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The Singh Guided Pin Surgery system (Meisinger USA) was developed out of the need for a simplified and conservative surgical system for implant dentistry and to minimize the need for non-autogenous-sourced hard-tissue grafting material. The eventual benefit would be a faster and safer method to create an ideal osteotomy while simultaneously collecting and harvesting substantial volumes of autogenous bone for grafting purposes.

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Precise, safe and conservative bone harvesting and osteotomy technology

Abstract

The specific aim of this project is to evaluate and substantiate the effectiveness and simplification of the osteotomy creation process using the newly designed and engineered Guided Precision Surgical (GPS) Trephines drills for the purpose of placing a dental implant, while simultaneously collecting substantial volume of autogenous bone that otherwise would have been discarded during the current osteotomy creation method using sequentially enlarging diameter spade drills.3 Included is a case report on how these drills can be used to prepare an osteotomy for a crestal approach sinus lift while simultaneously using the harvested bone for augmentation.

Materials and methods

The current method of creating a receptor site for a dental implant results in severe trauma (destruction and loss) to the host bone in the process. Depending on operator experience and bone type, it is very possible to oversize the osteotomy resulting in a non-optimum fit of the implant, which can cause failure due to non-integration.
Occasionally, there is need for hard-tissue augmentation of the implant; however, harvesting autogenous bone from a secondary site is not without significant morbidity and risk.

This study was designed to compare osteotomy creation and simultaneous bone harvesting using the newly introduced GPS (Guided Precision Surgery, Meisinger) Trephines (Figs. 1, 2) vs. traditional osteotomy using spade drills.

Use of the GPS Trephines: 1) simplifies and streamlines the surgical placement of implants, 2) minimizes trauma to the surgical site by using fewer instruments while simultaneously collecting vital autogenous, and 3) enables the harvesting of autogenous bone from the osteotomy site eliminating/decreasing the need for a secondary donor site or the use of alternative bone-grafting materials. Additionally, autogenous bone, considered to be the "Gold Standard" in bone grafting, is invaluable in Guided Bone Regeneration and further decreases the costs of bone-grafting materials.

The GPS Trephine system was developed out of the need for a simplified and conservative surgical system for implant dentistry and to minimize the need for non-autogenous sourced hard-tissue grafting material. The eventual benefit is a faster and safer method to create an ideal osteotomy while simultaneously collecting and harvesting substantial volumes of autogenous bone for grafting purpose.

The system allows the implant surgeon to accomplish the preparation of an osteotomy for the placement of an implant in only two steps, utilizing only two surgical drills, irrespective of the implant system and size of the implant being used.

The system consists of a 1.3 mm pilot drill (two pilot drills are included as part of the system package, which function as guide and paralleling pins), five trephine drills with outer diameters of 4.0 mm to 6.0 mm in 0.5 mm increments (Fig. 3) and an autoclavable organizational bur block. The trephine allows for the capture of the bone block, 1 mm less in diameter (representing the internal diameter of the trephine) than the osteotomy (outer diameter of the trephine) (Figs. 4, 5).

The trephines have a parallel walled 1.3 mm central guide pin that protrudes 1 mm past the cutting ends and is flat (non cutting). The unique aspect of this system is that the entire trephine with the central guide pin is fabricated in one piece using CAD/CAM manufacturing out of a single block of high strength metal. The parallel walls of the guide pin allow the trephine to advance along the shaft left from the pilot drill, preventing misdirection, and the extended flat-ended pin allows the trephine to advance to the depth defined by the pilot drill. Once “bottomed out,” the trephine freely rotates around its central axis without risking extension of the osteotomy’s depth or width.

This was a primary study using dense plastic simulated bone model mandibles, from which the data obtained would be used to submit for an IRB-approved human trial. Ten simulated bone mandibles were used to conduct a quantitative analysis of the amount of simulated bone salvaged during the osteotomy creation process, five different proprietary implant system drilling protocols were used and compared to newly introduced GPS Trephine system and drilling protocol for the same diameter implants.

Each mandible was designated a control (right) side and an experimental (left) side, and each implant system was allowed two mandibles with a minimum of four osteotomy sites per implant diameter. The drilling was carried out in sequence as per the pro-
The five implant systems that were compared to GPS Trephines were: Screwline (Camlog, Henry Schein Inc.), Neoss, Osteotite – straight wall (BIOMET 3i), Screw-Vent (Zimmer Dental) and Replace Select (Nobel Biocare).8

On the control side, four osteotomies for each implant diameter per implant system were prepared to a depth of 10 mm as per the proprietary drilling sequence. On the experimental side, GPS protocol was used to prepare an osteotomy for the identical diameter implant of the system used on the control side (Fig. 7).

On the control side, the plastic bone from the flutes of the spade drills was collected per implant site and on the experimental side, the plastic bone collected from within the trephine or detached from the surrounding plastic mandible after the completion of the osteotomy for the implant was collected and weighted (Figs. 8, 9).

After implant planning and identification of the osteotomy sites as per usual manner and defined by standard of care:

Under copious external irrigation and at 750–1250 rpm depending on the type of bone, the pilot drill is first advanced to a depth that measures implant length + 1 mm, (e.g. for an 10 mm long implant, a 10 + 1 = 11 mm deep pilot hole will be created). An endodontic rubber stop can be used but is not necessary, as the pilot drill has laser cut markings at defined depths of 10 mm to 20 mm in increments of 2 mm to define that length.

A verification intraoral radiograph is taken with the pilot drill in place. If multiple side-by-side implants are being placed, then one pilot drill can be left in place to be used as a paralleling pin for the adjacent osteotomy.

A trephine is selected that has an outer diameter equal or no greater than 0.5 mm narrower than the diameter of the implant planned for the osteotomy, (e.g. for a 4 mm diameter implant, a 3.0/4.0 trephine will be needed, 3.0 mm is the internal core diameter of the trephine and will harvest a 3 mm diameter core of autogenous bone, 4.0 mm is the outer diameter of the trephine and leave a 4 mm cylindrical hole as the trephine only has end cutting edges and is not side cutting).

For a 4.8 mm diameter implant, a 3.5/4.5 trephine will be needed as the 4.5 outer core of the trephine is > 4.8-0.5 = 4.3 mm, this will allow a 3.5 mm core of bone to be harvested from the osteotomy site. Under copious external irrigation, the protruding pin of the trephine is introduced into the pilot hole and the cutting edges rested on the alveolar crest firmly.

Fig. 10. Class II mobility of tooth #4 and periodontal charting was WNL with no bleeding upon probing.

Figs. 11, 12. Radiographic examination of tooth #4.
The motor is set in a reverse mode at 500 rpm and activated for a few seconds until the end cutting teeth pattern has been created on the ridge. The motor is set back to forward setting and depending on the type of bone, under copious external irrigation at 750 – 1250 RPMs the trephine is introduced into the pilot hole and allowed to guide itself down the pilot hole until the trephine doesn’t advance any farther (bottoms out) and either stalls or spins around its axis.

