Arcesio Delgado-Ruiz
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Dental implant surgery in patients in treatment with the anticoagulant oral rivaroxaban

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Key words: bleeding, dental implants, rivaroxaban, tranexamic acid

Abstract

Objectives: The aim of this study was to evaluate the incidence of bleeding complications after dental implant placement in patients in treatment by the anticoagulant oral rivaroxaban without interrupting its administration or modifying dosage.

Materials and methods: About 57 patients were divided into two groups: 18 had been in treatment by rivaroxaban for over 6 month before implant surgery and a control group consisted of 39 healthy subjects. All subjects received dental implants in different positions, without interrupting or modifying rivaroxaban dosage. Patients were treated in an outpatient setting. Non-absorbable sutures were used, and all patients were given gauze impregnated with tranexamic acid 5%, to bite on for 30–60 min.

Results: One rivaroxaban patient presented moderate bleeding the day after surgery, and two control patients presented moderate bleeding the day after and on the second day. Bleeding was managed with gauzes impregnated with tranexamic acid. No statistically significant differences ($P = 0.688$) were found in relation to bleeding episodes between the groups, with a relative risk = 0.919 based on the pooled groups and 95% confidence interval of 0.078–10.844.

Conclusions: Dental implant surgery in patients taking the anticoagulant oral rivaroxaban can be performed safely in outpatients departments applying local hemostatic measures without the need to modify or interrupt anticoagulant medication.

To cite this article:
Gómez-Moreno G, Aguilar-Salvatierra A, Fernández-Cejas E, Delgado-Ruiz RA, Markovic A, Calvo-Guirado JL. Dental implant surgery in patients in treatment with the anticoagulant oral rivaroxaban.
Clin. Oral Impl. Res. **27**, 2016, 730–733
doi: 10.1111/clr.12653

Table 2. **Patients in treatment by rivaroxaban and control patients who suffered bleeding episodes after implant placement surgery**

Patients	No bleeding	Slight bleeding	Moderate bleeding*	Severe bleeding
Rivaroxaban patients	17	0	1	0
Control patients	37	0	2	0

*Relative risk = 0.919; $P = 0.688$; 95% confidence interval 0.078–10.844.

Cirugía de implantes en pacientes en tratamiento con dabigatrán

- 29 pacientes con dabigatrán vs. 42 sanos:
  - Implantes
  - 12 h tras última dosis de dabigatrán. Retomaban a las 8 h
  - Sutura no reabsorbible
  - Gasa tranexámico 5%
- Resultados:
  - Sangraron 2 dabigatrá y 2 control (N.S.)
- CONCLUSIONES:

Se pueden colocar implantes en consumidores de dabigatrán a las 12 h de la última dosis, retomando a las 8 h

Gerardo Gómez-Moreno
Esther Fernández-Cejas
Antonio Aguilar-Salvatierra
Félix de Carlos
Rafael Arcesio Delgado-Ruiz
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Dental implant surgery in patients in treatment by dabigatran

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Key words: bleeding, dabigatran, dental implants, tranexamic acid

Abstract

Objectives: The aim of this study was to evaluate the incidence of bleeding complications after dental implant placement in patients in treatment by the oral anticoagulant dabigatran following a specific protocol.

Material and methods: Seventy-one patients were divided into two groups: 29 had been taking dabigatran for over 6 months (150 mg orally every 12 h) before implant surgery (dabigatran group) and a control group consisting of 42 healthy subjects. Patients were treated in an outpatient setting. All subjects received dental implants in different positions, dabigatran group patients 12 h after the last dose of dabigatran. Nonabsorbable sutures were used and patients were given gauzes impregnated with tranexamic acid 5% to bite on for 30–60 min. Dabigatran patients resumed medication 8 h after the procedure, resuming usual dosage (every 12 h) the day after surgery.

Results: Two dabigatran patients and two control patients presented slight bleeding the day after surgery. Bleeding was managed with gauzes impregnated with tranexamic acid. No statistically significant differences ($P = 0.542$) were found in relation to bleeding episodes between the groups, with a relative risk of 0.675 based on the pooled groups and a 95% confidence interval of 0.090–5.088.

Conclusions: Dental implant surgery in patients taking dabigatran can be performed safely providing 12 h have passed since the last dose and local hemostatic measures are applied. Normal dosage can be resumed 8 h after implant surgery.

To cite this article:
Gómez-Moreno G, Fernández-Cejas E, Aguilar-Salvatierra A, de Carlos F, Delgado-Ruiz RA, Calvo-Guirado JL. Dental implant surgery in patients in treatment by dabigatran. *Clin. Oral Impl. Res.* **29**, 2018, 644–648
doi: 10.1111/clr.12785

Table 2. **Patients in treatment by dabigatran and control patients who suffered bleeding episodes after implant placement surgery**

Subjects	No bleeding	Slight bleeding*	Moderate bleeding	Severe bleeding
Dabigatran patients	27	2	0	0
Control patients	40	2	0	0

*Relative risk = 0.675; $P = 0.542$; 95% confidence interval = 0.090–5.088.

