Digital Workflow: a precise way to achieve state of the art smiles

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The 13th Annual MegaGen International Symposium was held at the Takanawa Congress Centre, Tokyo, Japan, on the 14 and 15 October. Some of the world’s most renowned dentists were on stage, for over two days, giving lectures of science and technology.

The title of this meeting was “Digital Smile”, so most of the topics were related to the field of digital dentistry. The title of my lecture was: “Cloud dentistry”—how the cloud is helping dentists and patients around the world achieve state-of-the-art smiles through digital technology and platforms.

I have been practising dentistry for 20 years now, and it is safe to say that the first technology I invested in, back in 1999, was a digital intraoral X-ray and intraoral camera. Previously, these were made by a company named Trophy, which is now Carestream. I am currently on my third generation of X-ray devices. I have always been a big fan of lower doses of radiation, both for my patients and for my team. In 2008, we got the CBCT from Kodak, which is also from Carestream. This has revolutionised the way that we practise implant dentistry because this third dimension is essential for understanding sensitive parts of the anatomy. This allows us to place more implants, more safely and better than ever. The same way that we have transitioned from analogue cameras to digital cameras, dentistry is shifting from analogue traditional procedures to digital procedures.

More recently, in the last two years, we have invested heavily in technology that allows us to really enter an era of digital dentistry in its totality. I am talking about intraoral scanners, 3-D printers, and software and technologies that allow us to produce surgical guides, from partial to fully guided surgeries.

We are also now using Low Level Laser Therapy for healing, T-scan for testing the occlusion, and I believe that we are turning my clinic into a type of laboratory of the future in terms of dentistry. Recently, we founded a department for Research and Development, headed by Dr Ana Paz, which ensures that all the data is collected from our clinicians and confirms that the science is solid around the treatment sequences that are performed.

One of the cases that I presented in Japan, and which I believed profoundly marked my team and...
Figs. 3 & 4: R2 Gate digital planning.– Figs. 5–10: Implant guided surgery with R2 Gate surgical guide. – Fig. 11: CBCT images after implant surgery. – Figs. 12–14: PMMA structures and DSD design using a smile donator. – Figs. 15–17: Intraoral scanner and gum modulation with GrandioSO composite (VOCO). – Figs. 18 & 19: Final situation.
The most was of a young 27-year-old patient, who we treated free of charge. She had lost everything in her life: her husband, her home, her job, and now she was about to lose her child. The reason was because she could not get work due to the total destruction of her smile.

We got in touch with MegaGen, Carestream, and VOCO, and a few other companies that came together and helped us deliver what I believe to be digital magic in dentistry.

With the CBCT, my team shared the DICOM files with the team in Korea and Romania, who manufactured the R2 Gate fully guided surgical template and pre-milled PMMA prosthetic structure from molar to molar, using a smile design platform. And since it was fully digital, pre-milled customised zirconia abutments were placed on the day of the surgery and screwed down to support the PMMA structure. This took a few weeks, and we received this through the mail. Once we had the material needed, surgery went very smoothly, and on the same day we placed all the implants. Some of them were placed using the latest root membrane technique, and we delivered the PMMA. The whole procedure took two hours, changing this patient’s life dramatically forever. In the following weeks and months, we took intraoral scans and started designing the fully milled zirconia structure. Please follow the images illustrating this case.

To sum up, I feel that digital technologies will help and assist younger generations of dentists achieve incredible results, because these treatment sequences can be planned by teams in other parts of the world, and mitigate responsibilities by insuring that the quality of the treatment plan is perfect. However, I guess that the greatest message that all dentists should take home is that, even though self-driving cars are coming, you will still have to know how to drive. By this, I mean that you still have to understand how to practise gold standard classical dentistry; even though robotics and digital dentistry can really speed things up, you still have to know what you are doing.

I believe that the future in dentistry is bright and fun, and I am really excited for the things to come.

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**Dr Miguel Stanley**

was born in Durban, South Africa, to a British mother and a Portuguese father. He studied to become a Doctor of Dental Surgery and has several postgraduate degrees in the field of cosmetic dentistry and implant surgery. He built an impressive practice and became one of the most reputed dentists in the country. He lectures all over the world on his work, and this is one of his great passions.

In order to help pay for his education he was a model with Elite Model Look. Having done his first TV commercial at the age of 15, he went on to do over 60 TV commercials. This close understanding of the TV industry helped him create over six TV shows as the author, executive producer and host, all in the area of medical makeover shows.