Minimally invasive implant placement without the use of biomaterials

AO session:
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Smarter case approach with new system to streamline treatment
c.e. article
04 Minimally invasive implant placement without the use of biomaterials using the bone-expansion technique
__Gilles Chaumanet, DMD, MSc

clinical
09 Feline dental implants: New paradigm shift in maxillary cuspid extraction treatment planning
__Gregori M. Kurtzman, DDS, MAGD, DICOI, DADIA

events
16 AO session: Protecting young clinicians

industry
18 Implant Direct introduces smarter case approach with a new versatile system to streamline treatment coordination

20 Immediate tooth replacement with the Hahn Tapered Implant and BruxZir Anterior Solid Zirconia
__Timothy F. Kosinski, DDS, MAGD

about the publisher
22 Imprint

on the cover
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Minimally invasive implant placement without the use of biomaterials using the bone-expansion technique

Author: Gilles Chaumanet, DMD, MSc

The success rate in implantology is close to 96 percent. Thanks to well-established implant placement protocols, with a few differences according to the implant system used, the predictability of the result under optimum tissue conditions is quite significant. It is very different when these conditions do not meet the recognized standards in terms of volume and quality for reproducibility in implantology. For example, thin ridges, which are frequent occurrences, will require a long and costly process for patients because they entail bone augmentation or possibly support tissue grafts.

Is there a minimally invasive alternative for these patients that allows them to be treated without these problems? One line of thinking is to stop the systematic practice of implantology as subtractive at the tissue level, but rather to transfer these volumes and thereby ensure a minimally invasive procedure. This implies reviewing all the biomechanical principles of implantology, not only in terms of the implant structure and design but also in relation to peri-implant tissue.

The general surgical principle of modern implantology since Brånemark has been bone preparation, called osteotomy, as close as possible to the dimensions of the implant that will be placed. This principle is still widely prevalent.

However, soft-tissue management has evolved, and the trend the past few years has been to manage soft tissue from the first surgical step. With the arrival of self-tapping conical implants, a new technique was developed that enables lateral as well as vertical bone compressing, condensing or expanding. In addition, in 1994, Summers, practicing his crestal sinus lift technique with careful choice of conical taps, was the first to demonstrate the capacity of cancellous bone to be modeled (Fig. 1).

Through two clinical cases, we will see it is possible to be minimally invasive, precise and also avoid the use of biomaterials simply by exploiting the biomechanical properties of bone tissue and its capacity to regenerate. Respecting guided regeneration principles, which means the implementation of physical barriers to isolate the epithelial and connective tissue cells from the operating site, enables regeneration of the different tissues.

These principles are (Fig. 2):
• Primary closure of the surgical site to enable...
undisturbed and uninterrupted healing.

- Completion of the best possible angiogenesis to provide the required vascularisation and undifferentiated mesenchymal cells.
- Creation and maintenance of a space to facilitate bone formation inside this space.
- Stabilization of the surgical site to induce blood clot formation and facilitate healing.

Thanks to the careful choice of the healing screw or the implant abutment/temporary crown pair, these two entities with different regeneration potentials can be hermetically sealed, thereby avoiding cell competition, which we know contributes to the growth of epithelial cells that develop more rapidly.

_Case 1_

The patient presented with a fracture of #16 (Fig. 3) and periapical cysts. With the patient’s consent, the decision was made to perform an extraction, debridement, socket decontamination and immediate placement of a non-submerged implant (implant and healing screw) using Summers’ method (crestal sinus lift). The patient was on standard premedication with amoxicillin and corticosteroids. The #16 was carefully extracted by radicular separation to avoid bone fracture especially in the vestibule where
the cortical bone is very thin. The lamina dura, which enables the attachment of collagen and Sharpey’s fibres, presents a high potential for contamination. Consequently, a light manual curettage of the socket was carried out, followed by a superficial debridement (vaporisation) of the entire “lamina dura” with an Erbium laser (2,970 nm) followed by decontamination with a diode laser (940 nm).

This was a flapless surgery. The expansion osteotomy was performed through the inter-radicular septum. It was initiated with a very thin manual bone tap (pointed), and then an automatic mechanical osteotome (Figs. 4–5) (OsteoSafe® – Anthogyr) was used. The use of convex inserts in the beginning enables lateral expansion of the native or healed bone, and then concave inserts during the breaking of the last sub-sinus millimeter enables lateral bone recovery of this bone socket while projecting it apically.

