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Editorial

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## From Osseointegration to Digital Implantology

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Dental implantology is the area of dentistry that allows restoring function and esthetics to patients who for any reason have lost one or more of their teeth <sup>1</sup>. But implantology is not only the osseointegrated implant. Implantology goes beyond just inserting the implant in the residual ridge; it requires a thorough clinical and imaging assessment, knowledge of jaw biomechanics and occlusal forces, collaborative work between different specialties, oral and maxillofacial surgery, periodontics, orthodontics, and oral prosthetics.

Brånemark, the father of modern implantology, managed to implement with his experiments what we now know as dental implantology. More than 70 years have passed by since this scientific event revolutionized dentistry. While conducting studies on bone consolidation in rabbit tibiae, he discovered that titanium was integrated into the bone and it was not possible to remove it easily. From this discovery, the concept of osseointegration was born, which is defined as the direct contact between the living bone and the surface of the implant at a microscopic level<sup>2</sup>. Since then, he began the dissemination and implementation of new projects that allowed him to work together with plastic surgery, otorhinolaryngology, and dentistry.

Technological and scientific advances have driven the constant evolution of contemporary dentistry. In this sense, digital implantology allows dental procedures to be performed with greater precision and therefore greater predictability; that is, well-designed flaps focused on atraumatic and minimally invasive surgeries. The freehand technique has been left behind and without surgical guides, now we work with computer-aided design and manufacturing (CAD/CAM), implementing the digital flow from diagnosis, treatment plan, implant placement, to the final rehabilitation, thus achieving an increase in the speed of design and manufacture of prostheses<sup>3</sup>.

Digital implantology, based on the biological foundations of osseointegration, is an approach that has revolutionized the way of diagnosing, planning, and executing treatments in dental implantology. However, technological advances continue and will allow us to experience new options through Artificial Intelligence (AI), facilitating the recognition of implants, the prediction of success in their placement, as well as the design of personalized implants<sup>4</sup>.

It is necessary to ponder how digital implant dentistry can transform the way surgical treatments are currently performed in increasingly demanding clinical scenarios.

## **BIBLIOGRAPHIC REFERENCES**

1. Manohar J, Ashok V, Dinesh SPS. A retrospective study on implant prosthesis in missing maxillary anteriors among middle-aged adults. *J Long Term Eff Med Implants*. 2020; 30(3): 187-191. DOI: 10.1615/JLongTermEffMedImplants.2020035984
2. Brånemark PI. Osseointegration and its experimental background. *J Prosthet Dent*. 1983; 50(3): 399-410. DOI: 10.1016/s0022-3913(83)80101-2
3. Agnini A, Coachman C. *Digital dental revolution: The learning curve*. Chapter 1. Rho, Italy: Quintessenza Edizioni; 2015.
4. Revilla-León M, Gómez-Polo M, Vyas S, Barmak BA, Galluci GO, Att W, *et al*. Artificial intelligence applications in implant dentistry: a systematic review. *J. Prosthet. Dent*. 2021; 129(2): 293-300. DOI: 10.1016/j.prosdent.2021.05.008