COAGULOPATÍAS HEREDITARIAS

Implantes en pacientes hemofílicos

HEMOFILIA

- PRECAUCIONES:

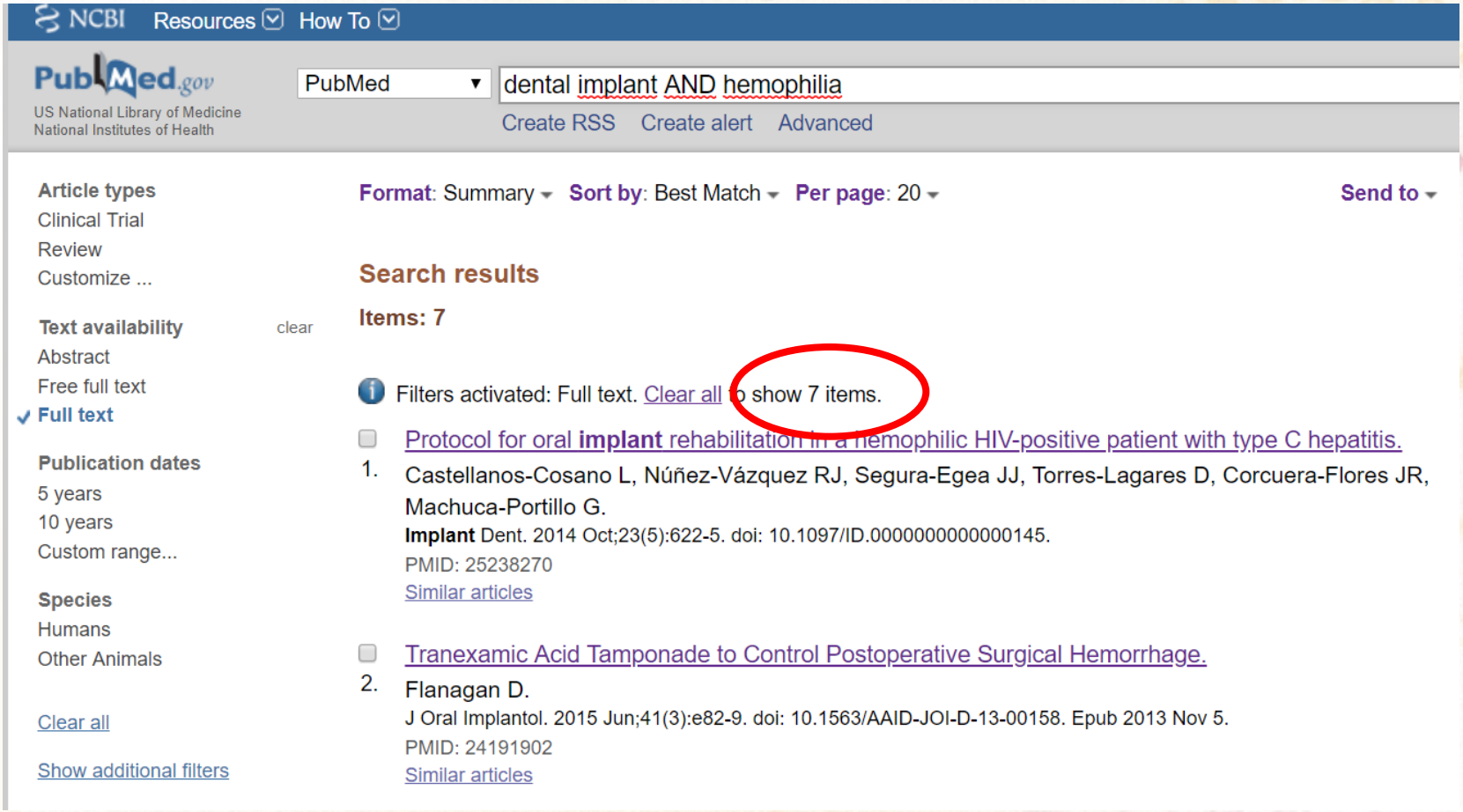
1. **1) Anestesia troncular** del nervio alveolar inferior e infiltración lingual → vascularización elevada; riesgo de hemorragia interna (compromiso vías aéreas).
    1. Técnica anestésica de elección: infiltración bucal, intrapapilar y/o intraligamentosa con Articaína.

2. 2) Uso de AINES consensuado con el hematólogo, ya que podrían interferir en la agregación plaquetaria.

3. 3) Planificación pre-operatoria (desmopresina), intraoperatoria (agentes hemostáticos, uso de sutura y de antifibrinolíticos) y post-operatoria (ácido tranexámico, desmopresina en spray nasal).

Zaliuniene R, Peciuliene V, Brukiene V. Hemophilia and oral heath. *Stomatologija, Baltic Dental and Maxillofacial journal*. 2014, 16: 127-131.
Robertson D, Nusstein J, Reader A, Beck M, McCartney M. The anesthetic efficacy of articaine in buccal infiltration of mandibular posterior teeth. *J Am Dent Assoc.* 2007, 138: 1104–12.

PubMed: "dental implants AND hemophlia"



PubMed: "sinus lift augmentation AND hemophilia": Search Results = 0

IMPLANTES Y HEMOFILIA

- No hay datos. Riesgo parecido a ex. Cordal
- Principal problema: Perforación tabla lingual
- Contraindicados injertos óseos y elevaciones sinusales
- Fundamental Scanner 3D
- Discutir el protocolo con el hematólogo

Australian Dental Journal
The official journal of the Australian Dental Association

CONSENSUS REPORT

Australian Dental Journal 2011; 56: 221–226
doi: 10.1111/j.1834-7819.2011.01328.x

Consensus statement by hospital based dentists providing dental treatment for patients with inherited bleeding disorders*

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ABSTRACT

Avoidance of dental care and neglect of oral health may occur in patients with inherited bleeding disorders because of concerns about perioperative and postoperative bleeding, but this is likely to result in the need for crisis care, and more complex and high-risk procedures. Most routine dental care in this special needs group can be safely managed in the general dental setting following consultation with the patient's haematologist and adherence to simple protocols. Many of the current protocols for dental treatment of patients with inherited bleeding disorders were devised many years ago and now need revision. There is increasing evidence that the amount of factor cover previously recommended for dental procedures can now be safely reduced or may no longer be required in many cases. There is still a need for close cooperation and discussion between the patient's haematologist and dental surgeon before any invasive treatment is performed. A group of hospital based dentists from centres where patients with inherited bleeding disorders are treated met and, after discussions, a management protocol for dental treatment was formulated.