During sinus progression, PRF membranes (or native collagen membranes) are placed in the osteotomy opening to fill the intra-sinus space that is thereby gained (they also provide protection of the sinus membrane).

The Erbium laser is again passed through the osteotomy socket to vaporize the bone debris and sludge along the walls of this osteotomy. The implant is placed according to the manufacturer’s recommendations but with an even slightly higher torque if the titanium grade so allows. A healing screw that fits the diameter and height of the residual gap to be closed is carefully chosen (Fig. 6).

If the healing screw does not enable primary closure of soft tissue, PRF membranes are used to fill the gap. If this gap is too big, a mucoperiosteal detachment of 6–10 mm and then a horizontal incision of the periostium of 6–8 mm are made. This technique serves to pull the gum around the healing screw by maintaining it with two sutures. The control X-rays clearly showed good osseointegration of the implant, significant filling and regeneration in only three months, and then perfect filling and regeneration four months after surgery.

The bone remodeling around and above the implant neck also seemed to be well executed. The cone-beam 3-D imaging in the first place showed a healthy sinus without inflammation or infection as well as bone remodelling at the apex and around the implant (Figs. 7, 8).

In the case of a trans-alveolar sinus lift combined with the placement of an implant by bone expansion, convex-tipped inserts should be used first to enable lateral expansion, and then concave inserts enable scraping of the bones of the lateral walls of the osteotomy to enable apical projection after breaking the

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Fig. 7. Panoramic views: (7a) Pre-op, (7b) Post-op, (7c) three months, (7d) follow-up at one year.

Fig. 8. Control at six months.

Fig. 9. Pre-operative view of fistula on #24.

Fig. 10. Panoramic view with gutta-percha cone inserted in the fistula that reaches the apex.
last millimeter under the sinus floor. If a maxillary implant is to be placed completely in native bone, convex inserts suffice. The last insert that is placed is smaller in diameter than the implant that is chosen.

The advantage of this technique was noted starting in 1996 by Summers himself with the use of conical osteotomes as opposed to cylindrical osteotomes, which were all that were available up until then. The idea was actually to enable lateral peri-implant bone condensing in order to increase notably the primary stability and compensate for the lack of vertical dimension of the sub-sinus native bone.

The objective of this technique is to maintain, if possible, the entire maxillary bone by laterally pushing back the bone with minimal trauma while creating a precise osteotomy that breaks the last millimeter of the sinus floor while protecting the sinus membrane. The consequence is the notable increase in peri-implant bone density with a high elevation of BIC (Bone Implant Contact) and, therefore, bone stability.

Case 2

The patient presented with a fracture of #24 with significant periapical infection (Figs. 9, 10).

It was decided that an extraction would be performed with immediate placement and loading of an implant after complete decontamination of the extraction socket using lasers (Figs. 11, 12). Next, Osteo Safe was used (Fig. 13) to enable gentle trabecular expansion and placement of a self-tapping conical implant (Axiom PX®. Anthogyr).

In this case, where bone recovery along the osteotomy walls was not necessary, only convex inserts were used. The palatal and subcrestal position of the implant is respected (Fig. 14). The gap between the implant and the vestibular cortical bone is not filled. Careful choice of the implant abutment enables an ideal emergence both in terms of hard tissue and soft tissue. The temporary crown is thereby shaped in such a way that it closes the gap by slightly compressing the marginal gum (Fig. 15).

It is mounted out of functional occlusion. Of course, the patient was advised to avoid voluntary chewing on this implant and only use local cleaning with cotton soaked in Chlorhexidine.

Following verification of the osseointegration (Fig. 16), the impression was made eight to 10 weeks after surgery, followed by placement of the permanent prosthesis (Fig. 17).

Conclusion

The implant placement technique with the use of osteotomes is not a new concept. On the other hand, using an automatic osteotome provides a better view of the site and makes it possible to practice flapless surgery, to position more precisely and obtain more homogeneous progression, in comparison to using bone taps with a surgical mallet. From the patient’s perspective, surgical comfort is significant and very noticeable.
It should be borne in mind that if you want to avoid using filling materials, tissue must be conditioned to enable its regeneration. For immediate post-extraction implant placement, lasers are of unrivalled usefulness because they enable socket decontamination and induce bone regeneration. If the basic principles of this bone regeneration are respected, the conditions are adequate enough to enable bone growth without the use of biomaterials.

