

Prevalence Biological Complications in Patients with dental Implants for 10 years

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ABSTRACT

Objective: To evaluate the prevalence of biological complications for 10 years in patients with dental implants by reviewing clinical reports (2012-2022) of the University Foundation UniCIEO.

Method: Analytical retrospective study approved by the Ethics Committee as risk-free research. The clinical histories of selected the medical records of patients of the Oral Implantology Clinic University UniCIEO (2012-2022), with report during the first 30 days of: age, gender, pre-existing diseases, habits, type of prophylaxis, type of surgery, implants and bone graft. Biological complications: pain, flushing, edema, tissue dehiscence and scarring. Descriptive statistics through analysis of contingency tables and inferential Chi-square test.

Results: Total of medical records that met the inclusion criteria 229. Range of age (26 - 82 years). Women 143 average age (54.9 years), men 86 average age (56.9 years). Presence of pre-existing diseases 122 patients (53.28%). Prophylaxis with amoxicillin 228 patients (99.5%), whit pain (2.62%), edema (4.80%), flushing (4.37%), suppuration (1.75%), tissue dehiscence (13.10%) for a total prevalence of biological complications of 26.64% with correct healing (86.46%). Bone grafts (51.97%), allograft (41,92%) y Xenograft (10,05%). the number of implants placed in the surgical procedure (1 – 13), the most frequent being 2/ procedure. The Chi-Square Test showed no significant association between the type of prophylaxis and the presence of each of the biological complications ($p > 0.005$).

Conclusion: The prevalence of biological complications for 10 years in patients with dental implants use of Amoxicillin prophylaxis was low and tissue dehiscence was the most frequently with high percentage of correct healing.

Keywords

Biological Complications, Dental Implants, Healing.

Introduction

Increasing oral implant therapy has shown that prevention and control of biological complications are important to ensure successful osseointegration. In addition to a complete clinical examination and treatment plan, proper surgical technique and clinical check-ups during the first 30 days post-surgery are important in preventing biological complications that can lead to implant loss [1,2].

Superficial infections may occur along the suture line, postoperative soft tissue infection can be attributed to insufficient adjustment of the closing screw, preoperative contamination, or retained sutures. In general, the most important cause of delayed wound healing is interference with microcirculation; this may be due to local vessel damage or be a consequence of decreased circulation caused by prolonged traumatic surgery and the technique. Tissue dehiscence is the most frequently reported complication in the literature in implant surgery [3].

Epithelial healing after non-surgical and surgical periodontal therapy is performed within the first 7 to 14 days [4]. Wound healing is a complex biological process consisting of hemostasis, inflammation, proliferation and tissue remodeling. Many cell types are involved in this process [5]. Multiple factors can cause alterations by affecting one or more phases of the wound healing process and are classified into local and systemic factors [6]. The influences of these factors are not mutually exclusive, single or multiple factors may play a role in one or more of the phases contributing to result of the healing process [7]. The implant material plays an important role with the healing process. Titanium or titanium alloy became the metal of choice for implantation devices in medicine and dentistry due to its biocompatibility and corrosion resistance provides a surface conducive to cell proliferation, differentiation and survival [5,6,8], demonstrated that the success of implants in dentistry is based on proper professional academic training, proper selection of patients, careful surgery with detailed prior planning and postoperative care. This has an impact on the osseointegration process, the success of implants and the well-being of patients.

Leknes et al., 2005 [9], Evaluated tissue reactions to silk suture materials and expanded polytetrafluoroethylene (PTFE) placed in oral tissues. It was concluded that the placement of oral silk sutures in gingival tissues causes greater inflammatory reactions than those of PTFE and silk sutures seem to infection after the placement of dental implants have a poor prognosis, with a prevalence of success of 33.5%.

Annibali et al., 2015 [1]; demonstrated that local complications arising during implant surgery may be the main determinants of the outcome of the entire rehabilitation program. Hence, the prevention of such complications is a priority objective for the surgeon.

Pippi R; 2017 [10], evaluated and highlighted the main clinical findings of surgical wound healing especially in periodontal and Oral implant surgery. It concludes that follow-up of wound healing should always be performed for early identification of signs and/or symptoms possibly related to surgical complications.

Fathima et al. 2017 [5]. In the review of clinical trials, they document consistently high success rates around 90% for endosseous dental implants in partially or completely edentulous patients. They concluded that patient-related factors appear to be more critical than those related to the implant in determining the likelihood of implant disease.

Camps-Fonts et al., 2018 [7] in retrospective cohort study with 1,322 patients and 2,673 implants. They concluded that patients who suffer a postoperative infection after the placement of dental implants have a poor prognosis, with acumulative survival of 33.5%.