At this time, the trephine is reversed out of the osteotomy, and the bone trapped inside the trephine is slid out using the pointed end of a periosteal elevator. If the core of bone is left inside the osteotomy, attached only at the base, the pointed end of the periosteal elevator can be used to free it by luxation and elevated out using a pickup or college forceps. Upon extraction, the core is best stored in either sterile water or sterile normal saline solution. The core can be used as a block graft and retained using bone screws or can be morcellated for use as a particulate graft.

The osteotomy is irrigated and visually inspected for integrity and the intended implant is inserted as per the insertion protocol defined by the implant manufacturer. It is always recommended that the few final turns be completed manually for tactile feedback as motorized insertion can apply exces-
sive load on the osteotomy walls and may cause the implant to “spin.”

The GPS osteotomy creation protocol is the same for tapered and straight walled implants. For tapered implants, the apical discrepancy between the implant surface and the osteotomy walls will be treated by the body as a five-walled defect and fill in naturally without any need for grafting.

Results

Please see the five charts (Charts 1-5) for exact results of 4.0 mm through 6.0 mm.

Discussion

The 4.0 mm GPS’s controls were 4.0 and 4.3 mm diameter osteotomies. The 4.5 mm GPS’s controls were 4.5, 4.7 and 4.8 mm diameter osteotomies. The GPS protocol consistently harvested more bone than any of the spade drill systems used for control. The most consistent volume harvested was seen in the larger diameter GPS trephines. This was most likely due to the ease of removal of the core from the larger diameters than the smaller ones. Of all of the control systems used, the most amount of volume was collected from the Camlog system, while the least amount collected was from Nobel Biocare’s.

Conclusion

From this study, it can be concluded that the GPS trephine system was not only able to create a perfectly sized osteotomy irrespective of the implant system it was compared with, it was also able to harvest bone in volume and weight more than two times that of the spade implant drills. Even though safety and speed were not part of the parameters being studied, it was observed that the osteotomies were created faster and with more precision using the GPS protocol.

Case report

A 35-year-old female patient presented for her regularly scheduled periodontal hygiene appointment and reported no change in her ASA1 medical status. She did, however, state that she had been experiencing occasional discomfort and swelling in the upper right premolar region and had been experiencing sensitivity to cold liquids as of the past several weeks, but she wanted to wait until her regularly scheduled appointment to have it examined.

Clinically, there was class II mobility of tooth #4 and periodontal charting was WNL with no bleeding upon probing (Fig. 10). There was tenderness to touch in the mucobuccal fold immediately overlaying tooth.
She admitted to not complying daily with the prescribed night guard as she suffers from sleep related bruxism (SB). There was tenderness to percussion to tooth #4, and upon radiographic examination (Fig. 11), it was concluded the tooth was non-salvageable. The treatment plan was to extract tooth #4 and allow socket and soft tissue to heal naturally and revisit the site in three months for implant placement (Fig. 12). At that time, enough sufficient soft-tissue healing and maturation had occurred (Figs. 13-16) to proceed with a crestal approach sinus lift and simultaneous implant placement.

The alveolar height was determined to be 8 mm from the base of the sinus floor, based on a calibrated PA radiograph (digital sensor, Sirona), and the plan was to place a 4 x 11.5 mm implant (Osteotite, BIOMET 3i).

At the time of implant placement surgery, 30 cc of whole blood was collected in 3 x 10 cc red top tubes and spun for PrGF.11 Local anesthesia was administered for pain control, followed by a mid-crestal incision extending intrasulcular, one tooth proximal mesial and distal to implant site on both palatal and buccal aspects was made and flaps reflected to

Figs. 20, 21. A 4.0 mm GPS trephine was then used to create the osteotomy as per the GPS protocol.

Fig. 22. The core of bone still attached inside the osteotomy.

Figs. 23, 24. After the removal, the core of the bone was crushed into smaller pieces and stored in PRP.

Fig. 25. A 6 mm deep osteotomy with a 2 mm apical core of bone attached to the sinus floor.
expose the buccal and palatal boney walls including the crest. The midpoint of the edentulous space on the crest was determined and a 1.3 mm diameter pilot drill with an endodontic stop was introduced as per protocol set for the GPS trephines, to a depth of 7 mm from the crest of the ridge (Figs. 17–19). A 4.0 mm GPS trephine was then used to create the osteotomy as per the GPS protocol (Figs. 20, 21), leaving behind the core of bone still attached inside the osteotomy (Fig. 22) and, after the removal, the core of the bone was crushed into smaller pieces and stored in PRP (Fig. 23, 24), leaving a 6 mm deep osteotomy with a 2 mm apical core of bone attached to the sinus floor (Fig. 25).

Using a matching diameter osteotome (Figs. 26, 27), the floor of the sinus is infractured and pushed up.

Fig. 26, 27. A matching diameter osteotome.

Fig. 28. The floor of the sinus is infractured and pushed up.

Fig. 29. PrGF membrane.

Figs. 30, 31. The newly developed sinus floor.
up (Fig. 28) to accommodate the 11 mm deep implant and the integrity of the sinus verified. One PrGF membrane (Fig. 29) was introduced into the socket and pushed up against the sinus floor to protect it from the bone graft being introduced into the osteotomy socket and pushed apically into the newly developed sinus floor by the motorized insertion action of the implant (Fig. 30, 31). The osteotomy crestal access was sealed with an additional PrGF (Fig. 32) before flaps closure with Vicryl sutures (Ethicon).

_Acknowledgement and disclaimer_

Dr. Singh invented the “GPS Trephine System,” which was developed with the assistance of engineers at Meisinger Instruments in Germany.

The authors wish to thank Dr. Burakoff, Dr. Stewart, and implant fellows and residents at North Shore, LIJ University Hospital for all of their hard work and commitment to the project._

 References


_about the authors_

**Dr. Pankaj Singh** received his doctor of dental surgery degree from New York University College of Dentistry and completed his residency and fellowship in dental/oral surgery and dental/oral implantology at Brookdale Hospital Medical Center in New York. He received an advanced certificate in IV anesthesia from Montefiore Hospital and Albert Einstein School of Medicine. He is an attending and research scientist in the Department of Dental Medicine and Oral Surgery at LIJ/NS University Hospital in Long Island, N.Y., as well as an associate professor in the International Dental Program Department at NYU College of Dentistry. For more information, visit www.archdental.com.

**Dr. Christine Chu** is a general dentist, with an emphasis on cosmetic and restorative dentistry. She received her bachelor of science in biochemistry from The State University of New York at Stony Brook and her doctor of dental surgery degree from the State University of New York at Buffalo. She completed her post-doctoral training in a general practice residency at the North Shore-Long Island Jewish Health System.
Immediate restoration of single implants replacing central incisors compromised by internal resorption

Authors_Susan McMahon, DMD, and Jessica Forestier

Central incisors with a history of past trauma are a common finding in dentistry today. Many of these incisors have been endodontically treated at the time of trauma or shortly post trauma.

However, failure of these teeth can occur at a later time as a result of fracture, internal resorption, external resorption, decay and other factors. Sources of trauma often include sports or automobile-related accidents.

Once it has been determined that an internally resorbed tooth is failing and non-restorable, a restorative treatment plan that is both functionally and esthetically acceptable must be determined and implemented.

The following are two case studies involving maxillary right central incisors that had sustained trauma, were endodontically treated and functioned for a number of years. Approximately 15 to 20 years later, the teeth in each case failed due to internal resorption.

