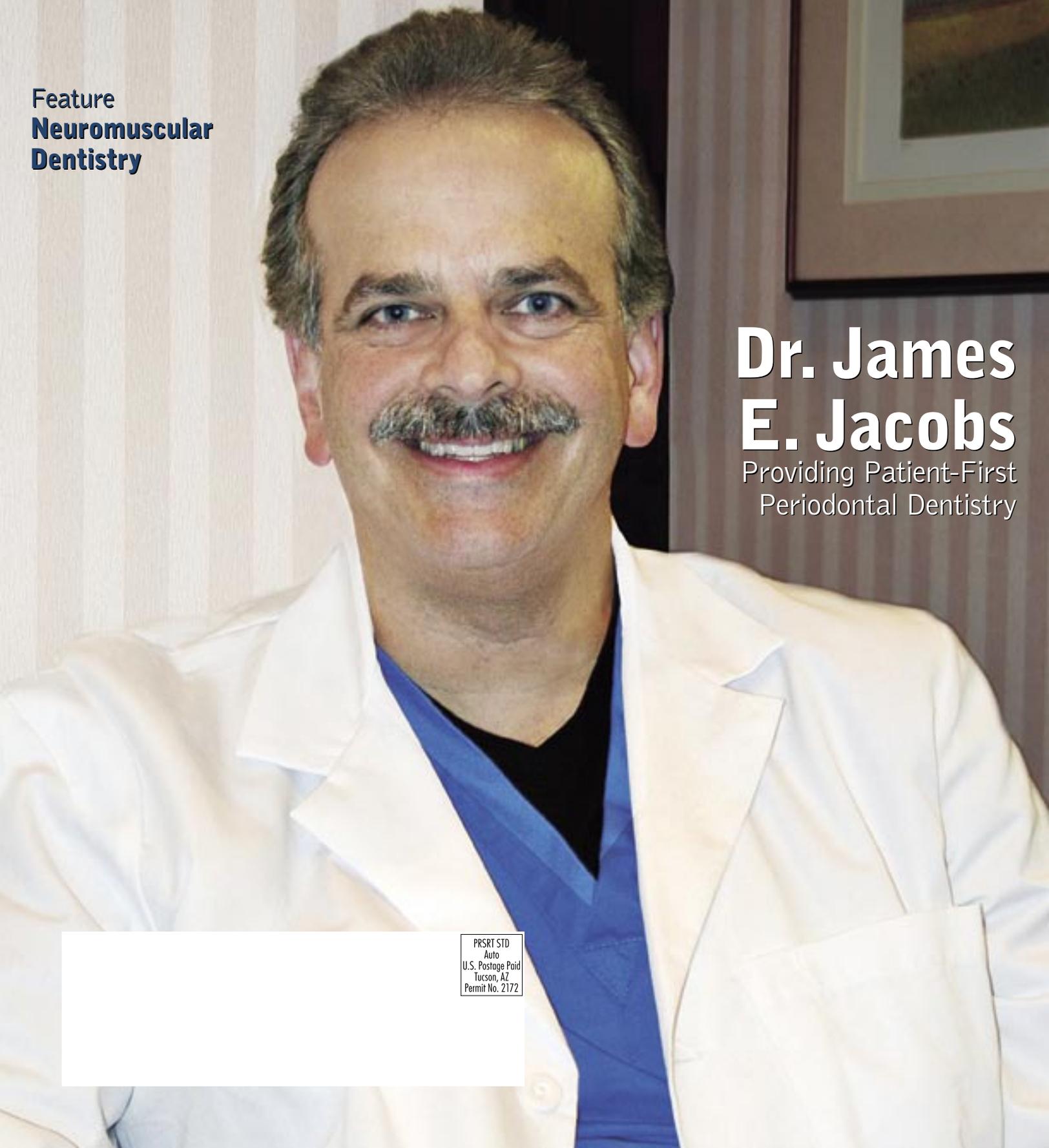


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Fixed Bridge for Excessive Maxillary Bone Loss

