

Top Implantology BREAKTHROUGHS for the GP

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with a special contribution by Ryan Swain, DDS

Abstract

This course is designed to load the general practitioners arsenal with multiple minimally invasive techniques that can be implemented immediately. Not only do the techniques increase the level of patient care but add significant increase to the productivity of the general practitioner. Multiple case studies are used to demonstrate no-drill implants, the five-minute implant, abutment and crown and the top five flapless techniques used by GPs in today's implant-gearred practice.

Educational Objectives

At the end of this program participants will be able to:

1. Identify the suitable clinical situations for and learn to complete the five flapless/sutureless soft-tissue surgical implant access procedures (to include the direct, high-speed handpiece, tissue punch and mini-envelope procedures).
2. Identify situations that lend themselves to the clinical application of the "no-drill" implant procedure.
3. Be able to identify clinical situations where an implant can be predictably placed into the site of a freshly extracted tooth without the use of a drill.
4. List several implant final prosthetic techniques that reduce the overall number of appointments necessary and minimize rework.
5. Define specific marketing medium and specific ads to place in that medium to vastly increase new patient flow and ultimately place more implants.
6. Understand why short-term orthodontics is an ideal accompaniment to efficient implants in the GP practice.

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Garrett Gunderson recently stated in a lecture to general dentists, “leveraging hot topics in your practice is one of the top ways to build business equity.” I think that we would all agree that implants, particularly minimally invasive/efficient techniques, are at the pinnacle today. This article is an exploration of the ever-increasing arsenal of implant efficiency techniques available to the general practitioner. The most popular protocols are demonstrated through the selection of several case studies.

Case Study: Four maxillary implants and a fixed-detachable hybrid bridge with mandibular implants site #19 and #30

Dental implant techniques and technology have been evolving at a similar rate to what has been witnessed in the PC and smartphone market over the last few years. Dental implants have become much less invasive and more efficient causing this procedure to be the most talked about and hottest topic in dentistry from both a patients’ and clinicians’ perspective. This case study will highlight multiple efficiency techniques that you will be able to incorporate into your practice right away. If you add these techniques to your practice you will recognize great value from both a time savings and overall patient comfort perspective.

The patient presented with an ill-fitting maxillary denture and a mandibular distal-extension partial that had not been worn in months due to discomfort (Figs. 1 & 2a). The patient had a moderate gag reflex, which prevented the upper denture from being worn comfortably. The distal third of the palate had been removed in an attempt to relieve the gag reflex. The patient elected for a treatment plan, which involved replacement of the upper denture with a fixed-detachable hybrid bridge to be screw-retained and supported by four maxillary implants. The lower treatment plan involved replacing the existing partial with implants, teeth numbers 19 and 30. All implant procedures and final prosthetic impressions were completed in a 90-minute appointment.

Efficiency Technique Highlight: Sizing and angling the implant to utilize available bone rather than manipulating the bone through grafting procedures to accommodate a certain sized implant. Recent advances in implant stability at the time of insertion have allowed implantologists to choose an implant size in relation to available bone rather than manipulating the bone via grafting procedures.⁵ (In fact, a recent study of 14,722 placed between the years 1980 and 2009 demonstrated that “There was no statistically significant difference between the failure rates of short dental implants and standard implants or between those placed in a single stage and those placed in two stages (multivariate analysis).” So basically they found that implants shorter than 10mm placed in a one-stage approach show no difference in success rate. This allows a clinician to confidently place a maxillary 8mm implant in an area of 8-9mm of bone height rather than a sinus lift and bone graft to accommodate a longer implant. This has allowed implant

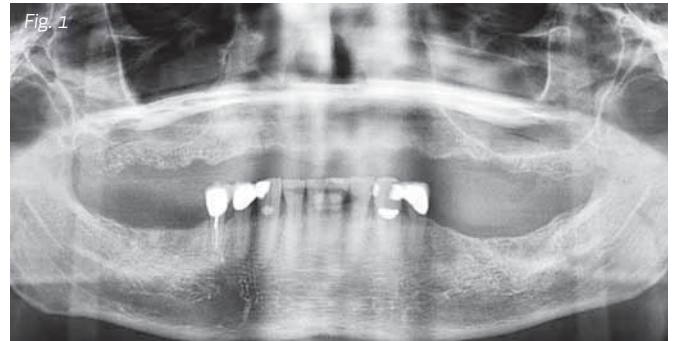
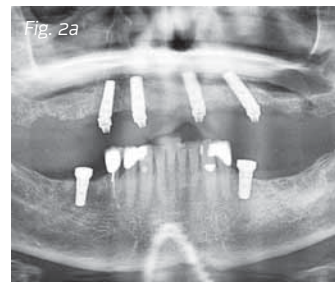


Fig. 1: Pre-op pano.

