Combining traditional and digital techniques

Kunal Shah walks us through an implant case using both traditional and digital techniques to get the optimum result

Dr Kunal Shah qualified from the University of Birmingham in 2011. He has since worked in general dental practice in London and Essex and strives to provide excellence in his dentistry.

A male patient in his mid 30s presented to the practice as a new attender. His main concern was a missing UL2, which he wanted to restore in order to enhance the aesthetics of his smile.

A comprehensive medical, dental and social history was taken. He had no relevant medical issues, was a non-smoker and was generally fit and healthy. The initial intra- and extraoral examination revealed no abnormalities, no existing restorations or dental work and good oral hygiene.

All possible treatment options for restoring the missing UL2 were presented to and discussed with the patient. These included no treatment, a denture, a bridge (likely a Maryland Bridge) and an implant-retained restoration.

The patient desired a fixed solution and so elected to proceed with a dental implant.

Treatment planning

A CBCT scan was taken with the CS 8100 3D (Carestream Dental) to assess the bone density and identify anatomical landmarks. This is important for accurate planning and therefore for predictable and successful treatment provision.

In this case, the CBCT provided two important insights. Some bone resorption was identified in the anterior region, which is crucial to be aware of as it could lead to gingival recession post-implant placement if not planned for and managed effectively.

Following the protocols for prosthetically driven implant planning (PDIP), treatment could be tailored in order to minimise the potential impact on the final aesthetic result.
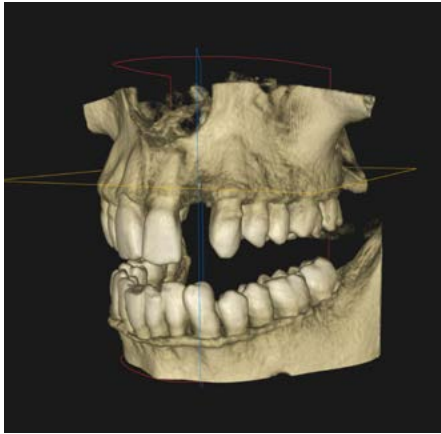
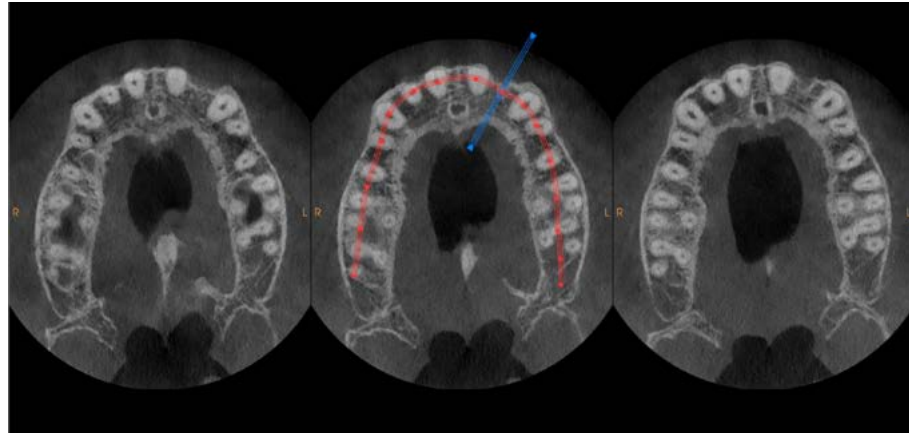**Figure 1:** 3D Render showing UL2 region from CBCT scan