By Andrei Mark, D.D.S., Board-Certified Oral and Maxillofacial Surgeon

Recently, a 56-year-old male complaining of a loose-fitting upper denture and a failing mandibular bridge came into my office for a consultation. The clinical exam revealed a very poor-fitting maxillary denture with approximately 10 mm of vertical bone loss. The lower bridge was loose and the patient was at a point where he really wanted to have something done to improve his situation. A cone beam i-CAT scan was taken and revealed, as predicted, a limited amount of vertical bone in the maxilla (see images). In this regard, the i-CAT has proven to be an indispensable tool for evaluating and treating all my dental implant cases.

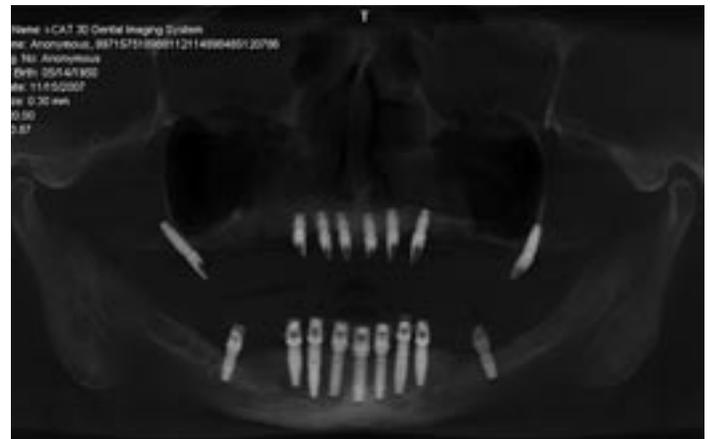
The mandibular bridge showed a full roundhouse bridge supported by teeth Nos. 21, 22, 27 and 28. Even though teeth Nos. 27 and 22 were not hopeless, I decided to extract all the remaining teeth and fabricate the final prosthesis with a fixed, implant-supported roundhouse bridge without any natural teeth remaining. Experience has taught me that whenever natural teeth are mixed with dental implants, you lose some of the predictability of the case. This is due to future failure of the natural teeth. Another reason not to save one or two natural teeth is to provide the patient with the best aesthetics possible and not be forced into following misaligned teeth. Fewer implants are required when using a one-piece, implant-supported, fixed roundhouse bridge than if we use multiple implant-supported units interspersed with a couple of natural teeth. Statistically, a natural tooth in poor shape is much less predictable than an implant-supported restoration.

The solution was to extract the remaining lower mandibular teeth and place eight implants with an immediate roundhouse fixed temporary restoration. Upper and lower impressions were taken for mounted casts, and a roundhouse mandibular temporary was fabricated based on the existing dentition. This temporary was designed as a full trough rather than with individual holes for each implant. They were relined at the end of the surgical phase to fit over the posts that were placed in the implants. This way, it allows for some leeway in the placement of the implants and the alignment of the posts, to provide a proper fit of the new temporary roundhouse bridge.

At the time of surgery, local anesthesia was obtained in the usual manner, and a full-thickness mucoperiosteal flap was elevated from the right second molar to the left second