BMJ Case Rep. 2019 Mar 22;12(3). pii: e229204. doi: 10.1136/bcr-2019-229204.

Infected tooth extraction, bone grafting, immediate implant placement and immediate temporary crown insertion in a patient with severe type-B hemophilia.

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Abstract

Haemorrhagic disorders combined with soft tissue inflammation and infection may lead to severe bleeding complications before, during or after dental treatment. In selected cases, a combined therapeutic approach involving clinical therapies and systemic and local medication could improve the treatment outcomes and the patient's quality of life. This clinical case report, presents for the first time a successful combined approach, completed in a 38-year-old male patient with severe type-B haemophilia in which an infected tooth was extracted, an immediate implant was inserted, bone grafting was performed and early implant loading was successfully applied. In addition to the clinical therapy, medication was provided orally, systemically and locally, thus preventing the haemorrhagic complications and improving the patient's quality of life.

KEYWORDS: dentistry and oral medicine; drug therapy related to surgery; haematology (incl blood transfusion); oral and maxillofacial surgery

PMID: 30904898 DOI: 10.1136/bcr-2019-229204

[Indexed for MEDLINE]

Cementable Implant-Supported Prosthesis, Serial Extraction, and Serial Implant Installation: Case Report

Harry Rosen, DDS,* and Mervyn Gornitsky, DDS†

Cementable implant-supported prostheses continue to gain popularity within the profession. Simplicity and predictability make them the restorations of choice.[1] They are particularly indicated where access for prosthetic screw placement is limited or impossible, like in posterior locations or where there is limited jaw opening. The patient in this case report suffered from limited jaw open-

Cement-retained implant-supported prostheses are particularly indicated where access for screw placement is limited or impossible like in posterior locations or where there is limited jaw opening. The patient in this case report suffered from limited jaw opening as a result of a long history of temporomandibular joint ankylosis related to hemophilia. Cement-retained implant-supported prostheses coupled with serial extraction, serial implant installations, and chairside provisional restorations made uneventful treatment possible. (Implant Dent 2004;13: 322–327)

Key Words: cement retention, chairside provisional

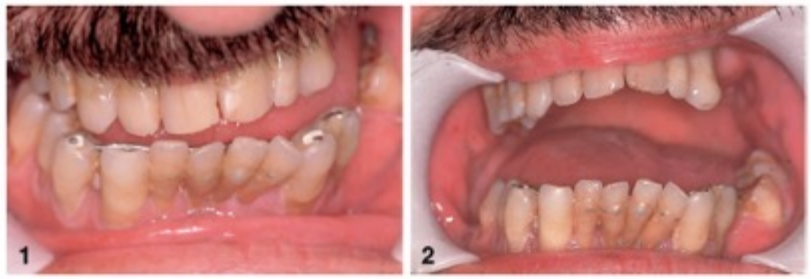

Fig. 1. Malalignment and malocclusion of lower anterior and premolar teeth.
Fig. 2. Opening between maxillary and mandibular centrals of 18 mm resulting from ankylosis of the right temporomandibular joint.

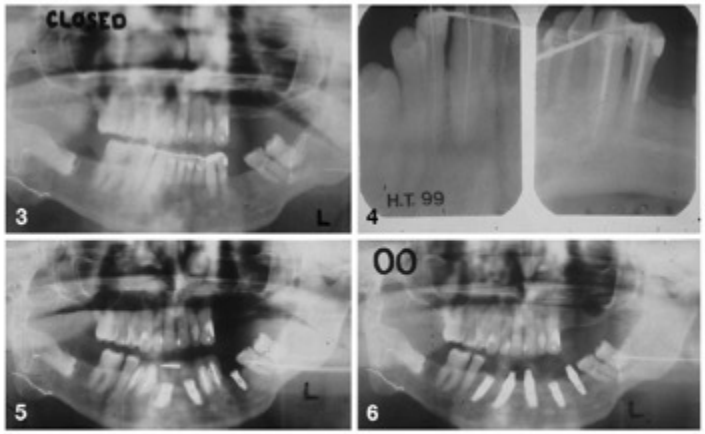

Fig. 3. Panoramic radiograph of malaligned and periodontally compromised lower teeth.
Fig. 4. Radiographs showing intentional endodontics expendable 27, 28, and 22, 21. To enable chairside temporization with an interim prosthesis in better occlusion.
Fig. 5. Panoramic radiograph showing implants installed in locations 26, 23, and 20. Implant-machined abutments retrofitted to acrylic provisional.
Fig. 6. Panoramic radiograph showing implants installed in locations 27 and 22.