These advantages are decisive during preparations such as alveolar sinus lifts as well as “split crest” where the buccal cortical bone is generally very fragile.

Vital importance is attributed to the closure of soft tissue during implant placement, either by carefully choosing the healing screw (the height and diameter) or the implant abutment, enabling slight compression of soft tissue and providing the implant/prosthetic connection system with a “barrier” that enables the regeneration of the two families of tissues.

These minimally invasive techniques still require many improvements and more widespread validation. However, for ethical and safety reasons, the practitioner should always suggest the least invasive technique that contributes to, guides and induces this tissue regeneration for which, most of the time, we have the matrix around these traumatized zones.

References are available upon request from the publisher.
Feline dental implants: New paradigm shift in maxillary cuspid extraction treatment planning

**Authors:** Rocco E. Mele, DVM, Anthony Caiafa, BVSc BDSc, and Gregori M. Kurtzman, DDS, MAGD, DICOI

Felines (cats) are by nature carnivores and, as such, their diet reflects that. It is accepted that diet affects health, and ability to eat (or lack thereof) can have negative effects on the diet, and thus, general health. Implants have become an option for replacement of lost canines in these animals. This allows the animal to maintain the level of mastication found in those felines who have normal oral health and permit better nutrient uptake as well as psychological maintenance of the animal. We will discuss two cases of lost maxillary canines and implant treatment to replace the lost teeth.

**Case report 1**

A 4.5-year-old male neutered Russian Blue cat weighing 11.5 pounds was referred for multiple bite wound evaluation and a luxated R maxillary canine tooth (#104) of three-day duration. On initial examination, there were multiple bite wounds with deep penrose drains in place, bruising and abrasions in the inguinal areas. The sites were stable. Also, the R maxil-

**Fig. 1** Radiograph demonstrating alveolar fracture adjacent to mobile maxillary right canine.

**Fig. 2** Implant placed into osteotomy at immediate extraction site at the right maxillary canine with buccal flap (left and middle) and primary closure of the site (right).
lary cuspid was luxated with a slight mesial deviation, mobility and painful.

All treatment options were considered with the owner of the pet. These included: stabilization of the luxated tooth followed by endodontic treatment in two or three months; extraction of the canine and no replacement; or extraction with immediate implant placement, providing the alveolar process and vault were intact and primary stability of the implant could be attained. After discussion with the feline’s owner reviewing the pros/cons of the different treatment options, the owner chose to have the canine extracted and implant placed.

The authors believe all three options have their own inherent complications. The owner did not desire having a cat without prominent anterior teeth. The owner, a well-educated engineer, analyzed all of the options and made an informed decision.

The lead author has performed numerous stabilization and endodontic treatment cases with luxated canines in dogs with relatively good results. In his experience a Figure 8 wire around the canines and use of acrylic or spot cure with some flowable composite has not been a positive experience for cats with luxated canines. They typically don’t tolerate the procedure very well. With a fracture as it presented in this case, the maxillary right cuspid (tooth #104) is not very stable and can be a challenge maintaining proper occlusion. Even with the best intentions, possible periodontal ligament devitalization and endodontic treatment being attempted in two to three months, a very good possibility of root resorption complication exists. Additionally, extraction and immediate implant placement can also be problematic. But it’s less problematic than attempting to stabilize the luxated canine with subsequent endodontic treatment.

At the time surgery was performed, all past immediate implants in cats have integrated, and no integration failures have been observed during long-term follow-up on these patients. If the implants are not restored (put to sleep), the buccal osseous morphology is well-maintained, preventing a traumatic episode with the ipsilateral canine. Implant placement in these situations are becoming more predictable with happy owners and patients.

**Surgical phase**

The patient was pre-medicated with Atropine Sulphate (1/120 grain; 1 ml/20#; subcutaneously; VetOne; Boise, Idaho) and Acepromazine (10 mg/ml; .02-.05/#; subcutaneously; VetOne). Atropine is given before anesthesia to decrease mucus secretions orally and has the added benefit of regulating heartbeat during sedation. Acepromazine is a common tranquilizer and central nervous system depressant given to pets. It is also used to prevent anxiety associated with thunder, fireworks and vet or groomer visits.