Pre-op scan



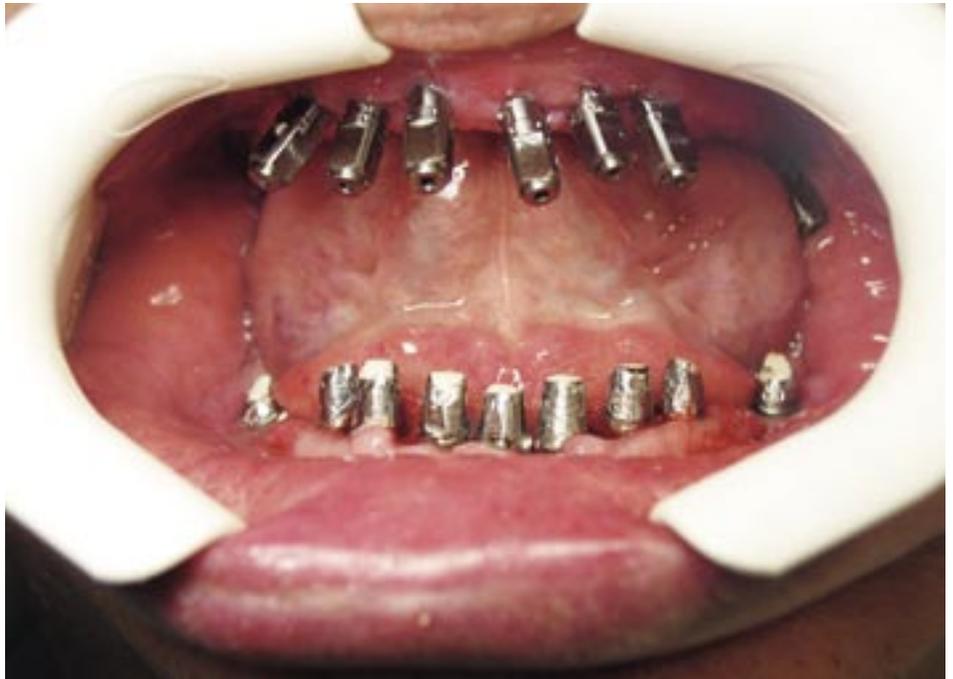
Post-op scan

molar. This incision is always chosen in order to divide the keratinized mucosa evenly, assuring adequate keratinized gingiva to the buccal and the lingual of the implants. This method helps with long-term maintenance, avoids gingival erosion and allows for better bone maintenance around the implants. The teeth were extracted, and osteotomies for nine implants were performed. I typically place an extra implant if the bone is available, as insurance against future failure. This way, even if we have a failure, we still have the minimal number of implants required to complete a full roundhouse restoration, without having to delay the case and perform

additional surgery. After placing all the implants with a final torque of 40 N or more, I decided that they were strong enough to be loaded immediately in a splinted fashion. Off-the-shelf abutments were chosen and placed into each implant with a torque of 30 N. Then, parallelism was observed and minor preparations were performed to these abutments, in order to have a passively seated temporary roundhouse bridge. The previously fabricated shell of the mandibular teeth was used to form new mandibular bridgework. Self-curing acrylic was poured into the form, and then the form was seated over the nine abutments. The patient was then instructed to lightly bite into occlusion. Before the acrylic set rock solid, I removed the temporary and resealed it several times, in order not to lock on to the implants. This step is *very* important, and a small error here can become catastrophic to the case. The patient was tired, so we chose to do the maxillary implants at a later date.

Approximately one month later, the patient returned for the maxillary implants. Due to the patient's low-lying sinuses, the treatment plan included pterygoids implants to be placed bilaterally. Yes, I could have done a bilateral sinus graft, but that would have extended the case another six months. However, by using pterygoids implants, we were able to eliminate the sinus lift and proceed with the case in three months. This can be achieved in cases where we have a full roundhouse bridge that is cross-arch stabilized. The bioengineering involved in cross-arch stabilization shows that angled implants are axially loaded and can tolerate function as well as vertical implants. Nine implants were placed in the maxilla. The No. 12 implant failed during the healing phase, so the final restoration was completed with eight implants instead of nine. This example highlights the theory of placing an extra implant as a safety measure, in case of failure.

The prosthetic challenges of the maxilla are to reconstruct not



Completed implants (BioHorizons)



Temporary restorations

only the teeth, but also the soft and hard tissue components that are missing. One must establish the proper vertical dimension and lip support, and then completely fill in the void between the incisal edge and the residual alveolar bone. This can be achieved with a hybrid denture or porcelain-fused-to-metal restoration, using pink porcelain. This concept will be discussed in greater detail in future articles. The patient is currently awaiting his final porcelain-fused-to-metal restorations to complete the case.

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