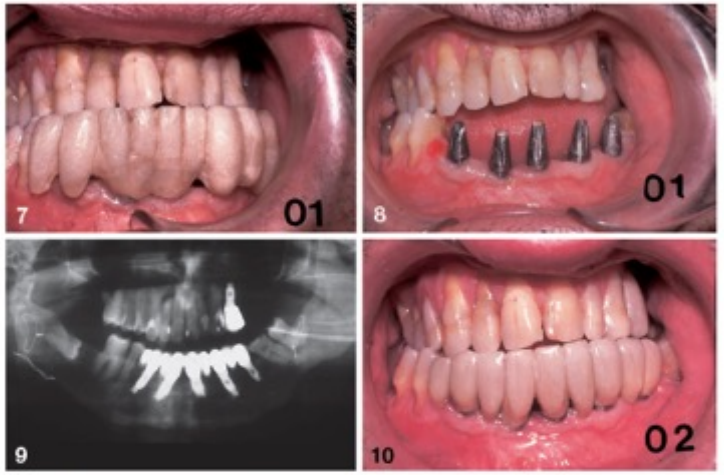

Fig. 7. Chairside provisional retrofitted and converted from tooth-supported to implant-supported acrylic prosthesis.
Fig. 8. Machined abutments tapered and smoothed in proper alignment for metal ceramic retrievable prosthesis.
Fig. 9. Panoramic radiograph showing metal ceramic implant-supported prosthesis.
Fig. 10. Final implant-supported prosthesis with passive fit cemented with TempBond. It can be tapped off when intraoral access is required.

IMPLANTES EN PACIENTES HEMOFÍLICOS (Gortnisky et al., 2005)

- ¡Único caso en PubMed hasta 2014!
- Colocación de 6 implantes (1 maxilar, 5 mandíbula) en un caso de Hemofilia A moderada (3-4% de factor VIII)
- Buenos resultados postoperatorios
- Uso de Factor VIII + ácido tranexámico

Rehabilitation of a Hemophiliac With Implants: A Medical Perspective and Case Report

Mervyn Gornitsky, DDS, FRCD(C), Wahbi Hammouda, MD, FRCP(C),† and Harry Rosen, DDS, MRCD(C)‡*

A patient suffering from classical hemophilia had previous surgery for ankylosis of the right temporomandibular joint. This was replaced by a costochondral graft and an overlay of temporalis muscle. A bilateral sagittal split was performed for a micrognathic mandible and a sleep apnea problem. That procedure solved the sleep apnea; however, it resulted in a prognathic mandible and an anterior open bite. The lower anterior teeth were periodontally involved with impaired alveolar support. The restricted opening of the oral cavity of 18 mm between maxillary and mandibular centrals and the potential danger of bleeding complicated the surgical and restorative procedures. The patient was prepared medically on each of 4 occasions with factor VIII replacement concentrate, and oral antifibrinolytic therapy (tranexamic acid). The treatment of choice was the extraction of the remaining lower incisors and their replacement with an implant-supported temporarily cemented retrievable fixed prosthesis. Serial extractions and chairside temporization provided the surgeon with precise guides for implant placement, and enabled the patient to enjoy unimpaired function through periods of healing and osseointegration.

J Oral Maxillofac Surg 63:592-597, 2005

IMPLANTES EN PACIENTES HEMOFÍLICOS (Gortnisky et al., 2005)

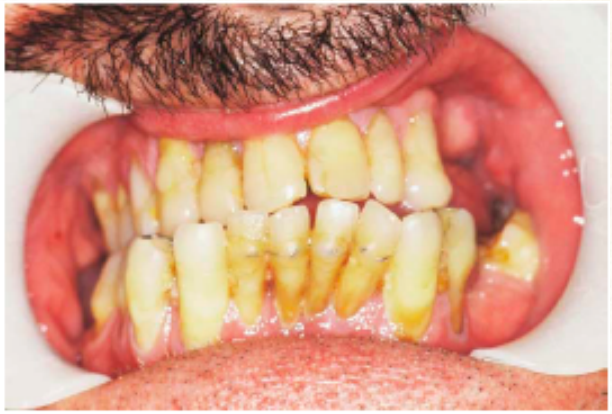

FIGURE 4. After left tuberosity reduction and selective grinding, more occlusal contacts and more pronounced over jet (horizontal overlap).

Gorntisky, Hammouda, and Rosen. Rehabilitation of a Hemophiliac With Implants. J Oral Maxillofac Surg 2005.

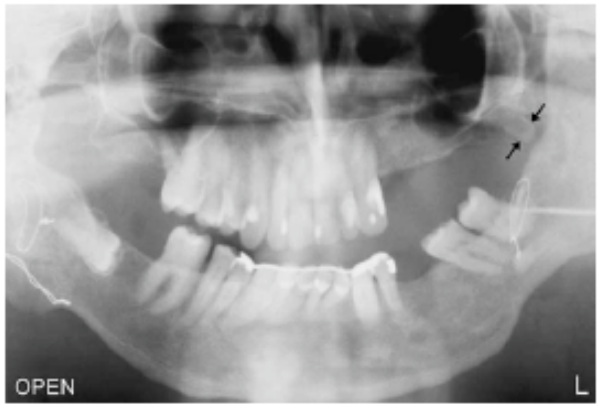

FIGURE 2. Mouth open, note the elongated left maxillary tuberosity (arrows).

Gorntisky, Hammouda, and Rosen. Rehabilitation of a Hemophiliac With Implants. J Oral Maxillofac Surg 2005.

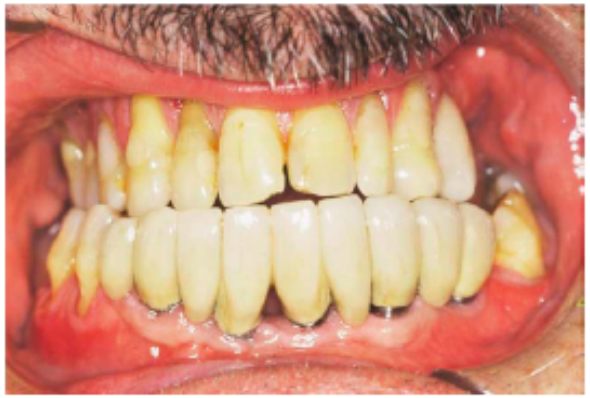

FIGURE 7. Temporarily cemented prosthesis. Note the attached gingiva and reduced over jet (horizontal overlap).