Fig. 2a: Post-op pano immediately after implant placement.

Fig. 2b: Two appointment implant, abutment and crown.



dentistry to be minimally invasive and achieve new levels of efficiency within the general dentistry practice. In this particular case there is very shallow bone height just inferior to the maxillary sinus as demonstrated on the PAN. There is more than sufficient bone just medial of the inferior wall of the sinus. An implant placement following the angle of the wall of the sinus will allow for enough bone to place 4.7 X 13 implants. This saves both the clinician and patient additional appointments needed to recover from more invasive sinus grafting surgery, thus, greater efficiency. On the mandible, 4.7mm X 10mm length implants were selected. Even as little as 8mm of available bone height (to accommodate an 8mm implant) has been demonstrated in numerous studies to be sufficient to maintain a 97 percent success rate. A 2009 study published by the *Journal of Oral and Maxillofacial Surgery* concluded: “Placement of short dental implants is a predictable treatment method for patients with decreased posterior mandibular bone height.”¹ To demonstrate the efficacy of short implants on the maxillary arch (Fig. 2b) is a post pan of implant, abutments and crowns #13, #14 and #15. The distal abutment, #15, on a bridge spanning #13-#15, is lost due to a combination of secondary decay and periodontal issues. Not long ago the preferred treatment for most would have been extraction of #15 and a sinus lift/bone graft procedure to create enough vertical bone for 10-13mm implants to be placed. A simplified approach

1. *J Oral Maxillofac Surg.* 2009 Apr;67(4):713-7. Outcomes of placing short dental implants in the posterior mandible: a retrospective study of 124 cases.
5. *Int J Oral Maxillofac Implants.* <http://www.ncbi.nlm.nih.gov/pubmed/21841992#> 2011 Jul-Aug;26(4):816-25. Failure rates of short (≤ 10 mm) dental implants and factors influencing their failure: a systematic review. Sun HL, Huang C, Wu YR, Shi B

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involves 5.7mm wide by 8mm long implants to avoid more extensive, expensive and uncomfortable sinus bone grafting procedures for the patient.

Most applications of “short implants” in the 8mm range include the maxillary and mandibular posterior areas where the sinus and mandibular nerve come into play. Armed with studies proving the efficacy of “short” implants, a general dentist does not need to flirt with anatomical structures to provide great, predictable patient care.⁵ Always staying 3-4mm away from the mandibular nerve and keeping the apex of the implant embedded in the cortical plate of the sinus are great protocols to avoid anxiety. In fact, I often speak of the 6mm rule when the mandibular nerve is in the same sentence. Human error can be up to 3mm so if you follow the 6mm rule and always try to stay that distance from the nerve then if human error occurs you have at least a 3mm safety zone.

Efficiency Technique Highlight: High-speed drill gingival access and initial pilot hole. Referencing the initial case study, the maxillary ridge was palpated to assimilate the alveolar ridge anatomy. This allowed for accurate entry points into the tissue to be determined. After deciding on the ideal entry points, a high-speed handpiece was used with a special long surgical bur (Fig. 3). Small circular movements were used to enlarge a hole through the keratinized tissue using the surgical high-speed bur and simultaneously creating a 5-6mm pilot hole in the bone to initiate the osteotomy. After all four tissue accesses were opened, a 2.3mm drill was used to create the initial full length osteotomy. The drill was buried to the length of 16mm to compensate for 2-3mm of gingival tissue. A pan was taken with the drill inserted to length to verify correct angulation and to ensure that the sinus cavity was not being encroached upon. After verifying correct position, the final osteotomies were created one drill short of the final drill to allow for greater bone compression and thus greater torque/primary stability. A 3.8mm drill is one short of the final 4.4mm, which is used for a 4.7mm diameter implant. All four upper implants were torqued to 40-60N/Cms (Fig. 4a). This technique is much less invasive than an approach involving a full thickness flap and also requires fewer appointments, thus, more efficiency. Please scan the following QR code with your smartphone or visit www.frankimplantprocedures.com/video1 to view a video.



