The evolution of sinus lift techniques

By Andrew Kelly, DDS

When Dr. O. Hilt Tatum performed his sinus lift technique in 1975, I wonder if he had any idea of how it would evolve or the controversies that would surround this procedure. I can say there exist as many techniques as there are opinions on how the procedure should be performed and who should perform it.

A sinus lift is a surgery that adds bone to the maxilla in the area of the molars and premolars. It’s sometimes called a sinus augmentation. The bone is added between the floor of the maxillary sinus and the Schneiderian membrane. To make room for the bone, the sinus membrane has to be moved upward, or “lifted.” Any dentist who is trained to do it can do a sinus lift. Tatum, the originator of the procedure, is a general dentist.

There are two basic methods for performing the sinus lift technique. The first method is the lateral window technique, which was described by Bone in 1960. The procedure was used by Bone to achieve an optimal intercrestal distance needed for denture making.

The sinus lift techniques have undergone numerous modifications through the years. In 1975, Tatum was the first to perform the lateral window technique in conjunction with autogenous bone grafting for the purpose of placing dental implants in the newly formed bone. Although the lateral window technique is highly invasive, it is a necessary procedure. In 1994, Summers, who was in pursuit of a less invasive sinus lift technique, made the surgical protocol easier by offering the crestal approach or osteotome technique.

Initially, the osteotome technique was used for compressing the soft maxillary bone to improve primary stability of implants and to increase success rates of implants placed in the posterior maxilla. After a period of success using the technique for bone compression, Summers started dilating the sinus, thus increasing the length of his implants. When the technique was first introduced, there were two significant disadvantages that limited this technique’s indications.

The first disadvantage was the limited height that the sinus could be raised. Initially, Summers was able to successfully lift the membrane 1–3 mm. The second limitation was the inability to directly visualize the membrane. The technique was initially performed with convex osteotomes by using the sinus floor to lift the membrane. After the membrane is lifted, bone grafting material is the used to hydraulically lift the Schneiderian membrane. Today, using modern technologies such as piezoelectric units and balloons as well as crestal approach kits, which use saline, we are now able to achieve that goal with the lateral window technique, with little concern for membrane perforation.

So where are we today? Very few practitioners, including Tatum, routinely use autogenous bone for sinus augmentation. One of the main reasons is there are several excellent alternative bone-grafting materials available that don’t require a secondary surgical site and provide very similar results to autogenous bone. So one question that is being asked a lot lately is: Is autogenous bone the “gold standard”? The jury is still out, but there is a lot of evidence out there that suggest it is not. Only time will tell.

The lateral window technique is being used more sparingly these days. There are several methods available that have allowed us to effectively raise the Schneiderian membrane 5–7 mm or more routinely and place the implant simultaneously, as long as we have enough crestal bone to get primary stability. This technique is safer for the patient, and it reduces the chance that an infection will occur.

Lastly, with the evolution of safer and more predictable sinus lift methods, more dentists are able to successfully perform the procedure, which allow more patients to have implants in the posterior maxilla.

Implant dentistry is a discipline that requires the practitioner to possess a wide range of skills. As the technology improves, it will open the door to a wider dissemination of implant dentistry into our society and help to increase the quality of life for many patients that need our help.

Technology will never replace knowledge and skill, however, it can and will lower the learning curve and help more practitioners provide state-of-the-art services to their patients.