Gorntisky, Hammouda, and Rosen. Rehabilitation of a Hemophiliac With Implants. J Oral Maxillofac Surg 2005.

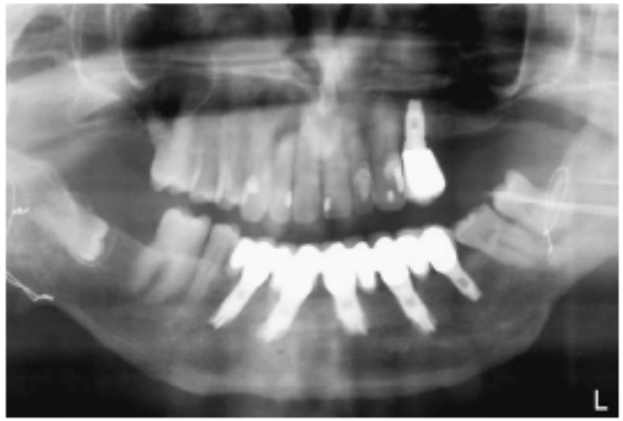

FIGURE 8. X-ray of final prosthesis.

Gorntisky, Hammouda, and Rosen. Rehabilitation of a Hemophiliac With Implants. J Oral Maxillofac Surg 2005.

Protocol for Oral Implant Rehabilitation in a Hemophilic HIV-Positive Patient With Type C Hepatitis

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Case report: *A 46-year-old man with severe hemophilia A, stage A2 HIV infection and chronic hepatitis C genotype 1A, for whom the treatment plan included implant-supported prostheses in 2 mandibular edentulous sections. The protocol followed included factor VIII replacement concentrate and oral antifibrinolytic therapy. The right mandibular section was fitted with 3 Straumann implants (Ø 4.1 mm, length 10 mm), and the left mandibular section received 2 implants of the same characteristics. The patient showed no postoperative complications. After implant placement, the patient attended scheduled review appointments. After a 3-month period of osseointegration, the prosthesis was fitted.*

Conclusions: *Although, in this case, the treatment proved successful 2 years postrehabilitation and the protocol used seems safe and effective, long-term prospective studies are needed to evaluate the implant success rate in these patients. (Implant Dent 2014;23:622–625)*

Key Words: hemophilia A, dental implant, HIV infection, hepatitis C infection

Table 1. Recommended Protocol for the Placement of Implants in Patients With hemophilia

Drug Therapy	Treatment Regimen
Tranexamic acid 1 g (OR)	1 tablet every 6 h, from the night before the procedure during 5–7 d
Factor VIII 3000 UI (IV)	15 min previous the procedure
Factor VIII 2000 UI (IV)	12 h after surgery
Factor VIII 3000 UI (IV)	24 h after surgery
Factor VIII 2000 UI (IV)	48 and 72 h after surgery
Paracetamol 500 mg	Alternate every 4 h
Metamizole 575 mg (OR)	
Amoxicilin clavulanic acid 875/125 mg (OR)	1 tablet every 8 h during 7 d

Hospital admission is recommended with observation for the first 12 to 24 hours at the discretion of the hematologist.
IU indicates international units; IV, intravenous; OR, oral.

COAGULOPATÍAS HEREDITARIAS

Implantes en pacientes con enfermedad de von Willebrand

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Tratamiento implantológico en un paciente con enfermedad de von Willebrand: Caso clínico

- Paciente de 21 años, mujer, con enfermedad de von Willebrand a la que se le repone un molar con 1 implante.
- Tratada con desmopresina.
- Implante Straumann SP y cirugía sin colgajo.
- Buen resultado final.

Dental Implant Therapy on a Patient With von Willebrand Disease: A Case Study

Michael Kang, DDS* and Philip Kang, DDS†

Von Willebrand disease (vWD) is the most common hereditary bleeding disorder. A mutation inhibiting von Willebrand factor, which is a key clotting protein that binds to factor VIII, affects platelet adhesion during wound healing.[1] Patients affected by vWD present with degrees of excessive bleeding, which may manifest in frequent nosebleeds, bleeding gums, and bruising. Female patients affected can have heavier menstrual periods. An uncommon symptom is severe internal bleeding or hemarthrosis. Clearly, vWD can pose a significant problem in a patient indicated for surgical procedures intraorally. Cases of dental surgery and extractions on vWD patients have been

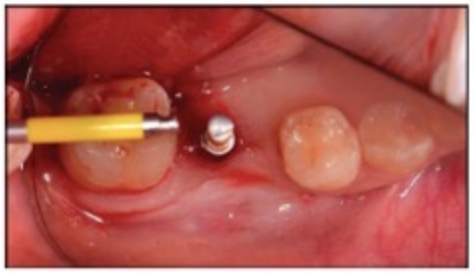
Background: *Von Willebrand disease (vWD) is the most common hereditary disorder affecting coagulation. Patients with this disorder are at a higher risk of postoperative complications after dental surgery. This article discusses the successful treatment for a patient with vWD undergoing implant therapy.*

