A revolutionary paradigm shift in dynamic surgical navigation

By George Mandelaris, DDS, MS

A revolution in surgical guidance is afoot. A new dynamic navigation technology called “Trace and Place” (TaP for short), was developed by ClaroNav and will soon become available with its Navident system. I have had the opportunity to try the technology in a range of cases, and I am very impressed. Here’s a brief description of my experience.

Registration is accomplished using any recent CT scan of the jaw by selecting on-screen and then tracing three of the patient’s teeth or other structures (such as braces or abutments). The process is done in the chair, immediately before surgery. No stent or guide needs to be prepared, and the entire registration process is typically accomplished in about three minutes.

In the rare case something goes wrong during registration and an accuracy check fails to demonstrate the accuracy expected, the registration can be immediately repeated by tracing the same or other structures.

Once the jaw is registered with its CT scan, on-screen guidance of the drill position and orientation is provided. The jaw surface is fully exposed, just like with free-hand drilling.

Because the jaw often moves during the operation, the system continuously tracks the position of the jaw and adjusts the registration to keep the jaw and its on-screen image in accurate alignment. Tracking the upper jaw is accomplished using a special head-tracking frame, which is not affected by movements of the lower jaw or changes in facial expressions.

Tracking the lower jaw is accomplished by connecting a lightweight plastic “jaw tracker” part, marked with optical targets, to a single tooth using a light-cured composite. The motions of the drill are tracked using another plastic part marked with optical targets.

After only a short experience with Trace and Place technology in my practice, I have come to believe that it is a real tipping point for dynamic navigation guidance. It has streamlined and simplified the workflow in both the diagnostic and surgical phases to allow state-of-the-art technology to be an everyday component of my surgical implant practice. I can’t imagine going back!