

CAD/CAM

international magazine of digital dentistry

3²⁰¹⁵



| **review**

Abutment selection
and long-term success

| **case report**

Implant-prosthetic restorations

| **interview**

The impact of CAD/CAM on dental practices

A close-up photograph of the DSi 6000 Impression Scanner. The device is a black, handheld unit with a silver-colored scanning head. A dental impression, made of a pink and green material, is being scanned. The scanner is mounted on a black base. The background is a light blue and white surface.

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2

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Beyond any measure

Dear Reader,

As I think back to my younger days, I used to love to take things apart and try to put them back together. That progressed into a hobby as a bike mechanic. Cable replacement, greasing the bearings, wheel truing...I loved it all. I had minimal tools, but I had the know-how of how to get the job done. When I got my dream job as a shop mechanic, I was amazed that there was actually a proper tool for every job. The wrenches and ratchets were literally the tools of the trade. It occurred to me, the mechanic needed to understand what the tools were for, how to use them and especially how to care for them. I realised and appreciated the importance of the tools, but did not want them to be the limiting factor.

Dentistry is experiencing a truly remarkable period with many 'tools' of digital dentistry available to the clinician and technician. These tools are not only providing increased accuracy and improved efficiency, but are also improving the experience for the patient, clinician and technician. Communication has also been expanded with digital dentistry, allowing for easier translation of information to the patient, the insurance company, colleagues and the laboratory. With an open-source approach, the technologies have the opportunity to be merged and shared. Add in the advances in mobile technology, the portability and the utilisation of technology becomes even more appealing. From an academic and research perspective, I can attest that I am truly a tech junkie. I love gadgets. Technology seems to improve every aspect of my day. I find the technological solution to a problem a unique driving force that harnesses limitless passion. It appears to be an exciting time!

The spectrum of digital dentistry has become quite overwhelming. There are technologies that provide numerous approaches for image acquisition, easy-to-use design packages, milling/printing solutions, implant stability assessment and even real-time guided implant surgery. The technologies seem to represent every aspect of diagnoses, treatment planning and treatment delivery. This issue entirely reflects that statement. Whitepeaks Dental Solutions provides insight into their scanners, CNC and CAD/CAM. CAD/CAM is explored in greater detail, as Dr Ferencz reviews its impact on dental practices, while Dr Zamanian discusses its use with implant abutments. Lastly, a clinical guide to Max Align is presented. Max represents a new technology that not only offers a digital alternative to the facebow/facial analyser, but also provides a unique set of patient records. It appears to be a very exciting time!

But let's not let the excitement overwhelm us.

In dentistry, we have the privilege of improving the oral health of our patients. There can be little comparison to a bike mechanic, as the human body presents a unique set of complex systems. However, the technologies in digital dentistry represent tools. These tools have a purpose and we must be able to understand what the tools are for and how to use them. The tools cannot act as substitutes to fundamental principals. As clinicians and technicians, we must rely on our knowledge, skills and evidence-based experience to act as our guide. From the subjective aspect of patient informed consent, to the rigorous protocols of implant surgery, let us exercise what our comprehensive training has taught us. The tools are merely there to assist us on our mission.