Internal resorption

Dental root resorption involves the loss of hard tissues that compose the teeth (dentin, cementum and enamel). Resorption occurs primarily by osteoclasts, large multinucleated cells that originate from the bone marrow.

Osteoclasts aid in the process of bone loss by releasing demineralizing agents and degrading enzymes that function in the breakdown of a tooth’s hard tissues. Resorption of the teeth is often difficult to prognosticate, diagnose and care for.

In most cases, tooth resorption is the result of trauma or irritation to the periodontal ligament and/or tooth pulp. These conditions may occur because of injury, inflammation or chronic infection of the pulp, periodontal conditions, orthodontic tooth motility or tooth eruption.

Internal inflammatory resorption, the type of resorption identified in the following cases, is characterized by progressive loss of hard tissue in the tooth root. This degeneration is typically found in the cervical region, but has been observed in all areas of the root canal system.

Internal resorption is generally asymptomatic and is discovered most frequently through radiographic examination. The loss of hard tissue is detected radiographically as uniform radiolucent expansion of the tooth canal. If internal root resorption is left to progress untreated, it may result in extension to the periodontal ligament through a crown or root perforation.

Immediately placed implants/immediate provisionalization

The clinician faces a great esthetic challenge in the replacement of single anterior teeth.

In the following cases of internally resorbed incisors with a poor prognosis, extraction followed by immediate placement of an implant is a desirable restorative option. The failing tooth is in the esthetic zone, and therefore an immediate and esthetic replacement is necessary following extraction.

In the past, the non-restorable tooth was extracted and a removable partial denture (or flipper) was fabricated and placed for use during healing. After an adequate healing period, an implant was placed and buried under the gingiva, and the patient
implants

continued to wear the flipper until the implant had osseointegrated and was ready to be uncovered and restored. The patient would therefore wear the removable partial denture for upward of six to eight months.

This course of treatment often results in a less than desirable gingival architecture surrounding the final restoration. There are also clear indications that partial removable dentures are an important causative factor in the alveolar bone resorption process.3

Major cosmetic concerns in the fabrication of the immediately placed provisional are the retention of the interdental papilla and prevention of alveolar bone collapse.4

Research has suggested that immediate provisionalization following implantation allows for greater clinical control over the regeneration of tissue surrounding the site of extraction.5 This benefit offers an esthetic advantage of immediate loading of an implant with immediate provisionalization over alternative-staged therapy treatment options.

Unfavorable alterations to the alveolar bone structure must be avoided using ridge preservation techniques and precautions in terms of osseous exposure.5 Immediate placement of the implant into fresh extraction sockets prevents the post-extraction resorption that occurs commonly with alternate forms of treatment, preserving the integrity of the alveolar ridge.6

_Case study No. 1_

The patient is a 30-year-old healthy male who was examined in our office for a failing maxillary right central incisor. His history involves a soccer accident in 1993 that resulted in an elbow to the face with trauma to the right maxillary central incisor. Approximately one week subsequent to the accident, the patient’s tooth was treated endodontically. It eventually became discolored and grew increasingly out of alignment (Fig. 1).

Clinically, all other maxillary and mandibular teeth were in good condition. Periodontal examination revealed healthy gingival tissue. The patient was concerned that his anterior tooth would fracture unexpectedly and desired an immediate replacement.

_Treatment options_

Several treatment options were considered. The first was extraction of the maxillary right central incisor and fabrication and placement of a conventional fixed bridge of porcelain fused to metal or an all-ceramic system.

The second option was extraction of the tooth followed by placement of a removable partial denture. The next option was extraction, provisionalization with a removable partial denture (flipper) followed by implant placement, healing while wearing the flipper and, finally, restoration of the implant.

The best alternative was extraction and immediate replacement of the extracted tooth with an implant, followed by immediate loading with a nonfunctioning provisional. After adequate osseointegration, a final restoration would be fabricated.

Advantages and disadvantages of all options were explained to the patient. He decided to continue treatment with an immediate implant restoration. The patient was then referred to a periodontist for further evaluation and implant consultation.
Implant examination revealed adequate bone height and width for implant placement immediately following extraction of the failing tooth.

A surgical date was scheduled with the periodontist for extraction of the tooth and placement of the implant. An appointment was coordinated with our office for the patient directly following the surgical procedure for provisionalization of the implant.

**Surgical protocol**

The right central incisor was removed and a Nobel Replace Tapered Groovy (internal connection) 5.0 x 13 mm implant was placed.

An osseous graft of demineralized freeze-dried bone and a collagen membrane were utilized to augment the surgical site. The fixture received an emergence profile-healing abutment. See the radiograph with implant in place (Fig. 2).

**Provisionalization**

The patient presented in our office after the implant placement with a healing abutment in place. The healing abutment was removed. A Nobel Biocare immediate temporary abutment was placed and a provisional was fabricated.

Care was taken to contour the emergence of the provisional as to best support the gingival architecture. The plastic coping for the immediate temporary abutment was roughened with a 56 carbide bur to enhance adherence of the integrity provisional material used.

The provisional was polished and placed on the immediate temporary abutment with a small amount of flowable composite to enhance retention. The provisional crown was fabricated to be completely out of occlusion and non-functional to insure the implant adequate osseointegration time undisturbed by occlusal forces.

The provisional restoration was observed periodically during the six-month healing process to monitor gingival adaptation (Fig. 3).

**Final restoration**

Six-months post surgery, the patient was scheduled for placement of the final restoration. After removing the provisional crown and the immediate temporary abutment, an implant impression post was placed, radiographic verification was made to assure complete seating, and a final impression was taken with a polyether system.

Complex shade mapping was carefully performed to match the existing contralateral natural teeth. The provisional was then reinserted.

A Procera zirconia custom implant abutment was chosen. Zirconium implant abutments have not only been noted for their toothlike color and esthetic appeal, but for their tissue tolerability, high load strength and intrasulcular design enhancement. The extraordinary load strength of the oxide ceramics is not compromised by high bending and tensile strength, and fracture and chemical resistance.
Zirconium abutments are mechanically equivalent to their metal counterparts, but boast greater biological compatibility. Results of a recent study provide evidence that ceramic oxide abutments can be safely utilized in the incisor region of both the maxilla and mandible as determined by maximal bite forces in the esthetic zone.

Because of excellent restorative properties in terms of strength and color conformity, the zirconium implant abutment is becoming increasingly favored by clinicians for esthetically pleasing anterior implant restorations. A Procera zirconia crown was fabricated for this patient with Noritake CZR porcelain (Fig. 4).

At the time of insert, the provisional crown and immediate temporary abutment were removed. The Procera zirconia custom abutment was seated, the screw was hand tightened and the screw torqued to 35 Ncm with the manual torque wrench. The access was filled with a small cotton pellet and topped with a thin layer of flowable composite. The Procera zirconia crown was then seated; margins, contacts and occlusion were confirmed; and the crown was cemented in place with 3M ESPE RelyX luting cement (Fig. 5).

