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Updates in Implant Dentistry: Summary Report of the 9th International Symposium of the Moroccan Society of Periodontology and Implantology

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ABSTRACT

Implant supported-crown is considered as a predictable and a safe therapeutic option to replace missing teeth. Since many years, it was established that a sufficient amount of bone around implants is an important criterion to achieve successful osseointegration. Actually, it became evident that a sufficient amount of supra-crestal soft-tissue is likewise crucial to have around implants in order to avoid biologic and esthetic complications. The strengthening the patient's immunity is also another crucial parameter that arises recently. The aim of this paper is to give a summary report of the 9th international symposium of the Moroccan Society of Periodontology and implantology based on the available current scientific evidence.

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Lecture 1 (Speaker Frank Schwarz)

Surgical Management of Peri-Implantitis in the Esthetic Zone

Peri-implantitis is a plaque induced disease that involve soft and hard tissues around implants, characterized by mucosal inflammation and progressive bone loss [1]. The prevalence of peri-implantitis is high in Moroccan patients (41.4% at the subject level and 22.7% at the implant level, respectively) [2]. On the contrary to periodontitis, the treatment of peri-implantitis is not predictable in all clinical situations. Based on the current evidence, non-surgical treatment should be first performed in order to make a healthier peri-implant soft tissue before considering adjunctive surgical treatment [3,4]. The defect morphology is a crucial parameter to define the surgical approach needed. Schwarz et al classified peri-implantitis bone defects into 3 classes: angular (Infra-bony defects), horizontal (Supra-bony defects) and combined defects [5]. Reconstructive treatment is indicated in cases of peri-implantitis with angular defect. However, resective therapy is indicated in cases of horizontal defects [6]. The surgical management of peri-implantitis stills challenging in esthetic area. Avoiding mucosal recession after surgical treatment is not always possible. It seems reasonable to assume that surgical management of peri-implantitis in esthetic area is often associated with soft tissue grafting in order to minimize the risk of the development of mucosal recession and also to facilitate oral hygiene [7,8]. Papilla preservation flap designs are preferred in the esthetic area. A full-split flap design may be advantageous when a Guided Bone Regeneration (GBR) is performed. The flap is released in full thickness in the coronal area corresponding to the supra-bony defect. Then, it is released in split thickness apically. This technique allows secure fixation of the membrane to the periosteum.

Lecture 2 (Speaker Philipe Preshaw)

Diabetes and Peri-Implantitis

Diabetes mellitus (DM) is a collective term for a set of metabolic disorders, with chronic hyperglycemia being the primary manifestation [9]. The interrelation between DM and periodontal diseases was well documented in the literature [10]. This interrelationship was supported by the 2017 world workshop of the European Federation of Periodontology and American Association of Periodontology [11]. The same impact of DM was noted also in peri-implant tissue. The implant survival rate in DM patients has been reported to be between 83.5% and 100% [12]. A recent study of prevalence and risk indicators of peri-implant diseases in group of Moroccan patients found that Peri-implantitis were higher in persons with a history of DM [2]. The impact

of DM On peri-implant tissue was evaluated through clinical and radiographic parameters. Moraschini et al, showed that DM patients undergoing implant treatment exhibited approximately 0.2 mm more Marginal Bone Loss (MBL) than healthy patients [13]. Jiang et al reported, in their meta-analysis, higher pocket probing depth around implants in DM patients than in healthy patients [14]. Tan et al. showed that each 1% increase in HbA1c was significantly associated with 10% higher Bleeding on Probing (BOP) [15]. Dioguardi et al. found also an elevated BOP and MBL in DM patients than in healthy patients [12]. Understanding the clinical association between diabetes and peri-implantitis is essential for optimizing implant therapy among these patients. Therefore, the importance of glycaemia control and maintaining proper oral hygiene plays a crucial role to prevent peri-implantitis.