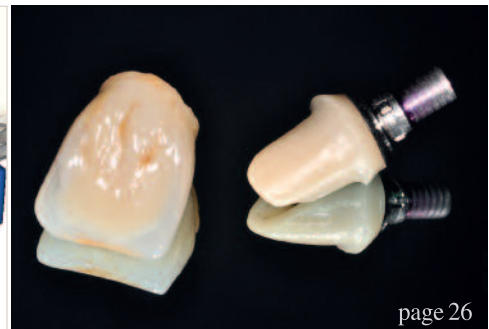
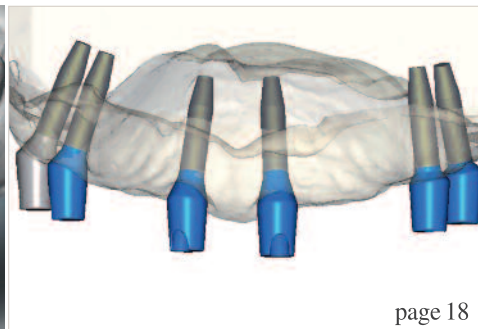
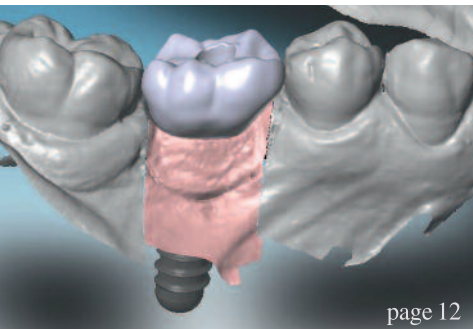
As we, clinicians, technicians, educators and researchers, look to advance dentistry in a modern technological world, let's keep the digital dentistry toolbox open to more tools. Let's always pose the question 'why' and try to find a solution to ongoing problems. Let us keep the aspect of accessibility in mind, with the development of open-source and affordable technologies. Lastly, let us merge our knowledge, skills and experience with the tools of digital dentistry to propel our profession as leaders in healthcare simulation.

Yours faithfully,

Dr Les Kalman




Dr Les Kalman



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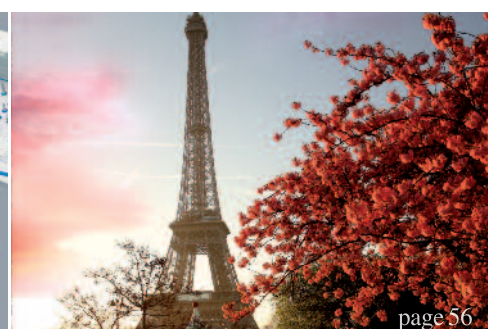
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Cast mounting using MaxAlign: The clinical component

Author_ Dr Les Kalman, Canada



Fig. 1_Inaccurate mounting.

_Introduction

The importance of records cannot be overstated. Records are a legal requirement, are vital

in assisting with diagnoses, and facilitate treatment planning, patient comprehension and laboratory communication.^{1,2} The clinician has the choice between virtual or tangible records, which may include casts, a facebow, articulation and photographs.^{3,4} Accurately mounted diagnostic casts provide an immense amount of information for treatment and that information will have an impact on the final prosthodontic plan.⁵

Just as the correct mounting of casts provides valuable information, so too does incorrect mounting provide inaccurate information. In addition, incorrect mounting may result in false diagnoses and possibly even altered treatment plans, based on errors in inter-arch space, occlusal contacts and force directions (Fig. 1).⁵

Laboratory communication with the clinician remains an important aspect, yet this has been



Fig. 2

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Fig. 3_Patient information.

Fig. 4_Tablet stand.