**Case study No. 2**

This patient, a healthy male in his late 30s, was examined in my office for a fractured maxillary right central incisor. The patient had feldspathic porcelain restorations on his upper central and upper lateral incisors that were placed several years ago. He had a history of trauma to the anterior teeth from a sports injury and subsequent endodontic treatment. Recent periapical radiographs showed internal resorption in the upper incisors (Fig. 6).

The patient sustained additional trauma to the maxillary right central incisor through a fall that resulted in complete fracture of the crown (Fig. 7). The tooth was non-restorable. After reviewing the different treatment options, the patient decided on an immediate implant restoration.

Although the maxillary left central incisor also exhibited signs of internal resorption, it was decided that treatment of that tooth would be performed later. Consideration was given to the poor gingival architecture that results from placing adjacent implants in the esthetic zone. He was then evaluated by the periodontist for the surgical placement of the immediate implant for the maxillary right central incisor.

The patient’s treatment was similar to that of the patient in case study No. 1.

The right central incisor was removed and a NobelReplace Tapered Groovy (internal connection) 5 x 13 mm implant was placed. An osseous graft of demineralized freeze-dried bone was utilized to augment the surgical site. The fixture received an emergence profile-healing abutment. The patient then received an immediate non-functioning provisional as the patient did in case No. 1.

**Final restoration**

After the six-month healing period, the final restoration was fabricated. In this case, a one-piece
Clinical internal resorption

Screw-through abutment made from a Nobel BioCare GoldAdapt Engaging NobelReplace (Fig. 8) was fabricated in order to obtain the correct emergence profile of the restoration due to the slightly lingual placement of the implant (Fig. 9).

The restoration was seated, the screw was hand tightened and then torqued to 35 Ncm with the manual torque wrench. The lingual screw access was filled with a cotton pellet and composite restoration (Fig. 10).

Conclusion

Esthetic expectations of patients and the desire for a convenient and timely treatment continue to increase, instantaneous replacement of failing teeth is becoming more routine. In the cases cited above, both patients had sustained juries to their anterior teeth as young adults while engaging in sports. Each of the patients had been treated endodontically and experienced internal resorption of the traumatized teeth approximately 15 years later.

Both of the patients’ careers and lifestyles demanded immediate replacements that were non-removable and esthetically pleasing. The failing teeth were extracted and implants were inserted immediately and restored the same day with a non-functional loaded provisional.

Immediate placement and restoration of a single implant offers a highly esthetic and timely treatment option in the case of internal resorption and tooth failure in the maxillary central incisors.

Furthermore, this treatment eliminates the need for a removable partial denture while maintaining the gingival architecture and preventing alveolar bone loss in the extraction site.

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A list of references is available from the publisher.

Susan McMahon, DMD, has served as a clinical professor in prosthodontics and operative dentistry at the University of Pittsburgh School of Dental Medicine. She is a guest lecturer in cosmetic dentistry at West Virginia University School of Dentistry and lectures to dentists in the United States and Europe on tooth whitening and cosmetic dentistry. McMahon is a six-time award winner in the prestigious American Academy of Cosmetic Dentistry Smile Gallery competition.

You may contact Dr. McMahon at:
SouthSide Works Office
2642 E. Carson St.
Pittsburgh, Pa. 15203
(412) 381-3969
www.wowinsmile.com

Jessica Forestier was a summer intern in Dr. McMahon’s office and is now a first-year dental student at the University of North Carolina at Chapel Hill.

About the author

Susan McMahon, DMD, has served as a clinical professor in prosthodontics and operative dentistry at the University of Pittsburgh School of Dental Medicine. She is a guest lecturer in cosmetic dentistry at West Virginia University School of Dentistry and lectures to dentists in the United States and Europe on tooth whitening and cosmetic dentistry. McMahon is a six-time award winner in the prestigious American Academy of Cosmetic Dentistry Smile Gallery competition.

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- Derived from Achilles Tendon
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- Strong and Predictable Absorption
- Sizes: 15mm x 20mm and 25mm x 30mm

**CollaForm™ Singles Bovine Collagen**
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- Absorbable Collagen for Tissue Preservation
- Maintains Graft in Extraction Site for Ridge Preservation
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- Size: 12mm x 20mm x 3mm each

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- Absorbable Collagen Wound Dressing
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- Size: 10mm x 20mm each

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Artzi reports “What is important is the implant success rate over time, as reported by the Sinus Consensus Conference, a 98% cumulative success rate over 5 years has been found with pure alloplast OsteoGen®.” Artzi further noted that “OsteoGen® is physiochemically and crystallographically equivalent to human bone making it a pure alloplast. The spaces between the crystal clusters facilitate cellular and tissue proliferation within the grafted material, thus enhancing faster osseointegration.”


---

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placement by a surgeon can theoretically be used to obtain adequate anchorage and increase precision and predictability of tooth movement by the orthodontist.

Orthodontic appliances have become smaller, less noticeable and easier to maintain during therapy. Invisible or lingual appliances further improve the rate of acceptance by adult patients. Many adults can now have their teeth aligned to improve their chewing function and their smiles with reduced esthetic effect during therapy.

The concept of surgically accelerated orthodontics (SAO) can significantly reduce the total treatment time of orthodontic therapy.

This exciting, relatively new technique requires a well-coordinated, multidisciplinary treatment approach. It involves intentional surgical "violation" of the alveolar bone with the aim to produce regional acceleratory phenomenon (RAP).\(^1\,^2\)

The biological result of this is osteopenia (decrease of bone mineralization without loss of volume). The clinical result is softer bone, which may allow faster movement of teeth.\(^3\,^4\) In multidisciplinary treatment of adult patients, malocclusion may be associated with tooth loss, bone resorption and a consequent need for implants and/or periodontal treatment and bone augmentation. In these cases especially, efficient interdisciplinary collaboration may result in a great benefit for the patients.\(^5\,^12\)

Periodontally accelerated orthodontic movement, as described by Wilcko, appears particularly feasible in those multidisciplinary cases for which treatment planning requires orthodontic movement and oral or periodontal surgery. In these cases, corticotomy can be combined with wisdom tooth extraction and/or a regenerative technique, such as

---

**Fig. 1** A very resorbed ridge in the edentulous area was evident together with bone dehiscence on teeth #31, #42, #44. A regeneration with xenogenic bone of bovine origine (Endobone, BIOMET 3i, Palm Beach Gardens, Fla.) and a resorbable membrane (Osseoguard, Biomet 3i, United States) was performed. (Photos/Provided by Federico Brugnami and Alfonso Caiazzo)

**Fig. 2** Six months after surgery one osteointegrated implant (BIOMET 3i) in the augmented area was placed. A regeneration of the bony fenestration on tooth #42 was also evident, while the control #44 remained unchanged.

**Fig. 3** Appropriate implant placement requires orthodontic movement.
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Clinical Orthodontics

In order to avoid multiple surgeries, recent orthodontic therapies, especially the so-called low-friction therapies, have demonstrated clinically and radiographically that it is possible to expand dental arches without interfering with periodontal health, by augmenting the alveolar bones. Melsen et al. confirmed what was previously suggested, that the tooth will move with the bone and not in bone, especially when light orthodontic forces are applied.

Dehiscence and fenestration, which are difficult to diagnose preoperatively, may represent a limitation of this technique. Because the tooth will move with the periodontium, in cases in which the periodontium is not present, we might create recession and attachment loss.