Lecture 3 (Speaker Darko Bosic)
Collagenous Soft Tissue Matrices for Soft Tissue Augmentation Around Implants

For many years, scientific research in implant dentistry was focused on the hard tissue around implants, establishing that the amount and the quality of bone around implants are the important criteria to achieve success. Buccal bone thickness of at least 2 mm was suggested to maintain marginal bone levels around implants [16]. However, the supra-crestal soft issue is also a crucial parameter to maintain peri-implant health and avoid denudation of implants. Different surgical techniques were described in the literature. The autologous soft tissue grafts (Connective Tissue Graft (CTG) and Free Gingival Graft (FGG) are considered as the most predictable technique to increase soft tissue thickness and width [17,18]. However, due to high morbidity related to a second surgical site, soft tissue substitutes were developed as an alternative treatment of the autologous soft tissue grafts. Thoma et al. in a recent randomized clinical trial showed that both Collagen Matrix (CM) and CTG leaded similarly to peri-implant soft tissue stability over time [16]. Based on the International Team of Implantology Guide on peri-implant soft tissue integration and management published in 2021 by Roccuzzo and Sculean, the available evidence indicates that in cases with a narrow band of keratinized tissue around implants, soft tissue substitutes like CM could be a good alternative of autologous soft tissue grafts [18].

Lecture 4 (Speaker Joseph Choukroun)
Osseo-Immunology and Implant Dentistry

The aim of strengthening the patient's immunity is to reduce complications and failures resulting from immune deficiency and inflammation that persists beyond the 5th day. This will accelerate the osseointegration of implants and bone grafts. Pre-operative assessment of patient's immunity is a crucial step [19]. Supplementation with vitamin D in patients with a low level could help enhancing osseointegration of dental implants. A recent systematic review of human studies supported the positive association of vitamin D levels and osseointegration. The authors suggested that vitamin D deficiency is considered as a potential risk factor of implant failure [20]. The vitamin D ideal rate for patients requesting a surgery is estimated to 50-70ng/ml. Regarding antibiotics, Azithromycin is considered as the antibiotic of choice due to its powerful immune effect and its high concentration in gingival tissue. Data of literature showed that azithromycin could better improve resolution of post-operative inflammation than amoxicillin [21]. Another important factor is related to the operator; a minimally invasive approach avoiding tissue trauma could reduce tissue oxidation which will improve tissue wound-healing. Vitamin C supplementation may also enhance tissue wound-healing due to its antioxidant and immunomodulator properties [22].

Lecture 5 (Speaker Andrea Mombelli)
Peri-Implant Diseases: Risk Factors and Differential Diagnosis

The pathogenesis of peri-implantitis is mainly based on bacterial colonization of implant surfaces. The uncontrolled accumulation of bacterial plaque induces inflammation of the peri-implant mucosa. This inflammation regresses generally as soon as the bacterial deposits are eliminated. In addition, the microbiota of peri-implantitis sites shows significant quantitative and qualitative differences compared to healthy sites [1]. Peri-implantitis risk factors could be grouped into three broad categories: patient, implant/prosthesis and iatrogenic/ environmental related factors. Well-established factors include a history of periodontitis, history of mucositis, poor maintenance and poor oral hygiene, as well as lifestyle or general health factors such as smoking, hyperglycemia and obesity. Local factors such as implant malposition, poorly designed or hard-to-clean prostheses and excess cement also increase the risk of disease development. Certain conditions require more evidence, notably genetic predispositions, certain systemic disorders, the use of bisphosphonates and the presence of titanium particles [2,23]. Roccuzzo et al. reported that posterior implants lacking keratinized tissue are associated with greater marginal bone loss and a higher prevalence of peri-implant diseases [24]. Finally, the combination of several factors, such as the association of periodontitis and smoking, potentiates the risk of onset and progression of peri-implantitis. It is therefore essential, in clinical practice, to distinguish modifiable factors from non-modifiable factors to adapt our therapeutic approach.

Lecture 6 (Speaker Peter Fairbairn)
True Bone Regeneration-What the Body Needs. Translating Biology into Successful Implant Dentistry

