



IN THIS ISSUE

Page 1

Implant Overdenture Techniques Drastically Improve Patients' Quality of Life

Timothy Kosinski, DDS

Page 8

Precision Guided Dental Implant Placement

Frank Orlando, DDS

Page 11

Tidbits



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Implant Overdenture Techniques Drastically Improve Patients' Quality of Life

Timothy Kosinski, DDS

What do we do for our patients who have lost all their maxillary or mandibular teeth? Denture construction is of course conventional, but what about our patients' quality of life, chewing effectiveness and efficiency? With the advent of predictable dental implant surgical placement with fantastic long term prognoses, and prosthetic components providing stable retention that are reasonable in cost, we can now easily provide support for a patient's dentures. These implant retained overdentures are an outstanding alternative to conventional dentures.

Fabrication of stable, comfortable maxillary and mandibular removable complete dentures using dental implants as the support mechanism begins with careful diagnosis and case planning. Often simple two dimensional images created using conventional digital radiographic techniques are appropriate to determine vertical height of available bone. However horizontal bone quantity must be determined by other means.

The surgeon's experience and manual placement techniques greatly influence the final functional and esthetic result. Any laboratory technician can tell you that often implants are placed in poor position or angulation making prosthetic fabrication difficult or retention compromised.

CT Scanning

CT scanning techniques have improved our diagnostic abilities dramatically, allowing the practitioner to visualize all dimensions of the edentulous bone contour. Quantity and quality of bone can often be determined prior to any surgical intervention. CT guides can be used to create a three dimensional image which allows us to create a surgical guide to be used for proper directional an-



Fig. 1: Patient presented with no maxillary or mandibular teeth but with a desire to increase form and function and improve his quality of life.



Fig. 2: Pre operative panoramic radiograph illustrating the position of the vital anatomy including the maxillary right and left maxillary sinuses and the mandibular canal and mental foramen.

gulation of our implants, or taken to a higher level, actually be used to create a surgical guide which will allow precise depth placement of our implants. This is wonderful technology.

Endosseous implants with appropriate prosthetic retention designs serve as reliable retainers for overdentures and have proven to provide a long-term prognosis. There is an increase in quality of life that is rewarding to the dentist and gratifying to the patient.

Case Study

Our patient is an 80 year-old male who presented to our office never having any type of dental appliance. Remarkably, he had no significant medical contraindications to dental implants and was on no medications. His teeth were removed about a year prior to our evaluation of the edentulous maxillary and mandibular ridges [Figs. 1-3]. Our patient learned about dental implants from his family, and since he was now a bit more secure financially, decided that it was time to "have some teeth."

Options were discussed including fabrication of conventional maxillary and mandibular dentures, but the decision was made to place four maxillary and four mandibular implants to secure implant retained overdentures using the Locator system. This process would be a cost effective means to restoring form and function and improve esthetics dramatically.

Bone

The amount of anterior pre-maxillary bone was determined with conventional radiographs and bone calipers, which helped determine width of bone in the surgical sites. Placement of implants in the posterior maxilla would be hindered by the size and position of the right and left maxillary sinuses. There was significant facial resorption in the maxilla, so it was determined that an implant retained maxillary overdenture with proper lip support would best serve the patient. The mandibular bone had nice quantity vertically and horizontally.

Parallelism

It is imperative that the implants used to retain an overdenture using Locator attachments be placed as nearly parallel in all three dimensions, as possible, to the long axis of the bone and to each other.

Clinical Procedure

Because of the perceived amount of bone in the maxilla, a 2mm wide pilot drill was used to penetrate the maxillary bone [Fig. 4], right through the tissue. A radiograph was made to insure that we were anterior to the maxillary sinus area. Positioning and angulation of this pilot drill was done through experience and looking closely in various positions.