Recently some orthodontic therapies, especially the so-called low-friction therapies, have demonstrated clinically and radiographically that it is possible to expand dental arches without interfering with periodontal health, by augmenting the alveolar bones. Melsen et al. confirmed what was previously suggested, that the tooth will move with the bone and not in bone, especially when light orthodontic forces are applied.

If this data is translated in clinical treatment, it may mean that potentially at least 50 percent of orthodontic patients undergoing expanding movement could be at risk of gingival recession and periodontal damage. It would be advisable, then, to introduce routine 3-D X-rays into the preoperative work-up (i.e. cone beam). The cone-beam examination, with a reduced dose of radiation compared with the fan beam (CT scan) and better definition, could be used routinely in those patients with a thin, scalloped periodontium, where the risk of postoperative recessions is higher.

The PAOO technique has been found not only to be predictable in solving dehiscence and fenestration above the roots, but also to produce a noticeable change in the cephalometric analysis of points A and B. With the PAOO technique, the patient needs to be seen routinely for changing the wires, as the teeth movements are much faster than in regular orthodontic treatment. The use of segmental corticotomy (applied only to the teeth that have to move more than the others) can dramatically change the relationship amongst groups of teeth.

This has to be kept in mind because it may require changes in distributing the anchorage by the orthodontist. The teeth in the area of surgery will be moving much faster than the other teeth.

**Conclusions**

Accelerated orthodontic movement techniques can be successfully used to hasten dental movement, treat and prevent periodontal problems and to regenerate ridge defects, thereby allowing delayed implant placement.

**Editor’s note:** This article first appeared in *Implants, the international magazine of oral implantology*, Vol. 12, 2/2011, published by Oemus Media AG, Leipzig, Germany. A list of references is available from the publisher.

**Contact**

Federico Brugnami, DDS
Piazza dei prati degli Strozzi 21
00195 Roma, Italy
Tel.: +39 06 39730191
Fax: +39 06 39730195
fbrugnami@gmail.com

Alfonso Caiazzo, DDS
Private Practice, Salerno, Italy

**Fig. 4** At the time of implant placement, a corticotomy was performed to accelerate the orthodontic movement and facilitate the implant restoration. Regeneration with a first layer of autologous graft collected during site preparation, covered with xenograft and a resorbable membrane (Endobone and Osseoguard, BIOMET 3i, Palm Beach Gardens, Fla.) was performed simultaneously to the placement.

**Fig. 5** Provisional restoration in place.

guided bone regeneration (GBR), in order to avoid multiple surgeries.

A recent study on modern American skulls found that a dehiscence was present in 40.4 percent of the skulls, and a fenestration was present in 61.6 percent of skulls.

If this data is translated in clinical treatment, it may mean that potentially at least 50 percent of orthodontic patients undergoing expanding movement could be at risk of gingival recession and periodontal damage. It would be advisable, then, to introduce routine 3-D X-rays into the preoperative work-up (i.e. cone beam). The cone-beam examination, with a reduced dose of radiation compared with the fan beam (CT scan) and better definition, could be used routinely in those patients with a thin, scalloped periodontium, where the risk of postoperative recessions is higher.

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Piazza dei prati degli Strozzi 21
00195 Roma, Italy
Tel.: +39 06 39730191
Fax: +39 06 39730195
fbrugnami@gmail.com

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American Academy of Implant Dentistry Foundation awards more than $165,000 for research projects

Lozada added that the AAID Foundation ranks as the leading grantor for dental implant research and, overall, it has funded more than 70 research projects totaling more than $600,000. Individual grants range from $2,500 to $25,000.

“The future of implant dentistry will be built upon the commitments that the AAID Foundation makes today to support education, research and the advancement in the practice of implant dentistry,” Lozada said.

One $10,000 AAID Foundation awardee, Mahmoud Torabinejad, DDS, PhD, Loma Linda University, is researching levels of patient satisfaction and complications during and after root canal treatments and single-tooth implants.

“Dr. Torabinejad’s research is an excellent example of the cutting-edge work the AAID Foundation is supporting that will give practitioners solid scientific evidence for making treatment decisions and recommendations to their patients,” Lozada said.

Another grant recipient, Thomas Dodson, DDS, Massachusetts General Hospital, has worked on a study of implant survival rates and factors most commonly associated with implant failures.

“Less than 2 percent of implants fail, but this research should be helpful in determining which types of patient might be prone to possible implant failure,” Lozada noted.

The AAID Foundation’s awards are funded by contributions to the AAID Research Endowment Fund from AAID members, sponsors and friends. Income generated from the endowment is allocated exclusively to support implant research projects.

AAID Foundation Awardees for 2012 will be announced at the AAID Annual Scientific Meeting, Oct. 7-11, in Washington, D.C.
The International Congress of Oral Implantologists (ICOI) will be commemorating 40 years of existence at its 29th World Congress from Sept. 20–22. The venue for this congress will be the World Center Marriott Hotel in Orlando.

The ICOI is expecting a record turnout for this World Congress and, according to ICOI, early reaction is supporting this. Sponsorship response and early registration has been encouraging, program officials say. The ICOI has invited its vice presidents and leaders from its 50 component and affiliate societies to attend this event, where ICOI Co-Chairs Drs. Kenneth Judy and Carl Misch will introduce innovations that the ICOI will be launching at the Orlando Congress.

The theme for this World Congress, “Innovations, Complications and Controversy in Implant Dentistry” was designed by Scientific Chairman Dr. John Russo. As is customary for ICOI programs, the faculty will be truly international with speakers from the United States, Canada, Italy, Germany, Spain, Japan, Greece and likely many more. A partial list of speakers includes: Drs. Misch, Fred Bergmann, Rick Ferguson, Scott Ganz, Ken Hebel, Richard Kraut, Bob Marx, Ed McGlumphy, Craig Misch, Ady Palti and Michael Pikos.

Complementing the doctors program will be a two-and-a-half day program for staff members given by ICOI’s component, the Association of Dental Implant Auxiliaries (ADIA). The valuable training offered to the staff members at these events has become a welcome addition to ICOI’s total continuing educational programs, program officials say.

The ICOI has negotiated a reasonable hotel room rate at the World Center Marriott. Single and double room rates are just $159. International attendees may be anxious to play on the Marriott’s 18-hole championship golf course.

With all that Orlando has to offer, such as Walt Disney World, Epcot Center, Universal Studios and much more, ICOI officials say family member attendance is expected to be significant.

For more information on this fall’s World Congress, visit ICOI’s website at www.icoi.org.
MIS Implants Technologies based in Fair Lawn, N.J., will hold its second Bike Event on July 29.

This year, participants will be riding for “Ninos de la Luz” (Children of the Light), an organization that funds an orphanage for the “lost boys” of the Dominican Republic. This organization shelters boys who have been living on the streets, often abandoned by their families, giving them a place to live, schooling and life skills to eventually live on their own and be a solid member of society.

This year’s bike ride will be 40 miles in length and go through part of the lower Hudson Valley — starting in Park Ridge, N.J., and ending in Piermont, N.Y. A light breakfast will be served prior to the ride as well as replenishing snacks afterward. There will be one planned rest stop along the route.