Efficiency Technique Highlight: Creating a custom bar/framework template in mouth immediately after implant insertion with final bite, midline and inter-pupillary smile-line. Oftentimes at this stage in the procedure the clinician will place cover screws or healing caps over the implants and wait for several months. This efficiency technique involves initiation of the prosthetic process immediately after implant insertion. This technique is recommended when the implants can be torqued to a level of around 60N/cms. After insertion of the implants the transfers were removed and 18-

degree-angle correction multi-unit abutments were placed. The angled abutments were approximated to create a certain degree of parallelism but additionally to allow for the prosthetic screw to be accessed from the lingual of the anterior teeth and occlusally in the posterior. The multi-unit abutments used are able to accommodate an angle differentiation of up to 20 degrees. After achieving an acceptable angulation of the multi-unit abutments, castable copings that are generally used by the lab in fabricating the framework were screwed into the abutments (Figs. 4a & b). The castable copings were then adjusted using a high-speed to approximate the vertical dimension. After establishing the vertical, two strips of Triad light-cured custom tray material were cut from a sheet using a Barred Parker blade. The strips were approximately 5mm wide. The strips were then formed around the cast-able copings, one on the lingual and one on the facial/buccal. The material was palpated into the rough bar location based on visualization of the ideal position of the maxillary teeth. After light curing the material in the mouth, a blue-mouse was taken to relate the correct bite and vertical. A cotton swab was embedded into the blue-mouse to correlate the inter-pupillary smile line and the midline was marked. The screws were then removed from the cast-able copings and a pick-up impression was taken. This efficiency technique has saved both the patient and clinician several steps and created a more exact communication with the lab. In the past, frameworks and bars necessitated sectioning and oftentimes new impressions due to minute discrepancies in the final impression with implant analogs. Not so with this technique as



Fig. 3 Implant tray setup.

Fig. 4a: Implants in place with transfers.

Fig. 4b: Implants with abutments and lab castable copings immediately after implant placement.

all four implants are a fixed unit via the rigid light-cured acrylic (Fig. 5e).

Efficiency Technique Highlight: Utilizing a mini-envelope incision (flapless approach). After completing the upper final impression, the initial soft-tissue entry for implants site #30 and #19 was initiated. Due to a slight deficiency of keratinized tissue on the buccal aspect of the implant sites, a mini-envelope incision was chosen. This is basically a small slit made at the crest of the ridge to reflect a 4mm wide portion of keratinized tissue to the buccal. This will allow for a nice cuff of keratinized tissue around the implant. I use a sharp instrument commonly used for sculpting composite resin (Fig. 3). It works well for releasing the tissue from the bone and creating a small envelope. Next, a surgical bur in the high-speed handpiece was used to create a 4-5mm pilot hole in the cortical plate of the bone. Using this hole the osteotomies were initiated and completed to a length of 13mm from the gingival height. This allowed for 3mm of tissue, which accommodates a 4.7 X 10mm implant. Implants were placed and a final impression was taken for the prosthetic portion of the procedure (cemented porcelain fused to metal restorations). No sutures or flap saves both clinical time and an appointment as the final impression was taken immediately after implant insertion (Figs. 5a & b). In 2002 the *Journal of Oral and Maxillofacial Implants* published a study that concluded: "Flapless implant surgery is a predictable procedure if patient selection and surgical technique are appropriate."²

Figure 7 is a picture of mandibular posterior implants immediately after placement utilizing the mini-envelope incision. Note the ideal conditions for a final impression without bleeding or sutures. Please scan the following QR code with your smartphone



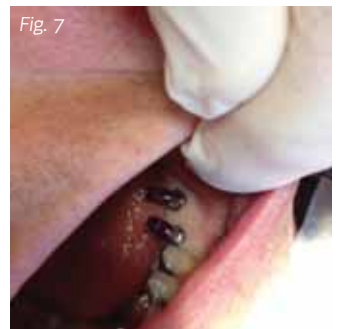
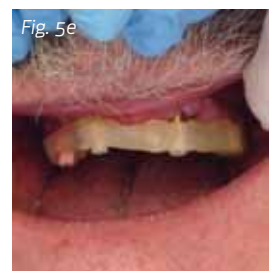
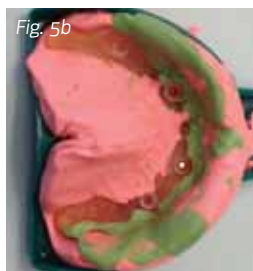
or visit www.frankimplantprocedures.com/video2 to view a video.