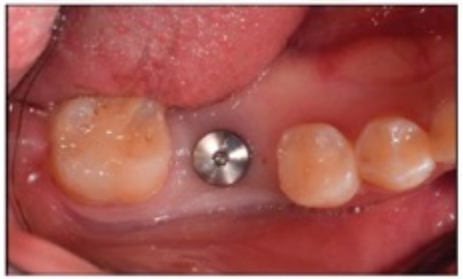
Case Description: *A young 21-year-old patient with vWD lost tooth #30 because of caries and required implant therapy. Through collaboration with a hematologist administering prophylactic desmopressin (DDAVP), the implant surgery was performed without any postoperative complications. The implant successfully integrated and was restored into function. The successful outcome met expectations after careful planning and execution.*

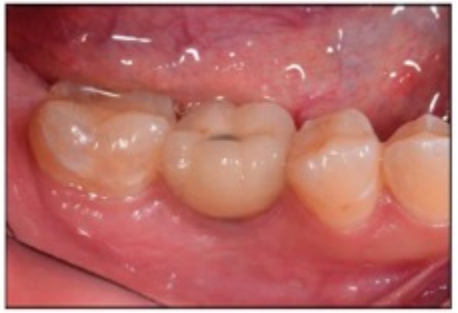
Practical Implications: *Collaboration with the appropriate medical providers, as well as treatment modifications for surgical procedures during implant therapy, is necessary for successful treatment of a patient with von Willebrand disorder.*

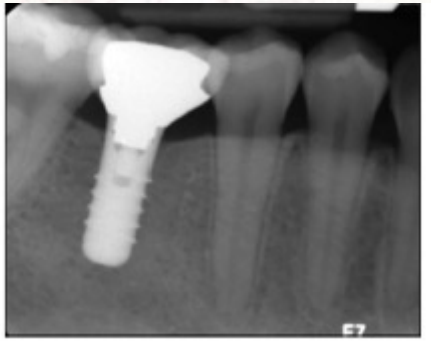
(Implant Dent 2018;27:599–601)

Key Words: *anticoagulants, hemostasis, oral surgery, periodontal surgery*









Cirugía implantológica guiada para reducir la morbilidad en un paciente con enfermedad de von Willebrand: Caso clínico

- Mujer de 49 años.
- Implante inmediato en lugar del 46 (Straumann TE)
- Cirugía guiada
- Tratamiento con factor de von Willebrand y hemostasia local
- La cirugía mini-invasiva parece útil para minimizar la hemorragia postoperatoria

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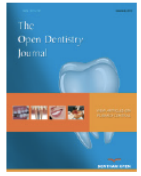

CASE REPORT

Guided Implant Surgery to Reduce Morbidity in Von Willebrand Disease Patients: A Case Report

Mathilde Fénelon[1,2], Sabine Castet[3], Jean-Christophe Fricain[1,2] and Sylvain Catros[1,2,*]

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[2]*Inserm U1026, BioIngénierie Tissulaire, University of Bordeaux, Bordeaux, France*
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Received: November 17, 2017 Revised: December 20, 2017 Accepted: January 05, 2018

Abstract:

Introduction:

Von Willebrand Disease is the most common inherited bleeding disorder. In the general population, 1/8000 patients are affected. Primary hemostasis (platelet adhesion) and coagulation (protection of Factor VIII) are altered. Among several bleeding symptoms, these patients suffer from excessive bleeding of oral mucosa and dental management requires a close collaboration between haematologists and oral surgeons.

Materials & Methods:

Guided implant surgery can be used to increase the accuracy of implant placement and to reduce the overall morbidity of this surgical procedure by using a flapless surgery technique.

Case Report:

We report the case of a 49 years old woman having a Type 2A von Willebrand disease and who presented to replace tooth #.46 because of interradicular fracture and peri-apical infection. After planning the implant surgery using Codiagnostix® software, a surgical guide was prepared. The patient received 4 injections of von Willebrand factor (Willfactin®) for this particular surgical procedure. The implant was placed immediately after tooth removal and local haemostasis was performed.

Discussion:

The follow-up was uneventful and the implant was restored by a crown 4 months later. Two cases of implant placement in haemophiliac patients have been reported before in the literature.

Conclusion:

As far as we know, this is the first case report of implant placement in a patient having a von Willebrand disease. The use of guided surgery allowed to perform a mini-invasive procedure and thus contributed to prevent bleeding complications in this patient.

Keywords: Dental implant, Oral surgery, Von Willebrand disease, Bleeding disorder, Hemostasis, Guided surgery.

COAGULOPATÍAS HEREDITARIAS

Implantes en pacientes con déficit del factor XIII (estabilizador de fibrina)

- No hay evidencia acerca de que estas enfermedades contraindiquen los implantes, pero…
- Estos pacientes no son un buen grupo de riesgo y deberían ser evaluados médicamente de manera meticulosa
- ¡La profilaxis de la endocarditis no está recomendada si se va a realizar una colocación transepitelial de los implantes! (Scully y cols., 2007)

- Casi todos los estudios avalan la colocación de implantes en mayores. Las series no presentan diferencias significativas con los más jóvenes (Bryant & Zarb, 1998; Kondell y cols., 1988)
- El éxito depende de otros factores intercurrentes como enfermedades, medicación, institucionalización, etc. (Esposito y cols, 1998)