Motti Weisman, CEO of MIS Implants Technologies, visited the orphanage. He said he was touched and impressed by the commitment of the people running the facility and immediately wanted to help in a substantial way. He was able to meet and dine with some of the boys and was intrigued by their stories.

“The work being done here is remarkable, and I have committed to provide the funding for a media center to help with the boys’ computer skills and ultimately make them current with today’s workplace,” Weisman said. “The boys are able to stay at the facility, known as ‘The Ranch,’ until they are 18. The success stories from this group are truly heartwarming, and I foresee having a long-term relationship with this organization to continue to help.”

There is no government funding available for social needs such as this. Private funding is crucial to give these boys an environment where they can turn their lives around and thrive.

Registration is now open for the 2012 MIS Charitable Bike Ride. For more information, visit www.miscyclingteam.com or call (201) 710-6217. There are different registration packages available. All proceeds from this event will be directly donated to impact international health and earmarked for Ninos de la Luz. Registration fees are tax deductible.

To learn more about the orphanage, visit www.ninosdelaluz.org.
Quick Up method eliminates risk of accidental locking of dentures to implant, cuts procedure time in half

Millions of Americans wear dentures. Unfortunately, the majority of denture wearers are dissatisfied with their prosthesis—their chief complaints being poor retention, discomfort or difficulty speaking and eating. Supporting and stabilizing dentures with small diameter implants (mini-implant retained dentures) can resolve these problems and significantly improve denture retention, offering long-term clinical success.

The procedure involves creating a removable connection between the implants and the corresponding attachments, or secondary components, of the denture. Attachment bonding can be done by a lab in the indirect procedure, which causes a second appointment and is inconvenient for patient and clinician.

As an alternative, it can be done directly in the pick-up method. The direct pick-up method has the advantage that it can be done in one appointment and is more accurate. However, the biggest fear of clinicians is the accidental locking of the denture to the abutment. VOCO now introduces Quick Up, a complete system that virtually eliminates the risk of interlocking and cuts chairside time in half.

The Quick Up product

With everything in one system, Quick Up improves workflow and chairside efficiency, saving time and money. The system includes Quick Up self-curing composite in the QuickMix syringe. Designed specifically for bonding attachments, such as ball, Locator® and telescopic attachments as well as other attachments in acrylic-based dentures, Quick Up self-curing composite can also be used for reattaching secondary elements in a denture, such as bar retainers.

Easy to use, Quick Up self-curing composite demonstrates exceptionally high strength, a physical attribute that’s essential for the long-term stability of denture attachments.

Other components of the system include: Fit Test C&B, used to check whether the openings in the denture base provide enough space to receive the attachments and for blocking out undercuts in the overdenture; Quick Up adhesive, a strong adhesive material that is applied to the underside of the denture to improve composite retention; and Quick
**The Quick Up method**

After the mini-implants have been placed into the jaw, a recess is prepared into the denture. The Quick Up method does not require vent holes. To ensure that the openings in the denture base provide enough space to receive the attachments, the kit includes Fit Test C&B, a control silicone (Fig. 1). This step is optional, but highly recommended for best results. Fit Test can also be used to block out any undercuts around the attachments, teeth or implants (Fig. 2).

Quick Up adhesive is applied and then recess filled only 2/3 full with the fast-setting Quick Up self-curing composite using the Quick Up automix syringe (Fig. 3). By under filling the recess, the risk of interlocking the denture with the intraoral attachments is virtually eliminated.

Furthermore, it saves time by eliminating the time-consuming step of removing excess composite material later. After seating the denture in the patient’s mouth, the material will set intraorally in only 2.5 minutes. After removal, any deficiencies can easily be filled with the light-cured Quick Up LC (Fig. 4).

**Optimized work flow improves the bottom line**

The new Quick Up method not only improves the clinical success rate, but also optimizes work flow. In difficult economic times, it becomes more and more important for clinicians to optimize work flows without compromising quality. The Quick Up method is a great example of how a product can not only improve results, but improve the work flow, save time and, therefore, money.

Compared to indirect lab-processed bonding of denture housings, the clinician saves impression material, disinfection, chairside time and lab fees. Yet even if the direct pick-up method is chosen, there are differences.

The new Quick Up method can cut the procedure time in half and save the clinician up to $125 in chairside time for each procedure.

**Table 1**

<table>
<thead>
<tr>
<th>Classic Method</th>
<th>Minutes</th>
<th>Quick Up Method</th>
<th>Minutes</th>
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</thead>
<tbody>
<tr>
<td>Prepare recess</td>
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<td>Prepare recess</td>
<td>10</td>
</tr>
<tr>
<td>Prepare two vent holes</td>
<td>4</td>
<td>No vent holes</td>
<td>–</td>
</tr>
<tr>
<td>Block out attachment parts with silicone or wax</td>
<td>8</td>
<td>Block out attachment parts with Fit Test</td>
<td>5</td>
</tr>
<tr>
<td>Apply primer</td>
<td>1</td>
<td>Apply primer</td>
<td>1</td>
</tr>
<tr>
<td>Apply pick-up material/reline by over-filling and let it set</td>
<td>8</td>
<td>Apply Quick Up by under filling (2/3) and let it set</td>
<td>3.5</td>
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<tr>
<td>Remove excess material</td>
<td>10</td>
<td>Use Quick Up LC to fill gaps</td>
<td>3</td>
</tr>
<tr>
<td>Polish</td>
<td>10</td>
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<td>3</td>
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<td>Total Chairside Cost ($5 per min)</td>
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When placing an implant, just estimating the location or measurement of bone is not prudent and can be stressful for both the doctor and the patient. The precise knowledge of the bone and surrounding anatomical structures obtained with a CBCT scan is imperative, in my opinion, for the successful placement of an implant. Armed with this information, and with a 3-D image that I can rotate or slice in any direction, I can make knowledgeable decisions necessary regarding whether to place the implant or whether other solutions are necessary, such as bone grafting or even a different prosthetic solution.

As CBCT imaging continues to evolve, I find my system offers applications that extend beyond diagnosis — to treatment planning and placement — becoming an integral part in the entire process from start to finish.

A new and very helpful step in the 3-D implant placement process in my implant centers is the Tx STUDIO software that is integrated into my i-CAT® system. With the tools in this software, I can measure bone, find pathology, automatically map the nerve canals, determine tooth positioning and impactions and location of the implant site to other vital anatomical structures.

Within a few minutes, and with just a few mouse clicks, I can plan the surgery and also place virtual implants, abutments and restorations into the 3-D image. The software also contains an implant library, and scans are compatible with all major surgical guide systems. This not only helps me to start treatment with more details, it also helps me to educate the patients in a visual way that they can understand. Because the software allows all of this planning to be done chairside, I can show the patient exactly what has to be done to place his/her implant.

3-D technology also allows me to work with other specialists for the patients’ best interests. For example, when working with orthodontists, if a patient has a congenitally missing or traumatically lost tooth, the data obtained with my scan allows us both to maintain the space necessary to receive an implant at the right time during treatment. Without this, teeth can drift, requiring longer orthodontic treatment.