Alloplasts are synthetic, inorganic, and biocompatible bone substitutes used as fillers to repair skeletal defects. A combination of calcium sulfate (CS) and β-tricalcium phosphate (β-TCP) enhances the handling properties of these materials, eliminating the need for a traditional membrane in guided bone regeneration [25]. The local immune response, both innate and adaptive, plays a key role in the fate of an implanted biomaterial. In the classic foreign body reaction, M1 macrophages, mast cells, neutrophils, and $CD4^+$ Th1/Th2 lymphocytes are activated, leading to the formation of multinucleated giant cells, chronic inflammation, and fibrous encapsulation of the implant. In contrast, the addition of mesenchymal stem cells to the biomaterial promotes the activation of M2 macrophages, regulated Th1 cells, regulatory T lymphocytes (Tregs) and osteoclast genesis followed by the recruitment of new stem cells, likely of skeletal origin, which then differentiate into osteoblasts to form bone [26]. The field of osteoimmunology aims to modulate the local immune response to rapidly shift from a pro-inflammatory state to a pro-resolution and regenerative state [27]. Another key characteristic of this synthetic bone graft is its granular structure, which provides macro-porosity. A study evaluated different commercial biomaterials in two granule sizes. Small granules showed significantly lower permeability and slower fluid flow compared to large granules, with higher hydraulic tortuosity. The granules form 3D scaffolds that mimic trabecular bone, and their arrangement strongly affects accessibility for bodily fluids and progenitor cells [28]. The protocol for implant placement and grafting with the material (65% β-TCP, 35% CS) begins with curettage, debridement, and rinsing of the extraction sockets with sterile saline. After four weeks, a site-specific full-thickness buccal flap is raised, preserving the adjacent papillae. Granulation tissue is removed and an implant is placed. The site is then augmented with the material (65% β-TCP, 35% CS), mixed with saline to form a moldable material that hardens in situ. No barrier membrane is used. The flaps are sutured with resorbable

4-0 sutures, which are removed after seven days. After ten weeks, a similar flap is raised to access the cover screw. Implant stability is measured using resonance frequency analysis (Osstell ISQ). A healing abutment is placed, the flap is sutured, and after two weeks, the final titanium abutment and a cemented metal-ceramic restoration are placed [29]. Based on current evidence, β-TCP/CS is a promising bioactive alloplastic bone substitute. Flifl et al showed that β-TCP/CS is biocompatible, osteoconductive, and resorbable, making it a reliable alternative to xenografts and allografts for bone regeneration in oral and maxillofacial procedures [30].

Lecture 7 (Speaker Frank Schwarz)

Advanced Soft Tissue Management for Challenging Hard Tissue Augmentation

The most frequently reported complications in the regeneration of alveolar ridge defects include wound dehiscence and membrane or graft exposure, occurring in 5–54% of cases. Less frequent complications involve infection or loss of graft material (7–13%), paranesthesia (7–13%) and major postoperative swelling (4%) [31]. Graft or membrane exposure represents the most critical scenario, as it significantly compromises clinical and radiographic outcomes. In fact, membrane exposure results in 27% less defect fill in dehiscence-type defects [32]. These observations highlight the need for a deeper reflection on the fundamental components of predictable regenerative therapy: Barrier membrane, Flap design/soft tissue management, and Scaffold.

Component 1: Barrier Membrane

The main characteristics of an effective barrier membrane include biocompatibility, biological activity, porosity or occlusive properties, tissue integration, exposure tolerance, and biodegradability. Increasing evidence suggests that membranes actively promote bone regeneration [33]. Native collagen membranes cause fewer wound dehiscence than cross-linked collagen or non-resorbable membranes, due to their high biocompatibility, reduced inflammatory reaction, and better soft-tissue integration. Although there is a moderate risk of graft or membrane exposure with native collagen membranes, such exposures are common but generally manageable, as they tend to be less detrimental and present a lower infection risk compared with exposures of cross-linked collagen or non-resorbable membranes.

Component 2: Flap Design/Soft-Tissue Management

Full-thickness flaps combined with modified periosteal releasing incisions help reduce tension and improve vascularization. This combination flap design appears to result in lower rates of wound dehiscence and fewer graft or membrane exposures compared with conventional full-thickness flaps. This technique also allows secure fixation of the membrane to the periosteum, enhancing stability. Zhang et al, reported that the membrane should be fixed using either resorbable sutures or titanium pins to ensure optimal stability [34].

Component 3: Scaffold

According to the consensus published in 2019 at the 15th European Workshop on Periodontology on Bone Regeneration, the available evidence did not identify any specific protocol, procedure, or grafting material as clearly superior [31]. Clinicians may therefore select among autografts, xenografts, allografts, alloplasts, or combinations thereof, based on the clinical situation, defect morphology and patient-related factors [31]. Current evidence indicates that successful alveolar ridge regeneration depends on the combined use of an effective barrier membrane, a well-designed flap, and a suitable scaffold. Combined surgical procedure using implantoplasty, GBR and CTG could be an encouraging approach to control advanced peri-implantitis cases [8].