The OCO Biomedical implant system was chosen because of its high quality, incredible initial stabilization and simple prosthetic applications. The OCO Biomedical ERI two piece dental implant system has a body design of mini cortico-thread pattern at the top of the implant that locks into the cortical bone, and a bull nose, "auger" design at the apex, that actually condenses bone around the tip and threads. The OCO Biomedical dental implant design is a minimally invasive bone condensing implant system designed for dual stabilization of the implant in place to provide a true mechanical lock.

The surgical technique in the placement of the ERI implant is both user friendly and simple. Chairside surgery is dramatically reduced due to the simple staged surgical drilling. As the cost of implant materials decreases, my ability to provide high quality dentistry at a reasonable fee increases. Our patients are very responsive to this and appreciative. Once I determined that the angulation of the first osteotomy was proper, I would move forward.

My first intention was to do this procedure using a flapless technique, but after the first pilot osteotomy was done, I did not feel completely comfortable in knowing precisely the amount of bone that I had available. Certainly a CT would have helped in this diagnosis, but I did not have one.

Placement

I then decided to make a 1.5 inch incision on the right and left crestal tissue to flap the tissue, so I could correctly visualize the available bone. The final 3.5mm diameter osteotomy drill is used to create a site for the 4.1mm diameter implant, which is threaded into



Fig. 3: Maxillary and mandibular edentulous ridges seem to indicate adequate height and width of bone to surgically place four maxillary and four mandibular implants to support implant retained overdentures.



Fig. 4: A 2mm pilot drill was used to determine proper angulation and availability of bone. It was determined that a flap should be made to visualize the available bone and bone contour prior to proceeding.

position using a torque wrench. You can see that 35Ncm of torque is achieved with the implant system even in the relatively soft anterior maxillary bone [Figs. 5-6].

Once the first implant is deemed to be positioned correctly, the other implants are simply paralleled to the first. Four maxillary implants are ideally placed. The tissue was then simply sutured closed using Vicryl Vicryl sutures which were removed the following week [Figs. 7a, 7b, 8].

Four mandibular implants were placed using a flapless technique and thus healing occurred more promptly [Figs. 9-13]. Conventional denture techniques were used to create the final esthetic contours. We created an outstanding functional and esthetic result, exceeding the patient's expectations and totally eliminating the gagging reflex that a full palate conventional denture could create.

Because the implants were properly positioned, Locator attachments (Zest Anchors, www.zestanchors.com) were torqued into each implant and a palateless maxillary overdenture was fabricated [Figs. 14-20]. The mandibular implant retained overdenture was fabricated in a likewise manner. The Locator attachments provide excellent stability, and because the implants were spaced ideally, excellent retention was achieved.



Fig. 5: Following proper flapping of the soft tissue and final osteotomy creation, an OCO Biomedical implant is threaded into place.



Fig. 6: The second implant site is prepared parallel to the ideal position of the primarily placed implant.



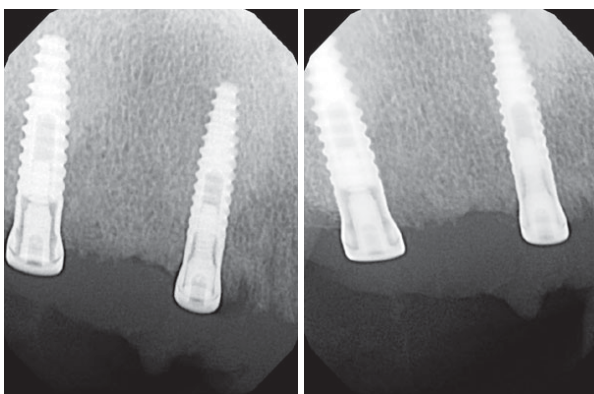
Figs. 7a-7b: The four maxillary implants are placed and healing abutment threaded into the body of the implant. The sites are sutured using Vicryl.