Okamoto et al., 2018 [11]. In comparative study between the factors that affect the presence of early complications in patients with and without complications, after the placement of dental implants is such as patient history, implant characteristics and implant placement site. Okamoto et al., 2018 they concluded that early-stage complications were more frequent in older subjects suffering from systemic diseases and receiving anticoagulant therapy.

Heitz- Mayfield et al., 2018 [12], The objective was to review issues related to biology, risks and complications associated with dental implantology, demonstrated that probing bleeding alone is insufficient for the diagnosis of peri-implantitis. Implant therapy for geriatric patients is not contraindicated; however, comorbidities and autonomy should be taken into account.

Borisenko et al. 2020, [4]. In a study on early postoperative complications in patients with dental implants, they concluded that patients with generalized periodontitis present deterioration of wound healing, purulence of the postoperative wound, severe pain and deterioration of sensitivity after implantation with a frequency of 53.33%. Concluding that dental implant surgery in patients with periodontal diseases, close attention should be paid to preoperative preparation with significant difference selection of antibacterial and anti-inflammatory drugs.

Yaman et al. 2021, [13]. They evaluated the bacterial colonization and clinical properties of ten different suture materials in dentoalveolar surgery. Showed that multifilament sutures had greater bacterial colonization than monofilament sutures with significant difference ($p < 0.001$) and the healing process was better with monofilament sutures than multifilament sutures with significant difference ($p = 0.019$). Non-absorbable sutures demonstrated significantly better epithelialization than absorbable sutures ($p < .001$).

Previous studies have shown that the risk of contracting infections

in oral implant surgeries depends on several factors such as: asepsis of the place of procedure, patient health, skill of professional personnel, type of surgery, technique and type of suture used, surgical time, type of implant and correct antimicrobial prophylaxis to identify and manage biological complications, by preventing or diagnosing early and decreasing the risk of Failure of dental implants.

Objective

To evaluate the prevalence of biological complications for 10 years in patients with dental implants by reviewing clinical reports (2012-2022).

Method

Observational, analytical, retrospective cross-sectional research (January 2012 to December 2022). Approved by the Institutional Ethics Committee as "Research without risk" (Annex 1), the medical records of patients who underwent any procedure of surgery and oral implants were selected, with at least 1 clinical control during the first 30 days. From the reports in the medical records patients, the variables studied were: Age, gender, pre-existing diseases, habits (smoking), type of prophylaxis, type of surgery, surgical time, number of implants placed in each procedure; report of early complications: pain, flushing, edema, tissue dehiscence and healing. All variables were applied Descriptive statistics and inferential statistic through analysis of contingency Chi square T-test. Using Minitab software with significant table level (p>0.005).

Results

Of the total medical records of patients (502) who underwent any oral implantology procedure during the 10 years, only 229 (45.6%) met the inclusion criteria: reporting the type of oral implant surgery and with at least one postoperative control during the first 30 days. The age range ranged from 26 to 82 years, women 143 with average age 54.9 years and men 86 with average age 56.9 years. The median number of implants per procedure in the total sample was two with a maximum of 7 in women and 13 in men. Healthy patients (46.72%), with pre-existing diseases (53.28%), the most frequent being gastrointestinal (15.7%) and cardiovascular (14.4%) reported in medical records (Table 1).

Pain	12	5,24
Autoimmune	9	3,93
Cardiovascular	33	14,4
Diuretic	4	1,75
Gastrointestinal	36	15,7
Hormonal	19	8,30
None	107	46,7
Psicological	2	0,87
Pulmonary	7	3,06
TOTAL	229	

Table 1: Medical History Conteo Porcentaje.

Medical records with prophylactic prescription of Amoxicillin (99.53%), oral mucosal smear and antibiogram 1 patient (0. 5%). Presence of biological complications 30 days post- surgery pain, flushing, edema and suppuration, the most frequent biological complication was tissue dehiscence (13.1%). Most patients had good healing (86.5%) (Table 2).

Variable	YES	NO	TOTAL
Pain	6 (2.6%)	223 (97.4%)	229
Edema	11 (4.8%)	218 (95.2%)	229
Flushing	10 (4.4%)	219 (95.6%)	229
Supuration	4 (1.8%)	224 (98.2%)	229
Dehiscence	30 (13.1%)	199 (86.9%)	229
Healing	198 (86.5%)	31 (13.5%)	229

Table 2: Biological complications.

The most used graft material was the Allograft in 96 patients (41.92%) of them presented correct healing 79 (82.3%) and the most frequent complication was tissue dehiscence 18 (18.8%). With use of Xenograft 14 patients (6.11%) good healing (92.9%); tissue dehiscence 1 patients (7.3%) (Table 3).

