

Implant 2.0: Where Biology Meets Smart Tech

Dr. G. Venkata Prasanna¹, Dr. C. Dastagiramma¹, Dr. Kalamalla A SaranBabu^{2*} and Dr. T. PavanKumar³

ISSN: 2690-9707



***Corresponding author:** Dr. Kalamalla A Saran Babu, Associate professor, Department of prosthodontics Narayana Dental college and hospital, Nellore, Andhra Pradesh, India

Submission: 📅 May 02, 2025

Published: 📅 May 13, 2025

Volume 4 - Issue 1

How to cite this article: Dr. G. Venkata Prasanna, Dr. C. Dastagiramma, Dr. Kalamalla A SaranBabu* and Dr. T. PavanKumar. Implant 2.0: Where Biology Meets Smart Tech. Associative J Health Sci. 4(1). AJHS. 000576. 2025.
DOI: [10.31031/AJHS.2025.04.000576](https://doi.org/10.31031/AJHS.2025.04.000576)

Copyright@ Dr. Kalamalla A SaranBabu, This article is distributed under the terms of the Creative Commons Attribution 4.0 International License, which permits unrestricted use and redistribution provided that the original author and source are credited.

¹Post graduate student, Department of prosthodontics Narayana Dental college and hospital, Nellore, Andhra Pradesh, India

²Associate professor, Department of prosthodontics Narayana Dental college and hospital, Nellore, Andhra Pradesh, India

³Professor&Hod Department of prosthodontics Narayana Dental college and hospital, Nellore, Andhra Pradesh, India

Opinion

Traditional implants, designed primarily for functional and aesthetic tooth replacement, have undergone significant advancements in biomaterials and biomechanics to improve osseointegration, longevity and durability. However, limitations in early diagnosis of complications such as peri-implantitis and mechanical failure have driven the development of smart dental implants; a paradigm shift in modern implant dentistry. The evolution of smart implants signifies the future of implantology, offering predictive diagnostics, preventive care, and a new standard in patient-centered dental treatment.

Smart dental implants integrate biosensors, microelectronics, and wireless communication technologies, enabling real-time monitoring of critical parameters like occlusal forces, pH levels, and temperature. These advanced implants offer early detection of complications and personalized treatment, significantly improving patient outcomes. Self-powered energy systems and miniaturization have enhanced the practicality and durability of these devices, while wireless data transmission enables continuous remote monitoring. Henceforth, smart dental implant technology, its potential clinical applications, and future directions there by bridging the gap between traditional implantology and digital dentistry. Smart dental implants hold the potential to revolutionize oral healthcare, offering a new standard in implant performance and patient monitoring.

References

1. Park M, Islam S, Kim HE, Korostoff J, Blatz MB, et al. (2020) Human oral motion-powered smart dental implant (SDI) for in situ ambulatory photo-biomodulation therapy. *Adv Healthcare Mater* 9(16): e2000658.