General anesthesia was induced by mask with Sevoflurane (vaporizer #7, O2 @ 4L per minute;
VetOne). Oral tracheal intubation was completed and anesthesia was maintained at vaporizer setting #3, O2 1L/minute following Feline Anesthetic Protocol (FAP).

A complete oral exam and digital PA radiographs were obtained. A luxation of tooth #104 and some mobility was noted. Additionally, a widening of the periodontal ligament space with a vertical fracture of the incisive bone at the diastema of teeth #s 103/104 was observed (Fig. 1).

A sulcular full thickness MP flap was elevated to evaluate the alveolar process of the maxillary bone. The canine tooth (#104) was atraumatically extracted to avoid any further damage to the alveolar socket and surrounding bone. Socket debridement was performed and copious levage was complete with 0.9 percent NaCl (VetOne). The site was prepared to accept a 5.0 x10 mm Engage implant (OCO Biomedical, Albuquerque, N.M.), which was subsequently placed into the osteotomy and positioned subcrestally with a final insertion torque of 45 Ncm.

The crestal gap between the implant and socket was filled with Fusion Bone Putty (Veterinary Transplant Services (VTS), Kent, Wa.) to assist in socket regeneration and to minimize bone resorption. A cover screw was placed and the flap repositioned to achieve primary closure with 5-0 resorbable monofilament sutures (Securos Surgical, Fiskdale, Mass.) (Fig. 2). Recovery was uneventful and the patient was discharged with post-surgical instructions the same day. Clavimox (62.5 mg/ml @ 1ml bid) (Zoetis, Florham Park, N.J.), a broad-spectrum antibiotic, and Buprenorphine (0.1 ml b/d for 3-5 days) (Reckitt Benckiser Healthcare, Parsippany, N.J.), an opioid pain reliever, were dispensed to the owner.

Uncovering and restoration phase

At six months post-insertion, the patient was re-evaluated for soft-tissue healing and osseointegration. FAP was again utilized as in the surgical phase. Dental radiographs were evaluated and implant stability and integration were determined to be adequate.

A tissue punch was used to expose the implant head, preserving adequate attached gingiva on the buccal. The cover screw was removed and closed tray implant impression abutment was placed (OCO Biomedical) and a radiograph taken to verify proper mating of the impression head to the implant (Figs. 3a, 3b). Impressions were fabricated with a fast set VPS hand mix putty and a fast set light body VPS impression material (Benco Dental Supply, Tucson, Ariz.). A transmucosal healing abutment (OCO Biomedical) was placed to insure proper emergence profile to support the future prosthetic components (Fig. 3c). The impression was sent to the dental lab (Doks Dental, Tucson, Ariz.), and a soft-tissue stone model was fabricated with analogs embedded within. The planned prosthetic was waxed up for a palladium implant restoration, which would be luted into the implant (Fig. 4).
At one-month post impressions, the patient returned for delivery of the implant restoration. FAP was again utilized and the prostheses was tried in and then was cemented into the integrated implant utilizing a self-adhesive resin cement (BisCem, Bisco Inc., Schaumburg, Ill.) (Fig. 5).

The 26-month follow-up demonstrated excellent emergence profile and implant stability with no evidence of periimplantitis or soft-tissue inflammation surrounding the implant restoration (Figs. 6, 7).

**Case report 2**

A 14.3-year-old male neutered DLH cat weighing 16.2 pounds presented for an oral examination. Generalized calculus and gingivitis was noted, as well as multiple Feline Oral Resorptive Lesions (FORL) and a complicated crown fracture of the right maxillary canine (#104).

Initial treatment options were discussed with the owner, which included scaling and root planing to treat the generalized periodontal condition and selective extractions determined by the initial probing and dental radiographs. The fractured canine treatment would be discussed after a complete oral examination and radiographs were completed under a general anesthesia. The right maxillary canine (#104) fracture appeared to have been present for a long period with some definite buccal bone changes related to the fracture.

**Surgical phase**

Patient was pre-medicated with Atropine Sulphate (1/120 grain; 2 ml subcutaneously) (VetOne) and Acepromazine (10 mg/ml; .05 ml subcutaneously) (VetOne). General anesthesia was induced by mask with SevoFlurane (Vaporizer #7 / O2 at 4L/minute) (VetOne). Oral tracheal intubation was completed and anesthesia was maintained at vaporizer setting #3 / O2 at 1L/minute following Feline Anesthetic Protocol (FAP).