The authors Wafa El Kholti and Ghita kadri have contributed equally to this work.

Conflicting Interest

The authors declare no conflicts of interest

References

1. Tord Berglundh, Gary Armitage, Mauricio G Araujo, Gustavo Avila-Ortiz, Juan Blanco, et al. (2018) Peri-implant diseases and conditions: Consensus report of workgroup 4 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. J Clin Periodontol 45: S286-S291.
2. Kissa J, El Kholti W, Chemlali S, Kawtari H, Laalou Y, et al. (2020) Prevalence and risk indicators of peri-implant diseases in a group of moroccan patients. J Periodontol 92: 1096-1106.
3. Herrera D, Berglundh T, Schwarz F, Chapple I, Jepsen S, et al. (2023) Prevention and treatment of peri-implant diseases-The EFP S3 level clinical practice guideline. Journal of Clinical Periodontology 1-73.
4. Hom-Lay Wang, Gustavo Avila-Ortiz, Alberto Monje, Purnima Kumar, Javier Calatrava, et al. (2025) AO/AAP consensus on prevention and management of peri-implant diseases and conditions: Summary report. J Periodontol 96: 519-541.
5. Schwarz F, Herten M, Sager M, Bieling K, Sculean A, et al. (2007) Comparison of Naturally Occurring and Ligature-Induced Peri-Implantitis Bone Defects in Humans and Dogs. Clinical Oral Implants Research 18: 161-170.
6. Monje A, Schwarz F (2022) Principles of Combined Surgical Therapy for the Management of Peri-Implantitis. Clin Adv Periodontics 12: 57-63.
7. Monje A, Tavelli L, Rasperini G, Wang HL (2021) Pedicle Flap Designs for Soft Tissue Conditioning in the Therapy of Peri-implantitis. Int J Periodontics Restorative Dent 41: 295-301.
8. Schwarz F, Sahm N, Becker J (2014) Combined surgical therapy of advanced peri-implantitis lesions with concomitant soft tissue volume augmentation. A case series. Clin Oral Impl Res 25: 132-136.
9. American Diabetes Association (2020) Classification and diagnosis of diabetes: standards of medical care in diabetes-2020 Diabetes. Care 43: S14-31.
10. Chemlali S, El Kholti W, El Ouadghiri M, Kissa J (2025) The Effectiveness of Periodontal Treatment to Improve Glycated Hemoglobin a Levels in Diabetes Patients. Journal of Dental Science Research Reviews & Reports 7: 1-4.
11. Papapanou PN, Sanz M, Budunelli N (2018) Periodontitis: Consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. J Clin Periodontol 45: S162-S170.
12. Mario Dioguardi, Stefania Cantore, Cristian Quarta, Diego Sovereto, Nicoletta Zerman, et al. (2023) Correlation between diabetes mellitus and peri-implantitis : a systematic review. Endocrine, Metab Immune Disord - Drug Targets 23: 596-608.
13. Moraschini V, Barboza ES, Peixoto GA (2016) The impact of diabetes on dental implant failure : a systematic review and meta-analysis. Int J Oral Maxillofac Surg 45 : 1237-1245.
14. Jiang X, Zhu Y, Liu Z, Tian Z, Zhu S (2021) Association between diabetes and dental implant complications: a systematic review and meta-analysis. Acta Odontol Scand

79: 9-18.

