Finding the missing pieces of the puzzle in peri-implantitis

In 2018, Dr Luigi Canullo was awarded the William R. Laney Award for the second time. The prestigious prize is awarded annually by the Academy of Osseointegration and is considered to be its highest scientific recognition. Dr Canullo received the award for his latest research study, titled "Association between clinical and microbiologic cluster profiles and peri-implantitis". In this study, he investigates the association between clinical and microbiological profiles and peri-implantitis in order to categorise the condition into different groups.

Dr Canullo is an international speaker on the surgical and prosthetic aspects of implant dentistry and is a specialist in aesthetic implantology, bone reconstruction and platform switching. He has given guest lectures at the universities of Valencia in Spain and Pisa in Italy, and to this day, continues to collaborate with these institutions. Moreover, Dr Canullo is a research leader working with some of the most important universities around the world. He is currently researching soft-tissue interaction and abutments with Prof. Anton Sculean from Bern in Switzerland.

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He graduated *cum laude* in dentistry and dental prosthetics from the Sapienza University of Rome in Italy and received his PhD from the University of Bonn in Germany. He also has postgraduate courses from the State University of New York and the University of California, Los Angeles in the US.

Apart from his academic work, Dr Canullo is an active member of the Italian Academy of Osseointegration and the European Association for Osseointegration. Today, he runs a private practice in Rome that focuses on oral implantology, surgery and implant-supported prosthetic rehabilitation. *implants* had the opportunity to ask Dr Canullo about the main findings of his award-winning study and what they mean for implant dentistry in the future.

Dr Canullo, you were presented with the William R. Laney Award again in 2018. Could you please elaborate on the awarded study and tell us the key reasons behind it having been conducted?
As you stated, I have had the good fortune to be awarded the William R. Laney Award twice within the last five years. This time around, I received the award for a study on peri-implantitis. Throughout the past decade, I had worked a lot on platform switching, which was the topic of the work for which I earned the first award. After that, how-

ever, I felt the urge to change my focus. At the moment, peri-implant diseases represent a hot subject within our field. Based on the claims of current research and systematic reviews, the prevalence of this pathology is very relevant today, since between 15 and 42 % of treated patients show symptoms of it. Despite the incredibly high number of cases, however, the treatment success rate is still extremely low and recent systematic reviews suggest there will continue to be a low success rate in the short or medium term when using a non-surgical and regenerative approach. In my opinion, this shows that there are still some missing links in the aetiology and treatment chain. This is the reason the group led by Prof. Miguel Peñarrocha Diago at the University of Valencia, of which I am proud to be a part, started to work on this topic.

How did you set up the study, and what were its main findings?

The objective of this work was to investigate the association between clinical and microbiological profiles and peri-implantitis in order to eventually categorise the disease into different groups. For this purpose, subjects with at least one implant presenting signs of peri-implantitis and one healthy implant were selected. The clinical, radiographic, occlusal and microbiological profiles of these infected implants were collected. Cases were then classified into five peri-implantitis groups according to potential disease-triggering factors: surgically associated, prosthetically associated, biomechanically associated, purely plaque-associated and a combination of these. Generalised estimating equation models were used to study the differences among potential risk factors. Cluster analyses were applied to investigate the correlation between clinical and microbiological profiles and diseased implant samples.

In total, 55 patients with 110 diseased and 121 healthy implants were included in the study. The findings of the cluster analyses demonstrated that the associated factor of peri-implantitis can be predicted: the biomechanically associated group showed higher levels of microbiological contamination inside the connection, but the plaque-associated group had a higher level of microbial variety in the peri-implant sulcus. In conclusion, the outcomes of the study proved that it seems fair to say that, while peri-implantitis represents a plaque-induced inflammatory condition, certain local factors might be associated with this biological complication, as they involve plaque retention. Therefore, I would argue that, if further implemented with the associated surgical, prosthetic and biomechanical factors, the disease classifications can help to better target the aetiology.

With new technologies in dental implantology steadily evolving, what significance do you think peri-implantitis will hold for your field of expertise in the future?

I believe that new technologies such as computer-assisted surgery or intraoral scanners and the evolu-

tion of abutment and implant surfaces will potentially make our job as clinicians a lot safer. And for patients, being able to plan an entire procedure extraorally without any pressure will result in safer surgical procedures and reduced chair times. At the same time, faster osseointegration periods through newly developed activated surfaces and stronger soft tissue–abutment integration through new rough surfaces for abutments will likely result in implant-supported restorations that are very resistant to bacterial infections, thus, reducing the prevalence of peri-implantitis in the long run.

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