Beneficial to patients and providing unparalleled results, dental implants are more frequently being provided to patients.\(^1\) Whether completing the procedure for themselves or referring to a specialist, it behooves dentists to offer implants as a treatment option (when indicated) to provide the patient with the best in function, longevity, and aesthetics. Innovative implant technologies—combined with advanced diagnostics, a team-oriented approach, and proper case selection—have made implants a more viable option than ever in the general dental practice.\(^1\)

Implementing Dental Implants

Although implants can be completed in the general dental practice, implementation is incumbent upon having the proper systems in place, including specific team member roles, diagnosis and treatment planning protocols, and diagnostic and restorative material technology.\(^1\) Additionally, proper case and treatment selection is necessary when providing implants, specifically whether treatment will involve a single tooth, a partially edentulous or fully edentulous patient, or placing fixed and removable restorations.\(^2\)

Team Members

Placing implants requires a team approach that involves the surgeon, the laboratory, and the patient in order to decide and plan the ultimate outcome and how it will appear.\(^3,4\) By combining the knowledge, experience, and talents of each dental specialty, the highest quality of care can be provided to the patient, while communicating openly with other dental team members ensures the best aesthetic, functional, and long-lasting results can be achieved.\(^3,4\)

Diagnosis and Treatment Planning

To ensure the most predictable and ideal result for the patient, the diagnostic and treatment planning protocol used is of utmost importance. Diagnostic models, digital radiography, and computed tomography (CT) scans should be incorporated to plan implant placement, ensuring that sufficient, stable bone exists and that where the implant is placed will promote optimal retention.\(^5,6\)

In general, the key to successful implant placement is starting with the end result in mind. This is incumbent on
upon the incorporation of proper diagnostic tools and protocols, along with comprehensive treatment planning. Planning first begins by envisioning the completed implant case. Once the restoration is envisioned, the case should be sent to the laboratory for completion of a diagnostic wax-up to confirm that the anticipated results can be achieved. After confirming the case with the laboratory, provisionals can be fabricated to “testdrive” the restorations and evaluate the overall function and aesthetics.

**Diagnostic and Restorative Materials**

Many innovative diagnostic and restorative materials and tools are available for use to provide predictable and excellent clinical results. For example, panoramic radiography (such as Panorex) and digital radiography allow us to capture many measurements; however, they are only 2-dimensional and there is a 20% to 25% distortion rate with the panoramic technology. When completing precise measurements for implants, this distortion is a cause for concern. Therefore, an additional diagnostic technology should be used in conjunction with digital radiography. Innovative and advanced, cone beam (CB) CT demonstrates zero distortion, enabling dentists to measure the exact width and depth of hard tissues. Providing a 3-dimensional (3D) image, CBs allow dentists to view cross sections and all other aspects before starting treatment.

Innovative diagnostic software programs have also become available, which allow dentists to take diagnostic information and place it into the software program to virtually plan the case. Furthermore, these programs allow the dentist to pull through a library and choose the exact implant size required. With the ability to rotate the case 3-dimensionally, the entire case can be viewed and the final result confirmed. Overall, these programs provide invaluable information during treatment planning.

**Case Report**

**Diagnosis and Treatment Planning**

A 33-year-old male presented with retained primary upper left and right lateral incisors, which functioned well up to the time of treatment, when they
were failing (Figures 1 to 3). In cases of congenitally missing teeth, it is often necessary to extract the affected dentition and place implants. This was the treatment selected in this case, and the teeth would be atraumatically removed and implants placed. A technique to immediately provisionalize the implant was also chosen to reduce the amount of time the patient would be without some type of restoration in the affected areas.

A panoramic radiograph was taken first, which provided some information on the case. A CB scan was also taken (KODAK 9000D [Carestream Dental]) (Figure 4) to provide a clearer view of the patient’s dentition and bone structure. Additionally, with the assistance of iMagDent (iMagDent)/SimPlant (Materialise Dental), a 3-D software system, a digital mock-up was created that could be shown to the patient to allow him to see what treatment would be done, why it would be done, and what was required to complete this procedure (Figures 5 and 6).

Figure 1: Preoperative close-up view of the patient’s anterior teeth Nos. 7 to 10.

Figure 2: Close-up view of tooth No. 7; a primary tooth to be extracted and replaced with an implant.

Figure 3: Close-up view of tooth No. 10; a primary tooth to be extracted and replaced with an implant.

Figure 4: View of the preoperative cone beam computed tomography scan used during implant treatment planning.

Figure 5: Facial view of the SimPlant (Materialise Dental) plan developed for treatment planning purposes.

Figure 6: Occlusal view of the SimPlant surgical plan.