A complete oral exam and dental radiographs were obtained. Multiple FORL were noted and charted. FORL are common in cats and are similar to cervical external resorptive lesions in humans. These teeth typically have a poor prognosis and require extraction to treat them. Selective surgical extractions were successfully completed while tension-free tissue flaps were placed at the extraction sites to achieve primary closure.

The right maxillary canine (#104) had sustained a prior traumatic fracture with pulp exposure. Definite buccal enlargement consistent with alveolar inflammation (osteitis) was present. Radiographs confirmed the diagnosis with secondary root changes evident (Fig. 8). Endodontic treatment would have been an option; however, the root morphology and sclerotic canal would be problematic.

As in Case 1, the owner elected to extract the tooth and place an immediate endosseous implant, if possible, and wait four-to-six months before a final restoration could be placed. In many cases, the author is placing immediate implants with the future option of restoration utilizing digital treatment planning. Using these advanced computer-aided techniques (extra-oral scanning and CAD/CAM design and milling), final results have proven to be exceptional compared to the traditional methods of VPS impression taking and wax-cast restorations.

A coronectomy was made on the right maxillary canine (#104) for easy access of the tooth root. It is imperative to remove the remaining root while maintaining the buccal eminence. A mini envelope flap was utilized to maintain a good blood supply to the crestal bone. A fine diamond burr (#FG 703) (Benco Dental) in a high-speed water cooled drill was used to detach the periodontal ligament, making luxating and extraction a simpler process with less risk of alveolar fracture (Fig. 9a).

Examination of the socket was performed and removal of any inflammatory granulation tissue was accomplished with a curette and fissure burr. Socket measurements (probing and radiograph) were obtained and the site was prepared to accept a 5.0 x 10 mm Engage implant (OCO Biomedical), which was
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inserted subcrestally with a final insertion torque of 50 Ncm (Figs. 9b, 9c). The crestal gaps between the implant and osteotomy were augmented with feline periomix, a DFDBA product (Veterinary Transplant Service, Kent, Wa.), which was rehydrated with 2 percent Xylocaine with 1:50,000 epinephrine (Dentsply, York, Pa.). Flap apposition was made to achieve primary closure with a combination of simple interrupted and cruciate suture patterns. Suture material was 5-0 Sevocryl with a reverse cutting P3 needle (Securos Surgical, Fskdale, Mass.) (Fig. 9d).

Recovery was uneventful, and the patient was discharged with postsurgical instructions the same day. Clavimox (62.5 mg/ml for 1 ml bid) (Zoetis) and Buprenorphine (0.1ml bid orally for 3-5 days) (Reckitt Benckiser Health Care) were dispensed.

Uncovering and restoration phase

At five-months post-implant placement, the patient returned for the start of the restorative phase (Fig 10a). FAP was administered and radiographs were obtained to verify osseous integration (Fig. 11). A tissue punch was utilized to expose the cover screw, and it was removed from the implant (Figs. 10b, 10c). It is crucial to develop and maintain healthy keratinized tissue at the healing abutment site. This KT will minimize bone resorption and inflammatory reaction around the prosthetics.6

A closed tray impression coping was secured to the implant (Fig. 12, bottom), and VPS impressions were obtained. The impression coping was removed intraorally, and a healing abutment was placed (OCO Biomedical) to develop the tissue emergence profile (Fig. 12, top).

The impressions were sent to the dental lab (Precision Ceramics, Montclair, Calif.), and a soft-tissue stone model was created with the implant analogs within the model. The final restoration would be a custom anodized abutment and solid zirconia crown to be luted to the abutment. The soft-tissue model was digitally scanned and designed virtually (Fig. 13). The abutment was CAD/CAM milled, and then the zirconia crown was milled to fit the abutment (Fig. 14).

One month post-impressions, the patient again returned for delivery of the final components. Patient was anesthetized with the same protocol utilized at the prior appointments. Radiographs were obtained to verify the proper seating of the abutment into the implant (Fig. 15). After verification, the abutment screw was hand tightened and checked with the torque wrench for the manufacturer recommended 30 Ncm. The zirconia crown was cemented to the abutment utilizing BiCem (Bisco Inc.), and the prosthetics were complete.