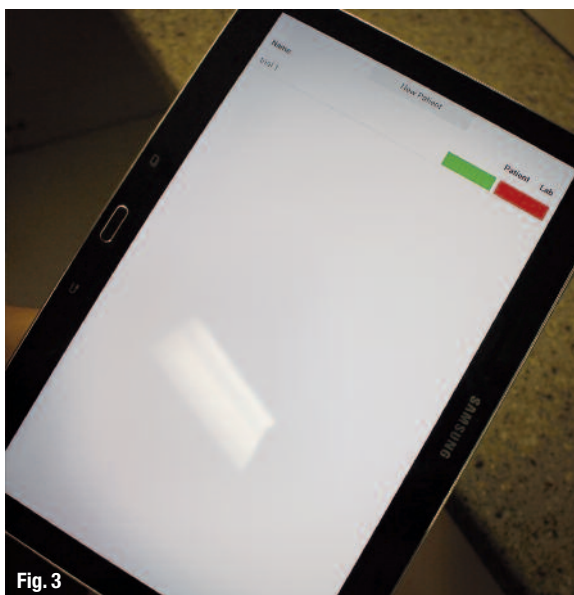


Fig. 3

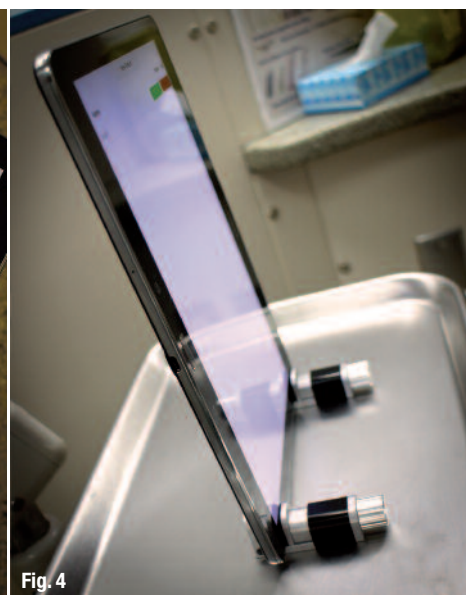


Fig. 4

lacking.⁶ Without records, communication with the laboratory can be even more limited. Communication tools must be employed^{7,8} to provide information so that laboratory technicians can satisfy laboratory requisitions. Lack of information results in guesswork, assumptions and incorrect dental work that is ultimately returned to the dental laboratory.⁹

_Background: MaxAlign

The MaxAlign application (Max; Whip Mix) is a communication tool for the clinician that captures essential patient information. It is a tablet-based technology that offers a unique set of records, enabling the accurate mounting of casts complete with a patient image. Max provides a calibrated photograph with clinical information and a novel technique for the mounting of casts. This case report will explore the effective use of Max to acquire

clinical information that is vital for the laboratory, third-party insurance, the clinician and the patient.

_Clinical protocol

A healthy 36-year-old female patient with a non-contributory medical history presented for consultation regarding elective anterior aesthetic treatment. Records consisted of alginate impressions using stock trays, which were poured in JADE STONE (Whip Mix), and utilisation of Max.

The Max app was downloaded onto a Samsung tablet (provided) and launched (Fig. 2). Patient information was input (Fig. 3). The tablet was positioned in the tablet clamps (provided) and the clamps were tightened to ensure a vertical orientation (Fig. 4). The tablet must be placed such that the Samsung logo is on the right, so

Fig. 5_Patient-tablet position.

Fig. 6_Max capture mode.

