Guided implant surgical placement with Cad/CAM CEREC Crown

Nilesh R Parmar presents a surgical case study

Guided surgery has been around for a long time. However, very few dentists in the UK are placing implants via the use of a guided surgical procedure. The reasons for this are multiple, ranging from dentists not wanting to, or not having confidence in the procedures, the increased costs of guide fabrication and the time delay and extra appointments needed to obtain a fully working and reliable surgical guide.

In this case study I shall be demonstrating an in-house manufactured surgical guide using the CEREC AC BluCam. These guides do not require any impressions to be sent to a third party and can be made rather cheaply in the surgery within around 30 minutes. The guide can then be used in conjunction with specific drill keys, which are compatible with the guided surgical drill sets from all leading implant manufacturers. In this particular case the Astra/Dentsply Implants Facilitate system was used to place the implant.

Once the implant was osseointegrated the final restoration was fabricated chairside using the CEREC milling machine and an Ivoclar Vivadent e.max block.

Case Study
This young lady had lost her LL6 a few years ago and wanted an implant solution. Her medical history was clear and she had a mildly restored dentition with no current dental pathology. Her BPI, scores were low, with excellent oral hygiene.

The patient was scanned using the Sirona AC BluCam and a proposal for the missing LL6 was created. A Gallieos collimated lower jaw CBCT scan was taken with a CEREC Guide reference body set in thermoplastic over the edentulous area. The reference body is identified within the software and a virtual implant placement along with the CEREC crown proposal is all imported into the software. This allows the clinician to virtually place the implant, with reference to the ideal final crown position. In this case, it was deemed that a screw-retained restoration would be desirable; hence the screw access hole was positioned through the centre of the crown.

Once the implant position was decided, the information is ported over into the CEREC software and using a CEREC Guide Mill Block a drill body is milled by the MCXL milling machine. Once this has been milled it will lock tightly into the thermoplastic drilling template. The surgical guide is now complete and can be used on the patient.

In this particular case an Astra 4.0 x 11mm TX implant was placed using the surgical guide. The patient is prepared using a standard sterile protocol and the area anaesthetised as one would for a regular implant.
implant placement. The surgical guide snaps firmly over the existing teeth, expanding over and undercutts, becoming a very stable platform to drill through. The Astra Facilitate soft tissue punch is used to remove the overlying soft tissue, and a standard drilling protocol using the Sirona drill keys is used.

A high primary stability of 40Ncm was obtained, with a 4mm healing abutment placed immediately. The patient healed with no pain, no swelling and no discomfort. The post op LCPS corresponds well with the pre-surgical planning with an ideal angulation for a screw-retained crown. After two months of healing a fixture level open-tray impression was taken and cast up using an Astra Tech replica. A standard metal abutment was inserted into the replica and cut back by 5mm from the occlusal table. This was then powdered and scanned using the Astra BluCam and an Ivoclar e.max CAD C14 block milled. The CEREC 4.2 software was instructed to mill a hole that corresponds to the screw insertion path on the abutment. This is finalised using a high speed diamond bur with copious irrigation. The crown is glazed and sintered, allowed to cool and bonded to the abutment using Variolink II.

‘An implant can be planned, inserted and restored all in-house, using the current available technology’

This process shows just how far CAD/CAM technology has come. An implant can be planned, inserted and restored all in-house, using the current available technology. The final result is equal to any lab-based restoration albeit for simple units. The process does have its limits for multiple span bridges, and multiple implant placement, especially in edentulous areas. As the technology develops, with further advances being made, the scope of what’s possible for the implant dentist is always expanding.

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Dr Nilesh R. Parmar BDS (Lond) MSc (Prosth Dent) MSc (Imp Dent) Cert (Ortho) was voted Best Young Dentist in the East of England in 2009 and runner up in 2010. He was short-listed at the Private Dentistry Awards in the category of Outstanding Individual 2011. Nilesh has a master’s degree in Prosthetic Dentistry from the Eastman Dental Institute and a master’s degree in Clinical Implantology from King’s College London. He is one of the few dentists in the UK to have a degree from all three London Dental Schools and has recently obtained his Certificate in Orthodontics from Warwick University. His main area of interest is in dental implants and CEREC CAD/CAM technology. Nilesh runs a successful five-surgery practice close to London and is a visiting implant dentist to two central London practices. Nilesh has a never-ending passion for his work and is famed for his attention to detail and his belief that every patient he sees should become a patient for life. He offers training and mentoring to dentists starting out in implant dentistry, more information can be found on his website www.drnileshparmar.com.

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Fig 13: Standard abutment with 3mm of occlusal clearance

Fig 14: Soft tissue profile after 2 months healing

Fig 15: Cerec image of abutment

Fig 16: E-max crown glazed, stained and ready for sintering

Fig 17: Cerec image of block

Fig 18: E-max crown with screw hole

Fig 19: Milled E-max CadCam crown with screw hole

Fig 20: Screw retained E-max crown

Fig 21: Final restoration in situ 2

Fig 22: Final restoration in situ