Once my clinical objectives are met, another very important aspect — the esthetic objective — is also aided by the 3-D scanning process. I custom mill ceramic abutments and use IPS e.max® crowns using my E4D crown milling machine. Software called E4D Compass integrates the 3-D data from my CBCT with E4D scan data for formulation of my entire restorative plan. When the data from the 3-D scan and the
E4D Compass is integrated, it is possible to view a specific type of implant, adjust abutment alignment and view bone and soft tissue to better anticipate the implant process. The whole process of digital radiography, CBCT and CAD/CAM milling provide for a smooth implant process.

The information from the CBCT is an aspect that I would not want to do without, and now, I can obtain that wealth of information while controlling the radiation dose within the limits of ALARA (as low as reasonably achievable). My CBCT also affords me control over radiation dosage through scan settings. With each scan, I am able to tailor the radiation exposure to the individual needs of the patient. When taking a CBCT scan, the i-CAT allows me to focus on a particular area of interest. The 4.8-second scan allows the clinician to expose the patient to a minimum amount of radiation while still achieving the diagnostic information necessary for optimal treatment.

An article published in the Journal of the American Dental Association noted that CBCT scans are “accurate and cost effective and can be used to improve communication and coordination of a multidisciplinary team to achieve the desired clinical outcome.” It is very beneficial to be able to virtually run through multiple treatment scenarios until I discover the best treatment plan for the patient, and then use my other compatible software tools for clinical implementation.

From diagnosis to treatment planning to implementation, one 3-D scan provides all of the information necessary for better implant placement — for patients and dentists, the benefits of this imaging method touch all parts of the implant process — from start to finish.

Reference


About the author

Justin Moody, DDS, graduated from the University of Oklahoma, College of Dentistry. As a supporter of organized dentistry and continuing education, he maintains membership with the American Dental Association, American Academy of Implant Dentistry and Academy of Osseointegration, as well as state and local societies. Additionally, Moody is a diplomate with both the International Congress of Oral Implantologists and the American Board of Oral Implantology/Implant Dentistry and a fellow with the American Academy of Implant Dentistry. He also holds mastership and fellow status at the Misch International Implant Institute. Moody has been in private practice in Crawford, Neb., since 1997 and is the director of the Rocky Mountain Dental Institute.
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About BIOMET 3i

BIOMET 3i, a division of Biomet, Inc., is a leading manufacturer of dental implants, abutments and related products. Since its inception in 1987, BIOMET 3i has been on the forefront in developing, manufacturing and distributing oral reconstructive products, including dental implant components and bone and tissue regenerative materials. The company also provides educational programs and seminars for dental professionals around the world.

BIOMET 3i is based in Palm Beach Gardens, Fla., with operations throughout North America, Latin America, Europe and Asia-Pacific. For more information about BIOMET 3i, visit www.biomet3i.com or contact the company at (800) 342-5454; outside the United States, dial (561) 776-6700.
SAVE THE DATE

Yankee Dental Congress 2013 will bring together thousands of brilliant minds to learn about the most innovative approaches, practices, and resources in dentistry.

Here is a sneak peak at a few education highlights:

Gordon Christensen, DDS
RESTORATIVE

Loretta LaRoche
PERSONAL DEVELOPMENT

Kenneth Hargreaves, DDS
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Laney Kay, JD
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Zimmer Dental now distributing IngeniOs synthetic bone-grafting products

IngeniOs HA Synthetic Bone Particles, left, and IngeniOs β-TCP Bioactive. (Photo/Provided by Zimmer Dental)

In Zimmer Dental Inc., a leading provider of dental oral rehabilitation products and a subsidiary of Zimmer Holdings, Inc., is pleased to announce an exclusive agreement with curasan AG, to globally distribute innovative synthetic bone grafting materials to the dental market under the IngeniOs™ brand.

IngeniOs HA Synthetic Bone Particles are a 100 percent non-biologic, pure-phase hydroxyapatite (HA) bone substitute for filling bone defects in a number of dental procedures, including alveolar ridge augmentation, guided tissue regeneration, extractions and sinus lifts. With up to 80 percent porosity and minimal resorption over time, IngeniOs HA is designed to provide long-lasting support of vascularized bone formation and exhibits radiopac-ity for easy X-ray identification.

For clinicians interested in a 100 percent non-biologic, resorbable solution, Zimmer Dental offers IngeniOs β-TCP Bioactive Synthetic Bone Particles. This silicated grafting formulation offers the potential for increased bioactivity and is designed to resorb in balance with replacement by naturally-regenerating mineralized bone.

IngeniOs β-TCP Bioactive, also radiopaque, has up to 75 percent interconnected porosity to helpenable ingrowth of healthy bone tissue. Like IngeniOs HA, IngeniOs β-TCP is indicated for a variety of dental procedures, including alveolar ridge augmentations, filling periodontal defects, extractions and sinus lifts.

The IngeniOs product line expands Zimmer Dental’s comprehensive regenerative portfolio (which includes a variety of allograft and bovine options for both hard- and soft-tissue augmentation procedures) with viable synthetic hard tissue regenerative options.

“Zimmer Dental continues to demonstrate a strong commitment to improving patients’ lives,” said Harold C. Flynn, Jr., Zimmer Dental president. “This agreement strengthens our industry-leading regenerative portfolio by offering a variety of synthetic options to our diverse customer base. By providing world-class dental implants, tried-and-true restorative options, and cutting-edge regenerative solutions, we give clinicians the flexibility to serve their patients with the most comprehensive portfolio in the industry.”

For more information regarding these synthetic regenerative options, contact a Zimmer Dental sales consultant or customer service at (800) 854-7019, or visit www.zimmerdental.com_.

IngeniOs HA Synthetic Bone Particles, left, and IngeniOs β-TCP Bioactive. (Photo/Provided by Zimmer Dental)
**Introducing BLOSSOM**

_Intra-Lock_ is proud to introduce BLOSSOM®, a new technology in self-tapping screw-type dental implant architecture.

This engineering breakthrough (patent pending) eliminates the need for conventional flutes and vents that traditionally define self-tapping implants. Implants augmented with BLOSSOM self-tapping technology feature a fully integrated tapping configuration that is distributed along the implant.

They are angled and augmented by evenly spaced, crescent-shaped, helical cutting segments. This design is intended to mitigate the high compressive forces that build up when conventional tapping segments become clogged with bone debris (crowding), which can unnecessarily increase insertion torque.

BLOSSOM self-tapping implants continually cut through the bone with remarkable efficiency and lower insertion torque; a result of greater cutting efficiency, the elimination of crowding and less friction.

Reduced micro-movement is enhanced by greater intimate bone contact, larger volume of surface area engaged with bone and efficient tap architecture.

BLOSSOM technology is currently available on selected Intra-Lock Dental Implants. For more information, visit [www.intra-lock.com](http://www.intra-lock.com).
In the event patients become edentulous, dentures offer many advantages compared to other alternatives. They are esthetically pleasing, easy to maintain and cost effective. However, these benefits are often hampered by patient discomfort and may lead to difficulty in chewing, pronunciation and freely expressing facial expressions such as smiling or laughing. To compensate, denture wearers often change their daily routine and diet in ways that expose them to greater health risks.