- Aunque sería razonable pensar que alteran la oseointegración no hay apenas estudios que lo justifiquen (no hay evidencia), sólo trabajos limitados en los que puede asumirse…
  - Hay gran controversia sobre si la mandíbula se afecta igual que otros huesos por la osteoporosis en mujeres postmenopaúsicas
  - Hay gran controversia sobre si la osteoporosis afecta la oseointegración
    - Importancia de la fijación primaria
    - ¡Menos éxito en sinus lifts en postmenopaúsicas que usan TRH!
    - ¡Pero hay series de pacientes con gran osteoporosis rehabilitados con éxito!
  - Efecto adverso de bisfosfonatos ("osteoquimionecrosis"), que se reduce con un buen tratamiento previo, pero sólo no haciendo cirugías en estos pacientes podríamos evitarlos

CLIMACTERIC 2010;13:523–529

Periodontitis and osteoporosis: a systematic review

Mª Á. Martínez-Maestre, C. González-Cejudo, G. Machuca, R. Torrejón and C. Castelo-Branco†*

Gynecology Division, Hospitales Universitarios Virgen del Rocío, Seville; *Faculty of Odontology, University of Seville; †Clinic Institute Gynecology, Obstetrics and Neonatology, Hospital Clinic, University of Barcelona, IDIBAPS, Spain

Key words: PERIODONTITIS, OSTEOPOROSIS, BONE MINERAL DENSITY, BONE FRACTURE, DENTAL LOSS

ABSTRACT

Background Osteoporosis and periodontitis are frequent disorders that affect aging populations. It has been hypothesized that both conditions may be related.

Objective To determine whether dental osteoporosis is a local manifestation of systemic bone loss having similar etiology and risk factors, or whether it is an independent process depending primarily on factors that cause periodontitis.

Methods A systematic review of clinical trials assessing the relationship between osteoporosis and periodontitis was carried out. An electronic search was made based on Internet search engines, MEDLINE (from 1966 to December 2009) and the Cochrane Controlled Clinical Trials Register.

Results A total of 145 studies dealing with the relationship osteoporosis–periodontitis were identified. Of them, 35 were considered suitable for selection. Studies on maxillary and/or mandible radiological findings have a positive correlation in the majority of the cases (18 positive vs. three negative), whereas the findings on clinical periodontal examination are inconclusive (six positive vs. five negative). There were ten studies in which a diagnosis of osteoporosis was made, based on the existence of non-traumatic fracture, while there were nine studies using radiographs for diagnosis, of which six studies were found to have a positive correlation. There was only one study based on a clinical periodontal examination that found a positive correlation.

Conclusions The majority of the studies suggested a relationship between osteoporosis and periodontitis. Further well-controlled studies are needed to better elucidate the inter-relationship between systemic and oral bone loss and to clarify whether dentists could usefully give an early warning for osteoporosis risk.

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Vol. 20, No. 1, pp. 000-000
DOI: 10.1097/gme.0b013e31825d24cf

Osteoporosis, fragility fracture, and periodontal disease: a cross-sectional study in Spanish postmenopausal women

Maria Angeles Martínez-Maestre, MD, PhD,[1] Guillermo Machuca, PhD,[2] Carmen González-Cejudo, MD,[1] José Ramón Corcuera Flores, PhD,[2] Rafael Torrejón Cardoso, MD,[1] and Camil Castelo-Branco, MD, PhD[3]

Abstract

Objective: Osteoporosis and periodontitis are common disorders that affect aging populations. It has been hypothesized that both conditions may be related. The aim of this study was to evaluate the relationship between osteoporosis and periodontitis using vertebral fragility fracture as a real marker of osteoporosis and periodontal clinical examination to define periodontitis.

Methods: Six hundred thirty-four women aged 55 to 70 years, with fragility spine fractures, and living in the same healthcare region of Seville, Spain, were invited to take part in this cross-sectional study conducted from 2008 to 2010. All the women included in the study were referred to undergo spine radiological examination, spinal densitometry, and full-mouth periodontal assessment.

Results: With the exception of number of teeth (19 in the fractured postmenopausal group and 23 in the control group; $P < 0.007$) and sites with a clinical attachment level lower than 7 mm ($P < 0.048$), there were no significant differences in clinical and periodontal parameters among women in the fractured postmenopausal group and the control group. In short, fractured postmenopausal women have lost more teeth with more advanced attachment loss (clinical attachment level >7 mm). None of the definitions of periodontitis used resulted in significant differences between groups.

Conclusions: The relationship between periodontitis and osteoporosis remains unclear, and further studies considering fragility fracture as a real marker of osteoporosis are warranted to clarify the exact role and effect of one condition on the other and the corresponding clinical implications.

Key Words: Periodontitis – Osteoporosis – Bone mineral density – Bone fracture – Dental loss.

Conclusiones:

- La osteoporosis (evaluada mediante el MCL) no parece aportar un riesgo especial en la pérdida ósea marginal de los implantes.
- Los parámetros que afectan de manera adversa al desarrollo de la pérdida ósea marginal en los implantes son:
  - Historia previa de periodontitis
  - Colocación en hueso regenerado

Relationship Between Osteoporosis and Marginal Bone Loss in Osseointegrated Implants: A 2-Year Retrospective Study

José R. Corcuera-Flores,* Ana M. Alonso-Domínguez,* M. Ángeles Serrera-Figallo,* Daniel Torres-Lagares,* Lizett Castellanos-Cosano,* and Guillermo Machuca-Portillo*

Background: Fitting implants in osteoporotic patients has traditionally been controversial, and there is little scientific evidence relating osteoporosis to marginal bone loss (MBL). The aims of this study are as follows: 1) to evaluate the possibility of a correlation between osteoporosis, as measured by the mandibular cortical index (MCI), and MBL and 2) to assess how various systemic diseases, periodontitis, and placement of implants in regenerated bone are correlated with MBL and MCI.