Variable	ALLOGRAFT			XENOGRAFT		
	SI	NO	Total	SI	NO	Total
Pain	5 (5.2%)	91 (94.8%)	96	0 (0%)	14 (100%)	14
Edema	6 (6.3%)	90 (93.8%)	96	0 (0%)	14 (100%)	14
Blush	7 (7.3%)	89 (92.7%)	96	0 (0%)	14 (100%)	14
Suppuration	2 (2.1%)	94 (97.9%)	96	0 (0%)	14 (100%)	14
Dehiscence	18 (18.8%)	78 (81.3%)	96	1 (7.3%)	13 (92.2%)	14
Cicatrization	79 (82.3%)	17 (17.7%)	96	13 (92.9%)	1 (7.1%)	14

Table 3: Type of graft vs biological complications.

Pre-existing diseases controlled with medications (46,72%), the most frequent being gastrointestinal and cardiovascular. The most frequent biological complication was tissue dehiscence (10.7%).

Discussion

In the present study, Healthy patients (46.72%), the prevalence of all biological complications at 30 days was low (13.5%) with high percentages of adequate healing (86.1%). These results are much lower than those reported in the study of Borisenko et al. [4] where the presence of complications was (53.33%), possibly due to the individual of the subjects of each study and antibiotic prophylaxis. In the present study, tissue dehiscence was presented in (13.1%) which is different the results reported in the study by Borisenko et al. 2020 [4] where tissue dehiscence was (8.89%), it could be due to

the fact that in the current retrospective study a greater time range was taken (2012-2022). Tissue dehiscence is the most frequently reported complication in the literature in implant surgery Sculean A, et al. 2014 [3].

It was also demonstrated in the present study that the age of the patients and the presence of controlled pre-existing diseases were not related to the presence of biological complications; which coincides with the results of Sadig, Almas 2004 [8], where he recommends that the success of implants is based on the adequate training of the professional, the selection of the patient and postoperative care. Patients who received bone grafts prior to implantation surgery had a low prevalence of biological complications and a high percentage of correct healing.


Conclusion

The prevalence of biological complications for 10 years in patients with dental implants and use of Amoxicillin prophylaxis was low and tissue dehiscence was the most frequently with high percentage of correct healing.

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Anexo 1.



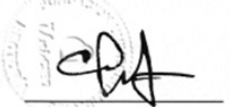
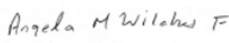

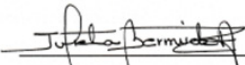
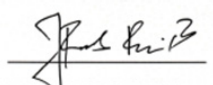
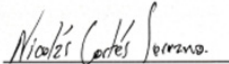
DEFINICIONES:

Resolución 8430 DE 1993

ARTÍCULO 11

Investigación sin riesgo: Son estudios que emplean técnicas y métodos de investigación documental retrospectivos y aquellos en los que no se realiza ninguna intervención o modificación intencionada de las variables biológicas, fisiológicas, psicológicas o sociales de los individuos que participan en el estudio, entre los que se consideran: revisión de historias clínicas, entrevistas, cuestionarios y otros en los que no se le identifique ni se traten aspectos sensitivos de su conducta.

Dado en Bogotá, D.C., el 20 de agosto de 2021

 DR. CAMILO QUINTANA MEJÍA	 DRA. ÁNGELA MARÍA WILCHES FLOREZ
 DR. JAIRO NARANJO DOUSDEBÉS	 DRA. JULIETA BERMÚDEZ ALARCÓN
 DR. JAIME RODRIGO RIVERA	 DR. NICOLÁS CORTÉS SERRANO



**EL COMITÉ DE ÉTICA DE INVESTIGACIÓN DE LA
FUNDACIÓN UNIVERSITARIA CIEO "UnicIEO",**

de acuerdo con la facultad que le confiere la **Resolución 8430 de 1993** por la cual se establecen las normas científicas, técnicas y administrativas para la investigación en salud, en su **ARTÍCULO 11** donde se clasifican las investigaciones según el riesgo en: Investigación sin riesgo, **Investigación con riesgo mínimo** e Investigación con riesgo mayor que el mínimo.

Resuelve otorgar el aval ético **número 141 del acta 69**, a la investigación denominada:

**"DETERMINACIÓN DE COMPLICACIONES BIOLÓGICAS EN IMPLANTOLOGÍA ORAL.
ESTUDIO RETROSPECTIVO A 10 AÑOS"**

presentada como Trabajo de Grado en la especialización de Implantología Oral y Reconstructiva cuyos investigadores son:

1. PAULA ANDREA BETANCUR SÁNCHEZ
2. ALEXANDRA PALACIO BERRIO
3. JONATAN SMELLY DUARTE CÁRDENAS
4. BEATRIZ CEPEDA (Investigador principal)

dado que después de analizado el proyecto se determinó que es una investigación **sin riesgo**.

Este aval tiene una validez de dos años a partir de la fecha y queda claro que todo cambio en el diseño de la investigación debe ser reportado al comité.