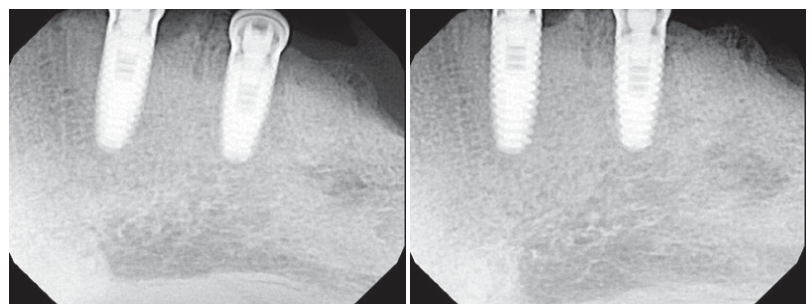
Fig. 8: Following about a week of healing, the sutures are removed.



Fig. 11: The mandibular implants were ideally positioned using a flapless technique, so healing progresses much faster with little discomfort to the patient.



Figs. 9-10: Radiographs illustrating the position of the four maxillary implants.



Figs. 12-13 : Digital radiographs of the paralleled mandibular implants.

Because of their design, the patient was able to easily align and seat his overdentures. It was important, however, that the implants be placed in a parallel position to each other, to simplify the prosthetic construction. According to the manufacturer, the attachments resist wear and maintain satisfactory retention for up to 56,000 cycles of function. The male portions can be easily changed chairside with minimal inconvenience to the patient.

Locators

The Locators come in a variety of retentions from extra light (blue) to heavy (clear). In this instance, the light retention attachments were used. The patient's chewing function and efficiency, as well as his quality of life, were dramatically improved using simple, easy to follow, cost effective dental surgical and prosthetic techniques. The attachments are easily maintained intraorally with brushing or a simple wipe with a washcloth. The underside of the denture is cleaned with a simple brush.

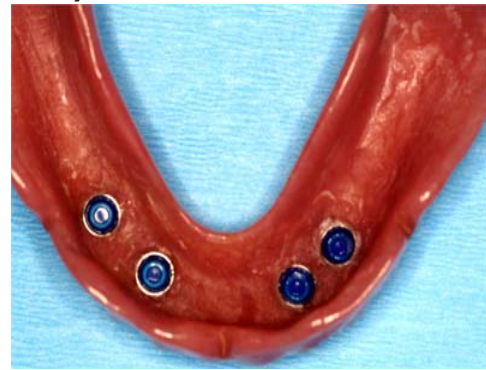
As general dentists we have an obligation to provide our patients with the most innovative, proven techniques available. CT scans and scanning software can make surgical placement of dental implants for the less experienced practitioner rather routine. Anatomic anomalies are virtually determined prior to ever touching the patient. With better implant placement, comes more routine and predictable prosthetic reconstruction.

Timothy Kosinski, DDS, MAGD maintains a private practice in Bingham Farms, MI with an emphasis on cosmetic and implant dentistry. He is an Adjunct Clinical Professor at the University of Detroit Mercy School of Dentistry, serves on the editorial review Board of Reality, and is a Diplomat of the American Board of Oral Implantology/Implant Dentistry, the International Congress of Oral Implantologists and the American Society of Osseointegration. He is a Fellow of the American Academy of Implant Dentistry.

Dr. Kosinski has published over 87 articles on the surgical and prosthetic phases of implant dentistry and was a contributor to the textbooks, Principles and Practices of Implant Dentistry, and 2010's Dental Implantation and Technology. He can be reached at drkosin@aol.com or 248-646-8651.



Figs. 14-15: After approximately 4 months of integrations, Locator attachments are torqued into the implants. The body of the attachment is about 1.5



Figs. 16-17: The male attachments are housed in the underside of the implant-retained overdentures.



Fig. 18: The maxillary implant retained overdenture is palateless making it more comfortable to the patient.



Fig. 19: The overdentures provide chewing efficiency and improves patient's form and function.



Fig. 20: The final smile design provides for a happy patient.