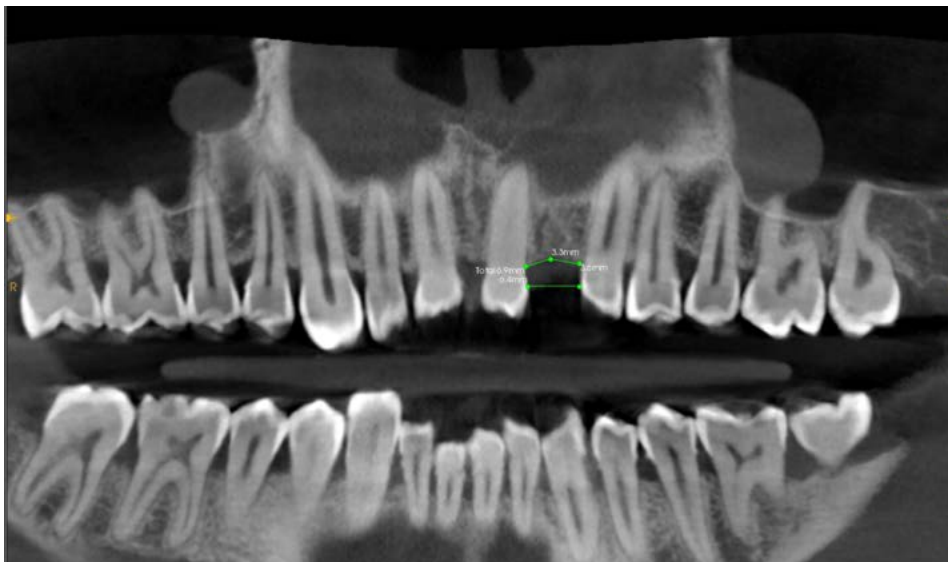**Figure 2:** Arch creation derived from CBCT scan

Figure 3: OPG derived from arch view and CBCT scan

We started by determining the ideal implant position and worked backwards to ensure the plan would deliver the desired outcome.

In addition, the CBCT scan demonstrated that the orientation of the UR1 and UL2 were buccally prominent. This meant that we could plan for the implant to be placed at a similar orientation in order to ensure that the masticatory forces would be transmitted along a straight line through the long axis.

A detailed conversation was had with the patient to ensure he understood the proposed procedure, the advantages, disadvantages and potential risks.

His responsibility in terms of maintenance and oral hygiene was also emphasised, and informed consent obtained. The pre-operative examination was completed and appropriate medication provided to the patient.
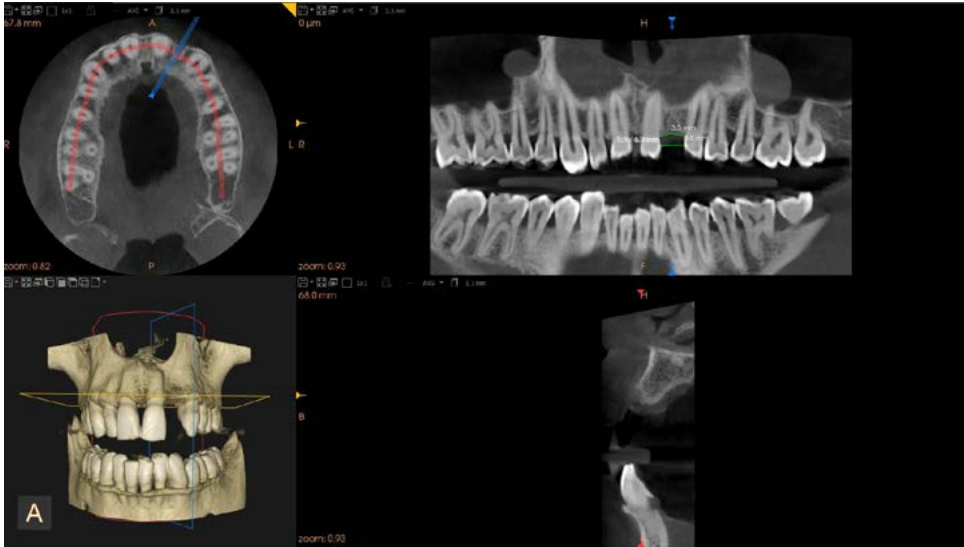
Figure 4: CBCT overall view one measured

Surgical treatment

The surgical appointment was unremarkable. Thanks to careful and accurate planning, everything went smoothly and as expected.

A bone graft was performed on the buccal plate to ensure a good emergence profile and therefore a more aesthetic outcome.

A 3.5mm x 10mm Replace Select CC PMC (Nobel Biocare) implant was then placed 1mm sub-crestally to further encourage superior aesthetics.