Methods: This retrospective study examines 212 implants inserted in 67 patients. To take a possible cluster failure into account, an implant for each patient was selected (n = 67 implants). MBL was assessed. Osteoporosis was evaluated using the MCI. Both MBL and MCI were assessed from panoramic radiographs. χ^2 test was performed (Haberman post hoc test). Significance was $P < 0.05$.

Results: When the total sample implant (N = 212) was evaluated, a significant association was found between the presence of osteoporosis and MCI ($P < 0.001$) and between the presence of diabetes mellitus and MCI ($P < 0.01$). Significant associations were also found between MBL and placement of implants in regenerated sites ($P < 0.001$) and between MBL and a previous history of periodontitis ($P < 0.05$). When the sample is evaluated only in selected implants (one per patient, n = 67), significant differences appear to relate only to the MBL with the placement of implants in regenerated bone sites ($P < 0.001$).

Conclusions: Osteoporosis (as evaluated by MCI) does not pose a risk for the development of greater MBL. Parameters adversely affecting the development of increased MBL are a previous history of periodontitis and especially the placement of implants at sites of bone regeneration. *J Periodontol 2016;87:14-20.*

KEY WORDS

Bone regeneration; disease; osteoporosis; peri-implantitis; periodontal disease.

* Faculty of Odontology, University of Seville, Seville, Spain.

Osteoporosis is defined as a systemic metabolic disease in which patients have low bone mass and display defects in bone microarchitecture.[1] This increases bone fragility and can lead to a higher risk of fractures.[1]

Although the study of bone density remains the "gold standard" for assessing whether a patient has osteoporosis or not, a recent study on osteoporotic females with pathologic bone fractures demonstrate that osteoporosis can be identified reliably in a panoramic radiograph[2] by using radiomorphometric indices such as the mandibular cortical index (MCI). This index allows patients to be categorized into three groups according to their degree of osteoporosis: 1) those with no bone pathology (C1), 2) the osteopenia group (C2), and 3) the osteoporosis group (C3).[3]

Peri-implantitis was first described by Mombelli et al.[4] in 1987 as infectious and pathologic changes in peri-implant tissues. It can be diagnosed clinically (bleeding on probing, probing depth [PD] >5 mm, or three or more implant threads exposed)[5,6] or radiologically (marginal bone loss [MBL]). MBL is defined as bone loss around the implant, and this study is based on that variable.

It should be noted that bone loss of 0.2 mm around implants in the first year is considered normal.[7] Subsequently, bone

Relationship Between MBL and Other Test Variables for One Implant per Patient and All of the Implants

Variable	MBL (Class)					P
	0	1	2	3	4	
One implant (n = 67)						
MCI Class						NS
1	17 (77.3)	3 (13.6)	0 (0.0)	1 (4.5)	1 (4.5)	
2	19 (52.8)	13 (36.1)	3 (8.3)	0 (0.0)	1 (2.8)	
3	5 (55.6)	3 (33.3)	1 (11.1)	0 (0.0)	0 (0.0)	
GBR						<0.001
Yes	4 (28.6)*	6 (42.9)	1 (7.1)	1 (7.1)†	2 (14.3)*	
No	37 (69.8)*	13 (24.5)	3 (5.7)	0 (0.0)†	0 (0.0)*	
Previous periodontal disease						NS
Yes	20 (54.1)	11 (29.7)	4 (10.8)	1 (2.7)	1 (2.7)	
No	21 (70.0)	8 (26.7)	0 (0.0)	0 (0.0)	1 (3.3)	
All implants (N = 212)						
MCI Class						NS
1	46 (60.5)	23 (30.3)	2 (2.6)	1 (1.3)	4 (5.3)	
2	54 (45.8)	52 (44.1)	8 (6.8)	0 (0.0)	4 (3.4)	
3	10 (55.6)	7 (38.9)	1 (5.6)	0 (0.0)	0 (0.0)	
GBR						<0.001
Yes	10 (23.8)‡	24 (57.1)*	4 (9.5)	1 (2.4)†	3 (7.1)	
No	100 (58.8)‡	58 (34.1)*	7 (4.1)	0 (0.0)	5 (2.9)	
Previous periodontal disease						<0.05
Yes	59 (44.4)	57 (42.9)	9 (6.8)	1 (0.8)†	7 (5.3)	
No	51 (64.6)	25 (31.6)	2 (2.5)	0 (0.0)	1 (1.3)	

NS = non-significant.
All data presented as n (%) implants.
* $P<0.01$, Haberman test.
† $P<0.05$; Haberman test.
‡ $P<0.001$, Haberman test.

Relationship Between MCI and Other Test Variables for One Implant per Patient and in All of the Implants

Implant	MCI (Class)			P
	1	2	3	
One implant (n = 67)				
Osteoporosis				NS
Yes	1 (11.1)	5 (55.6)	3 (33.3)	
No	21 (36.2)	31 (53.4)	6 (10.3)	
Diabetes mellitus				NS
Yes	4 (26.7)	10 (66.7)	1 (6.7)	
No	18 (34.6)	26 (50.0)	8 (15.4)	
All implants (N = 212)				
Osteoporosis				<0.001
Yes	2 (10.0)	11 (55.0)	7 (35.0)	
No	74 (38.5)	107 (55.7)	11 (5.7)	
Diabetes mellitus				<0.01
Yes	8 (17.8)	35 (77.8)	2 (4.4)	
No	68 (40.7)	83 (49.7)	16 (9.6)	

NS = non-significant.
All data presented as n (%) implants.