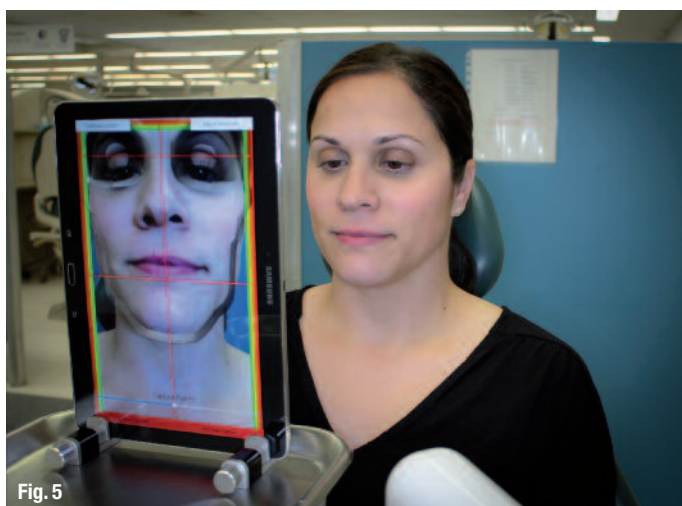


Fig. 5

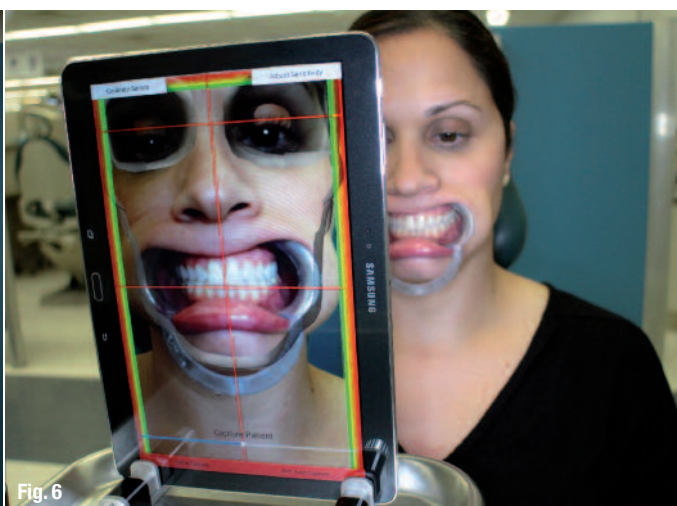


Fig. 6

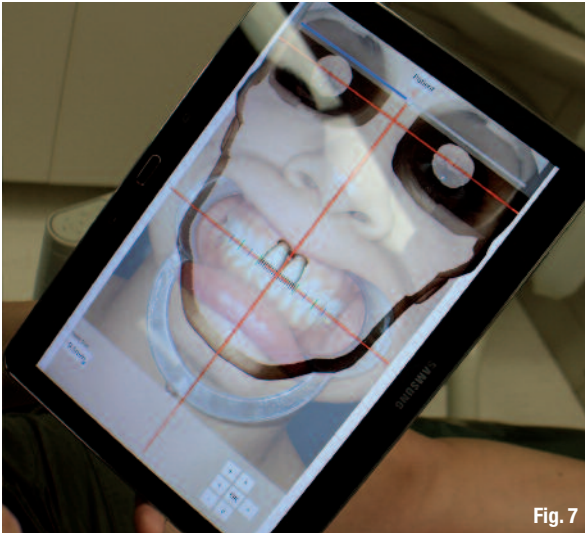


Fig. 7



Fig. 8

that the camera is located to the right. The patient was in the upright position, with the occlusal plane parallel to the floor, while the tablet was placed on the instrument delivery stand (Fig. 5). Max has anatomical guides for positioning: maxillary incisor midline and edge, location of orbits and inferior facial outline. The delivery stand was positioned close enough to the patient for her facial features to line up with the guides on Max (Fig. 6). Cheek retractors were employed to offer a clear view of the dentition (Fig. 6). Once the patient was in the correct position, the "arm auto capture" button was pressed. The tablet then captured a photograph, with a flash, of the patient (Fig. 7). Once the photograph has been taken, the clinician has the ability to maximise patient position by sizing or moving the image. The width of the central incisors can be selected from the boxes (Fig. 7). Once completed, the image is saved.

The next step is to verify occlusion. This was done with standard 8 μ shimstock while the patient is in maximum intercuspation (Fig. 8). The contacts were observed and input into the second Max screen (Fig. 9). This screen represents the quadrants of the dentition, and each box represents a tooth. In order to record occlusion, one touches the box that corresponds to the teeth contacting (Fig. 9).

The image and record of occlusion are saved and the operator has the option to exit the app or proceed with the laboratory component. If the mounting will be delegated to a laboratory, this concludes the clinical component of Max. The clinical information can then be e-mailed to the respective laboratory as a JPEG or PDF file. The laboratory would utilise the information according to the instructions in Max, as well as the peripherals, to mount a set of casts accurately (Fig. 10).

Fig. 7 _ Patient image.

Fig. 8 _ Recording occlusion.

Fig. 9 _ Inputting occlusion.

Fig. 10 _ Mounted case.

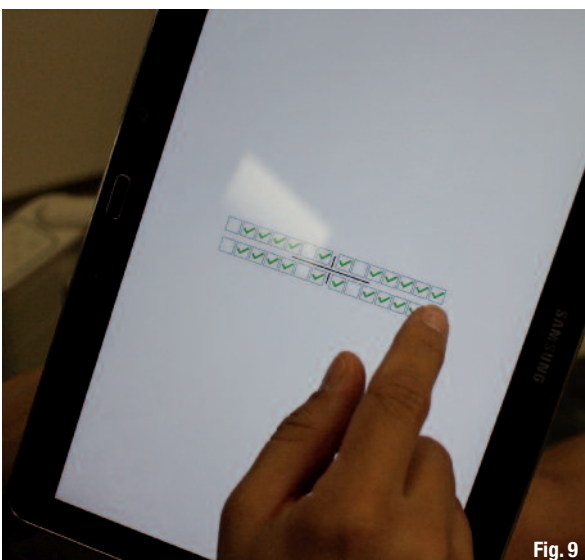


Fig. 9



Fig. 10