A cover screw was placed over the top and the implant was left to osseointegrate over the next four months.
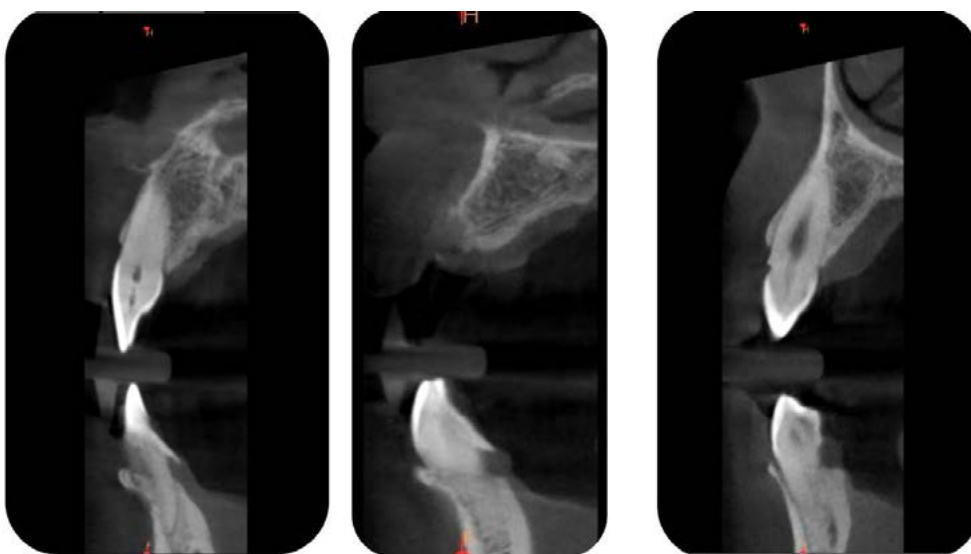

Figure 5: Sectional slice comparison

Sectional Slice UL1   Sectional Slice UL2   Sectional Slice UL3

Figure 6: PA UL2 showing placement of Nobel Biocare NP 3.5x10mm implant

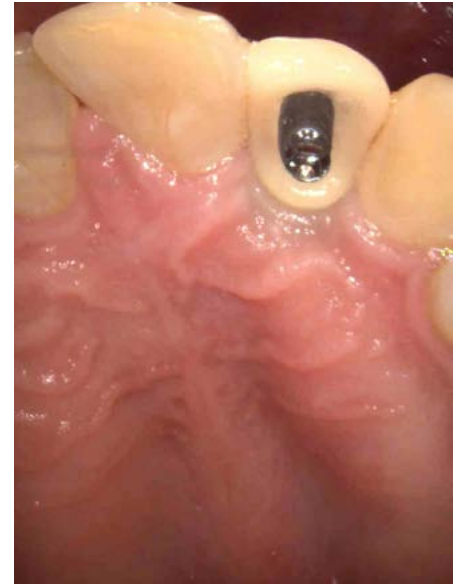**Figure 7:** Photo showing open spaced special tray impression using Impregum

Figure 8: IO photo showing screw-retained implant crown on initial seating palatal view

Restorative treatment

When the patient returned to the practice, the cover screw was removed and a healing abutment placed to improve the gingival profile.

An open-spaced special tray impression was taken using Impregum Polyether Impression Material in a medium body (3M Oral Care). The hydrophilic nature of this material means it accesses even the most intricate of areas. This, combined with its rigidity, ensures highly accurate detail replication and dimensional stability for a highly predictable workflow and top-quality restoration.

The impression was sent to the laboratory, who constructed a screw-retained PFM. This was seated and tried into the mouth, fitting easily first time. It was tightened to 25Ncm, and the access hole was covered with PTFE tape to protect the screw and sealed with a temporary dressing.

Two weeks later, the implant and restorations were reviewed. With no clinical or patient concerns, the temporary dressing was removed and replaced with composite to complete the final restoration.

Conclusion

The patient was delighted to have restored the space in his smile, which had been very visual in the anterior region of his mouth.

Figure 9: IO photo showing two-week review following seating of screw retained implant crown buccal view

Figure 10: Post-op PA showing implant and fully seated screw-retained implant crown

From a clinical perspective, the implant is well positioned, while good gingival contouring and consistency was achieved. The interdental papillae also filled in perfectly to optimise aesthetics.

For this case to be such a success, the planning was crucial. The CBCT scan provided the visualisation needed to know ahead of time what needed to be done. The combination of accurate surgical and restorative plans ensured good biological width for a highly aesthetic and natural-looking restoration, maximising patient satisfaction.

The impression material was also vital – its properties ensured the accuracy of the restoration for a stunning result and a simple workflow.

As such, this case demonstrates the effectiveness of a partial digital workflow. While the author commonly utilises a fully digital approach, certain cases can be completed very successfully with a combination of digital technologies and conventional techniques.

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