Carestream
DENTAL

CS 8100 3D

CBCT at Its Best

Kunal Shah, D.D.S.

Background

A healthy, 52-year-old female patient—with no relevant medical background, moderate previous dental restorations and generally good oral hygiene—had had LL6, LL7 and LR6 extracted 15-20 years ago. For the majority of that time, this loss in dentition did not impact her lifestyle. Recently, however, she was having issues with eating. The adjacent teeth were starting to drift and the opposing teeth on the other side were erupting, creating a functional problem rather than an aesthetic one. She was referred to LeoDental for potential implant surgery.

I discussed treatment options with the patient and the referring dentist, including: no treatment at all, bridges, dentures and implants. The patient opted for implants.

Treatment planning

We took a periapical X-ray with a ball bearing, as well as a CBCT scan with the CS 8100 3D. The first scan enabled the surgical team and me to assess the height of the bone, but the 2D image couldn't gauge the buccal-lingual aspect or the bone density.
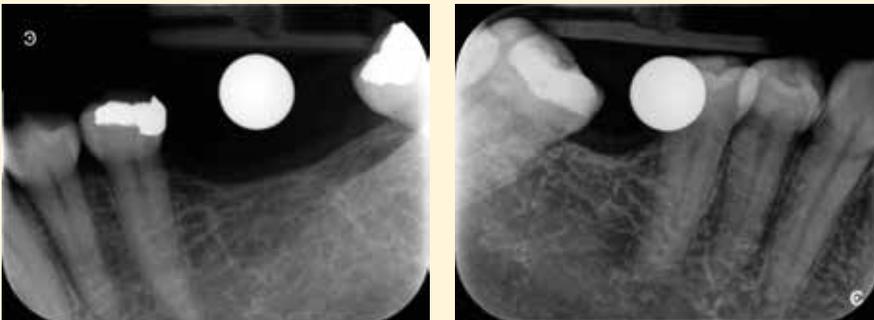
Pre-op periapical X-ray with metal ball for reference
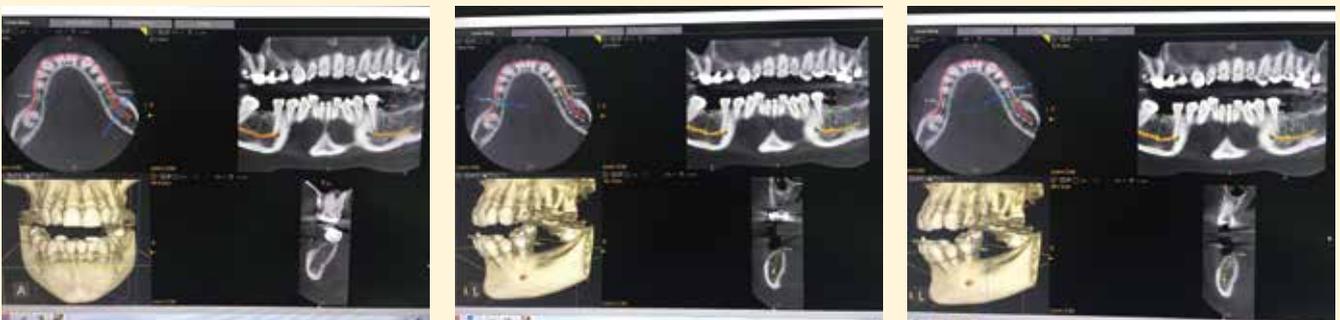
CBCT scan used for implant placement analysis

CBCT provided the 3D element, allowing us to:
- Track the depth from the crestal bone / bony ridge toward the nerve

- Assess the mesial-distal width present for placement of the LL6, LL7 and LR6

- Determine the buccal-lingual dimensions

- Account for the biological width

We were then able to calculate the vertical depth and nerve anatomy with high accuracy.

We evaluated the scans with the referring doctor and placed virtual implants on the X-rays. This exercise helped us to determine exactly where the implants should be placed, as well as the angulation, platform, length and type of implants required. We then took impressions using a single-stage wash putty technique and fabricated a study model and surgical stent with mock acrylic teeth. We practiced the surgery on the model, visualizing the implant position and comparing it to the virtual plan.

The goal of this upfront effort was to fine tune the treatment plan to minimize surgery time and associated risks. Based on my experience, I believe that the quicker the surgery, the better the primary stability and integration of the implant. From an aesthetic standpoint, a faster surgery also seems to lead to better gingival and mucosal healing, resulting in less future recession. Soft tissue is a key element for good aesthetics and the long-term success of the implant.

> *Dr. Shah prefers to work with the same surgical team—a surgical dental nurse and a highly experienced implantologist. As a result, the workflow is familiar and each procedure is very smooth.*

Implant placement

The surgery was a repeat of the virtual process the team performed during the planning stage. We raised a flap and followed the sequence of implant placement according to the manufacturer's instructions (Nobel Biocare implants, in this case). We placed the three implants in the pre-determined sites, fitted the healing abutments and closed the flap.

The LL7 was very difficult to access, but the surgery was simple because we had planned ahead and knew to use the extension elements available with the implant system for this position. We presented the patient with a post-op kit, which contained further information on caring for the surgical site, maintenance tools and any relevant medication.

Because the patient had already become accustomed to the spaces in her mouth, there was no need for temporaries in this case, which further encouraged good soft tissue healing with no occlusal load on the implant.

Follow up

During the follow-up appointment one week after surgery, the patient reported no pain and there were there no problems with the implant site. We allowed three to four months for healing before asking the patient to return for periapical X-rays, removal of the abutments, intraoral scanning to reveal soft tissue healing and irrigation of the site. We took an impression using an open-spaced tray (customized for the patient by the lab) with the implant impression copings in place.

LL6, LL7 and LR6 following ~3-month integration

LL6, LL7 and LR6 with healing abutments following ~3-month integration

After two more weeks, the lab delivered the screw-retained restorations, and we fitted them. We chose shade A3 and took an impression of the opposing arch to determine bite.

Placement of screw-retained restorations

Outcome

By the end of treatment, the patient was delighted with the outcome. From the professional team's perspective, there were no complications or unexpected events, which we can attribute to both meticulous planning and the harmony with which our team worked.

Post-op periapical X-rays

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Dr. Kunal Shah is the Principal of LeoDental in Hendon, London. In this clinical case study, Dr. Shah demonstrates the integral role that the CS 8100 3D imaging system played in delivering predictable treatment and the very best outcome for the patient.

To learn more about how the CS 8100 3D can benefit your practice, go to **carestreamdental.com**.