Clearly this situation often leaves dentists less excited about proposing dentures as a viable solution for their edentulous patients. Paul Homoly, DDS, president of Homoly Communications, suggests the shortcomings of a traditional denture treatment prevent most dentists from being content with this treatment option for their patients. Dentatus also found that dentists may be prolonging tooth extractions, particularly in the mandibular arch, because of poor retention of dentures and continual bone resorption.

There is, however, a treatment option that can dramatically improve the patient experience with a lower denture and prevent bone resorption. Meijer et al., reports that patients with mandibular overdentures supported by implants are more satisfied compared to patients without the implants. With the advent of narrow-diameter implants, this treatment option is now more accessible than ever before. Dentatus has found that narrow-body implant retained overdentures can overcome many hurdles providing more patients with access to the latest and most beneficial treatments available.

Research

Atlas narrow-diameter implants are built and clinically proven for long-term use. They are tested with university-based research from around the world; the first results were published in 2004. In 2007, Dr. Sang-Choon Cho, Dr. Stuart Froum and his colleagues from the New York University Department of Implant Dentistry published a study in PPAD stating, “In this study, full mandibular dentures supported by nonsplinted, dome-shaped NBIs provided immediate occlusal loading and function with high survival rates of both the NDIs (i.e., 94.1 percent) and prostheses (i.e., 100 percent).”

In 2005, JOMI published Dr. Michael Rohrer’s histology study on Dentatus implants. Rohrer determined that the percentage of bone in contact with the body of Dentatus implants in “the same range and sometimes higher than what is usually seen with conventional implants.”
FEATURING

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These results support well-known literature about implant design and materials in the following ways: Atlas narrow-body dental implants are composed of grade V, titanium alloy; the threaded portion of the implant is mechanically roughened to increase surface area and maximize the bone-implant interface; and the tapered design better facilitates implant placement, promotes initial implant stability and better distributes occlusal loads along the body of the implant.

_Ease of restoration_

Site preparation in the atrophic anterior mandible often provides practitioners with challenging anatomic limitations such as exaggerated facial lingual bone angulation created by the submental fossa and the mentalis muscle insertion. As such, angulation of the implants may vary from site to site resulting in non-parallel implant placement. During the retrofit process, this can lead to attachments protruding out of the denture flange or may weaken the denture by drilling into the denture teeth.

With Atlas implants a silicone material of flowable nature (Tuf-Link, Dentatus) offers cushioned support designed to maximally engage the dome-shaped head to achieve clinically significant retention even in these less than ideal conditions.

The reline provides for an individualized custom fit every time, the first time. Additionally, the silicone based reline provides retention without rigidity, thereby reducing unwanted lateral forces further increasing integration potential, ultimately protecting the implant.

_Advantages_

The advantages of the Atlas narrow-body implants are several. First and foremost, they expand the patient population that is eligible for this treatment. Narrow-body implants make it easier to maintain adequate buccal-lingual bone dimensions and proper implant spacing without the need for ridge augmentation. The narrow-body diameter allows a thicker buccal bone because less bone is removed for the osteotomy. The tapered one-piece implant design eliminates the microgap, which is related to crestal bone loss, facilitates one-stage surgery, provides immediate restoration and is more conducive to a flapless implant placement. Utilizing a minimally invasive flapless procedure with an immediate restoration eliminates many postoperative challenges and reduces total treatment time.

Isn’t it time you looked into this treatment option to restore quality of life for your denture patients?

Dentatus makes it easy for you to get started with its half-day hands-on workshops. All the materials for your first case are included in the registration fee.

_Information_

For more information, check out www.dentatus.com or call (800) 323-3136.
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A new generation of small diameter soft-tissue level implant

**Straumann introduces Narrow Neck CrossFit Standard Plus Implant**

We are very excited to present the Straumann® Standard Plus Narrow Neck CrossFit®, our new Ø 3.3 mm soft-tissue level implant. Combining the latest technologies, NNC is designed to provide excellent treatment outcomes in challenging treatment situations.1 What does this mean for you?

**Confidence when placing small diameter implants**

Our Roxolid® material provides high strength* and improved confidence when placing narrow diameter implants while the SLActive® implant surface accelerates the osseointegration process2 and helps provide predictability in implant treatment.

**Wide range of treatment options**

Comprehensive prosthetic options due to narrow Ø 3.5 mm prosthetic platform with internal connection including screw-retained and cement-retained restorations and your choice of implant-level or abutment-level impression workflow.

**Simplicity in daily use**

The self-guiding CrossFit connection offers improved prosthetic flexibility and optimizes abutment insertion3 while the new transfer piece simplifies handling during surgical placement. This soft-tissue level implant is designed to save time and increase efficiency in your practice.

*Fatigue strength according to ISO 14801 internal tests, data on file (B679A/B567A)

**References**

1. Small diameter implants are not recommended for use in the molar region
2. Compared to SLA in an animal model
3. Compared to Straumann Narrow Neck Implant

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*Photo/Provided by Straumann*
submissions

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Please note that all the textual elements of your submission:

- complete article
- figure captions
- literature list
- contact info (e-mail address please)
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All images must be submitted separately, and details about how to do this appear below.

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We can run an extra long article in multiple parts, but this is usually discussing a subject matter where each part can stand alone because it contains so much information. In addition, we do run multi-part series on various topics. In short, we do not want to limit you in terms of article length, so please use the word count above as a general guideline and if you have specific questions, please do not hesitate to contact us.

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Please do not hesitate to contact us for our International C.E. Magazine Author Kit or if you have other questions/comments about the article submission process:

- Group Editor Robin Goodman
  r.goodman@dental-tribune.com
- Implants Managing Editor Sierra Rendon
  s.rendon@dental-tribune.com
- Managing Editor Fred Michmershuizen
  f.michmershuizen@dental-tribune.com
implants
the international C.E. magazine of oral implantology

U.S. Headquarters
Dental Tribune America
116 West 23rd Street, Ste. 500
New York, NY 10011
Tel.: (212) 244-7181
Fax: (212) 244-7186
feedback@dental-tribune.com
www.dental-tribune.com

Publisher
Torsten R. Oemus
t.oemus@dental-tribune.com

Chief Operating Officer
Eric Seid
e.seid@dental-tribune.com

Group Editor
Robin Goodman
r.goodman@dental-tribune.com

Managing Editor
Fred Michmershuizen
f.michmershuizen@dental-tribune.com

Implants Managing Editor
Sierra Rendon
s.rendon@dental-tribune.com

Designer
Kristine Colker
k.colker@dental-tribune.com

C.E. Director
Christiane Ferret
c.ferret@dtstudyclub.com

Marketing Manager
Anna Wlodorczyk-Kataoka
a.wlodorczyk@dental-tribune.com

Marketing Assistant
Lorrie Young
l.young@dental-tribune.com

Accounting
Melissa Chan
m.chan@dental-tribune.com

Account Manager
Robert Spencer
database@dental-tribune.com

Account Manager
Mark Eisen
m.eisen@dental-tribune.com

Account Manager
Humberto Estrada
e.estrada@dental-tribune.com

Account Manager
Will Kenyon
w.kenyon@dental-tribune.com

Account Manager & Interactive
Gina Davison
g.davison@dental-tribune.com

International Account Manager
Jan Agostaro
j.agostaro@dental-tribune.com

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