The patient was seen for several post-operative appointments. At 7- and 10-month visits, photos demonstrate exceptional results with this paradigm shift in the treatment of non-reparable fractured maxillary cuspids in this cat (Figs. 16, 17).

Conclusion

Replacement of lost canines in felines allows the animals to maintain a better diet by helping them to better masticate food. This allows the animals to gain proper nutrients from food, which helps maximize overall health and lifespan. Additionally, as the animals are able to chew normally, the authors believe they have a better psychological well-being, leading to a happier animal and overall better quality, and ultimately, quantity of life.

Digital treatment planning has made a dramatic change in the way dental implants can be incorporated into our canine and our feline patients. This provides easier treatment by the practitioner yielding a superior product as compared to traditional methods previously utilized as discussed in Case 1. As with human patients, treatment options need to be provided with the animal’s owner making the final, informed decision on care to be rendered.

References are available upon request from the publisher.
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Members of the dental profession are an increasing target for professional negligence lawsuits, and dental implant professionals are no exception. At February’s Academy of Osseointegration (AO) Annual Meeting, Dr. Michael Ragan will address this and more in the Young Clinicians’ Lecture Series: “Reducing the Young Clinicians’ Legal Exposure and Protecting Your License to Practice.”

One important and fundamental action can protect dentists from lawsuits and actions against their license to practice: practitioner-patient communication in the form of informed consent.

Ragan — a dentist who has practiced law for more than 25 years, exclusively defending health-care professionals — states that nearly 100 percent of lawsuit complaints include a count alleging that the doctor didn’t secure sufficient informed consent.

His presentation will address how comprehensive informed consent can help prevent exposure to a malpractice lawsuit and also the possible revocation of a clinician’s state license. Additionally, Ragan will address other areas of concern that impact the young clinician, including:

- Employment contracts and office leases
- HIPAA, HITECH and breach of confidentiality
- Cyber liability and social media
- Practice due diligence
- Fraud and abuse, deceptive trade practices
- Corporate practice of dentistry and fee splitting
- Delegation of personnel duties

Most importantly, he wants attendees to understand that patients need to know — with no conflict in their mind — what their alternatives are and what “bad things” can happen as a result of their implant procedure.

“A great percentage of claims may not reflect a specific act of negligence,” he said. “Most derive from a breakdown of communication.”

One common communication problem occurs when the patient is not made aware of possible side effects for the procedure or complications that could have long-term effects. Other times the breakdown can occur when the patients don’t understand their responsibility to the success of the implant.

This responsibility can be as simple as oral hygiene requirements or as complicated as the management of a systemic health condition that has consequences for the success of the implant.

The responsibility for communication of this vital information to the patient is the clinician’s, and without documentation of its occurrence, the doctor is at risk of a malpractice claim and a possible action against his or her license.

“When you increase the scope of clinical dental practice, there is a concomitant increase in practitioner responsibility,” he said. “Informed consent is more than a piece of paper. It’s a process.”

In addition to his defense law practice based in Miami, Ragan is on the faculty in the Department of Oral and Maxillofacial Surgery at Nova Southeastern College of Dental Medicine, as well as teaching at a number of other schools of dental medicine. Ragan also sits on the board of directors of the Fortress Insurance Company, a subsidiary of OMSNIC (the Oral and Maxillofacial Surgeons National Insurance Company).

The board members review thousands of claims every year to evaluate potential defensibility and exposure. While some of the claims they review are frivolous, some have merit.

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Implant Direct introduces smarter case approach with new system to streamline treatment coordination

Author: Implant Direct Staff

Implant Direct, a fast-growing major global dental implant manufacturer, has just expanded its portfolio of simply smarter solutions. SimplyIntegrated is a new versatile system enabling clinicians to easily tailor case treatment and coordinate with restorative partners.

The system consists of mount-free implants that can be paired with one of the treatment-specific prosthetic SMART PACKS. Both the implant and SMART PACK include the necessary components for that treatment phase — which means the clinician not only knows treatment costs upfront but can also practice more efficiently, according Implant Direct.

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The simplycrown & bridge SMART PACK for single or multiple tooth replacement includes a straight titanium abutment, abutment analog, plastic transfer, castable coping, comfort cap and fixation screw.