15. Tan SJ, Bahraini B, Nabil S, Mohd N, Zhu Y (2021) Does glycemic control have a dose-response relationship with implant outcomes? A comprehensive systematic review and meta-analysis. J Evid Based Dent Pract 21: 101543.
16. Thoma DS, Gasser TJW, Hämmerle CHF, Strauss FJ, Jung RE (2022) Soft tissue augmentation with a volume-stable collagen matrix or an autogenous connective tissue graft at implant sites : Five-year results of a randomized controlled trial post implant loading. J Periodontol 94: 1-14.
17. Valles C, Vilarrasa J, Barallat L, Pascual A, Nart J (2022) Efficacy of soft tissue augmentation procedures on tissue thickening around dental implants: A systematic review and meta-analysis. Clinical Oral Implants Research 33: 72-99.
18. Roccuzzo, Sculean (2021) The International Team of Implantology Guide on peri-implant soft tissue integration and management. Quitessence Publishing 2021 https://www.quintessence-publishing.com/usa/en/product/peri-implant-soft-tissue-integration-and-management.
19. Choukroun E, Parnot M, Surmenian J, Gruber R, Cohen N, et al. (2024) Bone Formation and Maintenance in Oral Surgery: The Decisive Role of the Immune System-A Narrative Review of Mechanisms and Solutions. Bioengineering (Basel) 11: 191.
20. Buzatu BLR, Buzatu R, Luca MM (2024) Impact of Vitamin D on Osseointegration in Dental Implants: A Systematic Review of Human Studies. Nutrients 16: 209.
21. Escalante MG, Eubank TD, Leblebicioglu B, Walters JD (2015) Comparison of Azithromycin and Amoxicillin Before Dental Implant Placement: An Exploratory Study of Bioavailability and Resolution of Postoperative Inflammation. J Periodontol 86: 1190-1200.
22. Cenzato N, Khijmatgar S, Carloni P, Dongiovanni P, Meroni M, et al. (2023) What is the use of nutraceuticals in dentistry? A scoping review. Eur Rev Med Pharmacol Sci 27: 4899-4913.
23. Hashim D, Cionca N (2020) A Comprehensive Review of Peri-implantitis Risk Factors. Current Oral Health Reports 7: 262-273.
24. Andrea Roccuzzo, Jean-Claude Imber, Alexandra Stähli, Mario Romandini, Anton Sculean, et al. (2025) Role of Keratinized Mucosa on the Risk of Peri-Implant Diseases and Soft Tissue Dehiscence in the Posterior Mandible-A 20-Year Prospective Cohort Study. Journal of Periodontal Research 0: 1-10. doi: 10.1111/jre.70018.
25. Chia Wei Cheah, Nisreen Mohammed Al-Namnam, May Nak Lau, Ghee Seong Lim, Renukanth Raman, et al. (2021) Synthetic Material for Bone, Periodontal, and Dental Tissue Regeneration: Where Are We Now, and Where Are We Heading Next? Materials 14: 6123.
26. Paul Humbert, Meadhbh Á Brennan, Noel Davison, Philippe Rosset, Valérie Trichet, et al. (2019) Immune Modulation by Transplanted Calcium Phosphate Biomaterials and Human Mesenchymal Stromal Cells in Bone Regeneration. Frontiers in Immunology 10: 663.
27. Richard J Miron, Marc Bohner, Yufeng Zhang, Dieter D Bosshardt (2004) Osteoinduction and osteoimmunology: Emerging concepts. Periodontol 2000 94: 9-26.
28. Chappard D, Kün-Darbois JD, Guillaume B (2020) Computational fluid dynamics simulation from microCT stacks of commercial biomaterials usable for bone grafting. Micron 133: 102861.
29. Fairbairn P, Leventis M (2015) Protocol for Bone Augmentation with Simultaneous Early Implant Placement: A Retrospective Multicenter Clinical Study. Int J Dent 2015: 589135.
30. Mohammed Ali Saleh Flifl, Hamdy Marzook, Mona Denewar, Heba Abo-Elfetouh Elsheikh (2022) Biological Impact of Alloplastic Bone Graft vs Bovine Xenograft and Allograft Materials in Bone Healing: An Experimental Study. J Contemp Dent Pract 23: 482-491.
31. Søren Jepsen, Frank Schwarz, Luca Cordaro, Jan Derks, Christoph HFH, et al. (2019) Regeneration of alveolar ridg defects. Consensus report of group 4 of the 15th European Workshop on Periodontology on Bone Regeneration. J Clin Periodontol 21: 277-286.
32. Jeffrey Garcia, Austin Dodge, Paul Luepke, Hom-Lay Wang, Yvonne Kapila, et al. (2018) Effect of membrane exposure on guided bone regeneration: A systematic review and meta-analysis. Clin Oral Implants Res 29: 328-338.
33. Omar O, Elgali I, Dahlin C, Thomsen P (2019) Barrier membranes: More than the barrier effect?. Clin Periodontol 46: 103-123.
34. Zhang S, Wang Y, Wang Q Jinmeng Li, Feifan Wang, et al. (2024) The impact of collagen membrane fixation protocols on volume stability in horizontal ridge augmentation in the aesthetic area: A retrospective study. Clin Implant Dent Relat Res 26: 1354-1365.