The simplyfixed SMART PACK for fixed hybrid restoration includes a screw-receiving abutment, abutment analog, transfer, titanium temporary abutment, comfort cap and the requisite fixation screws. This SMART PACK offers straight as well as 15-degree and 30-degree angled options. Additional SMART PACKS, simply removable for removable overdenture procedures and simplydigital for CAD/CAM restorations, will be available later this year.

To learn more, please visit www.implantdirect.com. You can also call (888) 649-6425 to speak with an Implant Direct customer service representative.

About Implant Direct

Implant Direct, a global dental implant manufacturer, offers a broad range of surgical, prosthetic and regenerative solutions as well as implant dentistry training courses. The company provides high-quality products with design advantages and simplified procedures at value-added prices in more than 60 countries worldwide.

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Immediate tooth replacement with the Hahn Tapered Implant and BruxZir Anterior Solid Zirconia

Author _Timothy F. Kosinski, DDS, MAGD

With more patients seeking dental implant treatment, it’s no surprise that a growing number of clinicians are providing this service. The increased demand for implant therapy can be attributed in part to the improved predictability brought about by innovations in implant design. Additionally, due to advancements in all-ceramic restorative materials, providing esthetic results is easier than ever before. By utilizing the most advanced implants and restorative materials, even experienced implantologists have the potential to benefit from an improved clinical workflow and more esthetic results.

The case report that follows demonstrates immediate tooth extraction and placement of a Hahn Tapered Implant (Glidewell Direct; Irvine, Calif.) in the area of a lateral incisor. A temporary bridge, custom implant abutment and a highly esthetic final crown are utilized to facilitate a natural-looking final restoration.

_Case report_

A 40-year-old male presented with no medical complications and desired a nice smile for his business interactions. His maxillary left lateral incisor had fractured, with the patient’s excessive parafunction likely a contributing factor. Endodontic evaluation had determined that the lateral incisor was untreatable. The patient accepted a treatment plan in which the lateral incisor would be extracted and an implant immediately placed. Designed to achieve the maximum primary stability needed for immediate extraction and implantation cases, a Hahn Tapered Implant was selected for the procedure.

To begin treatment, the non-restorable lateral incisor was extracted atraumatically. Removing the tooth in this manner maintained the facial plate of bone as well as the interseptal bone that helps support the interdental papillae. A pilot drill was utilized to create the initial osteotomy approximately 3 mm apical to the adjacent cementoenamel junction, and a 3.5-mm-diameter Replace Select™ drill (Nobel Biocare, Yorba Linda, Calif.) was used to complete preparation of the implant site. Note that the Hahn Tapered Implant is compatible with widely used surgical instrumentation.

As the implant was threaded into place, its prominent buttress threads engaged the palatal wall firmly. This simplified the effort of preserving the facial plate and positioning the implant in a manner that would foster an esthetic outcome. The tapered body of the implant eased placement within a maximum amount of bone, and its widened apex helped establish excellent stability.

Radiography confirmed the implant was placed in an optimal position. A transitional bridge was fabricated to minimize speech problems, help support the soft tissue and maintain a natural emergence profile during the healing period. After four months of healing, the temporary bridge was removed and an open-tray final impression was taken.

An Inclusive® Zirconia Custom Abutment with titanium base was produced by the lab and maintained a natural emergence profile upon delivery. BruxZir® Anterior, a monolithic zirconia material specially formulated for the smile zone, was chosen for the final restoration because of its strength and lifelike esthetics. The crown, which was digitally designed and milled using CAD/CAM technology, exhibited a precise fit. Final radiography illustrated superb bone preservation at the implant site (Fig. 1). Optimal soft-tissue contours were particularly evident around the beveled edge of the Hahn Tapered Implant. The patient was very pleased with the final restoration (Fig. 2).

_CoIlusion_

The high primary stability, optimal positioning and simplified surgical protocol facilitated by the Hahn Tapered Implant make it ideal for a wide range of indications, including immediate extraction cases and restorations in the smile zone. When combined with BruxZir Anterior and zirconia hybrid custom abutments, a predictable restoration can be delivered that mimics the esthetics of the tooth being replaced.

See more of this case by visiting www.inclusivemagazine.com.
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Hybrid Pin System - developed with Dr. Istvan Urban

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At a glance
- Easy pin placement even in dense cortical bone
- Removal of pins made simple with pin holder
- Fixation of membrane with titanium pins
- Kit complete with 34 pins

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