Efficiency Technique Highlight: Utilizing a 3-in-1 implant system. Several implant companies now provide the option of 3-in-1 systems to their customers (Fig. 3). This basically means that the implant body, a customizable abutment and a transfer all come attached to one another in the same package. This provides efficiency because the clinician does not need to track down numerous small parts. Also, the impression for final prosthetics can be taken seamlessly immediately after implant insertion with a very accurate closed-tray impression technique. As the implant is being inserted it is very easy to visualize the ideal placement of the margin of the final abutment. Simply screw down the implant until ideal margin in relation to the tissue is achieved. Not only is this technique efficient, but also is very overhead friendly.

Efficiency Technique Highlight: Taking the final prosthetic impression and bite immediately after implant placement during the same appointment.

As has been mentioned, the final prosthetic impressions for both arches were taken at the end of the surgical stages for both arches. The next appointment is the final seat appointment for both the upper and lower restorations in 30 to 90 days (Figs. 6a & 6b). Is early loading OK? In 2007 the *Journal of Oral Maxillofacial Implants* published a study that concluded: "Early loading of endosseous dental implants placed in healed ridges offers select benefits to clinicians and their patients."³ Final restorations seated approximately one month after implant placement showed a 97 percent success rate as long as a torque greater than 40N/cm was achieved. In the case pictured of an

2. *Int J Oral Maxillofac Implants.* 2002 Mar-Apr;17(2):271-6. Flapless implant surgery: a 10-year clinical retrospective analysis. Campelo LD, Camara JR.



Figs. 5a-e: Chairside pre-lab prosthetic procedures.

Figs. 6a & b: Wax try-in of maxillary full arch.

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upper left quadrant bridge (Figs. 8a-d), the final impression was taken immediately after implant placement and was seated three weeks later. The stock abutments that come with the implant were actually prepped and used as final, customized abutments. I have found it is much more efficient and accurate to customize your own abutments chairside with a diamond bur rather than utilizing lab fabricated customized abutments. Please scan the following QR code with your smartphone or visit www.frankimplantprocedures.com/video3 to view a video.



Case Study: No-Drill Implants with an Osteoconverter

Efficiency Technique Highlight: Immediate placement of an implant into a fresh extraction site, particularly no-drill implants. This involves the extraction of a compromised tooth and the immediate placement of an implant without the use of a drill. The procedure is atraumatic and predictable. Why is this procedure preferred to using a drill in the fresh extraction site? The drilling action can fracture fragile bone around the extraction site or remove thin buccal/facial bone, which would ideally be retained around the implant. The Osteoconverter acts to expand the extraction site while keeping wanted bone intact. The Osteoconverter also scores the internal aspects of the extraction site in roughly 1mm increments, which increases blood flow to the implant interface. This improves osseointegration and provides bone expansion, which converts the irregular root circumference into a shape that is accommodating to the implant. The Osteoconverter has a flat end much like an osteotome so in areas just inferior to the maxillary sinus, it gently converts the socket site without damaging the fragile sinus floor (Fig. 9a). The Osteoconverter also serves as a measuring device; once the socket site has been converted, a simple measurement is made in order to select the correct size implant (Figs. 10a-c).

It certainly sounds nice to avoid picking up a drill when placing implants, but what are some contraindications to this procedure? Perhaps the most common is acute infection around the apex of the tooth. Experienced implantologists often clean out the infected area and place the implant directly into the area that had infection. In fact, the *Journal of Periodontology* published a study in 2001 with the following conclusion: "The present study shows that when a screw-type dental implant is placed without the use of barrier membranes or other regenerative materials into a fresh extraction socket with a bone-to-implant gap of 2mm or less, the clinical outcome and degree of osseointegration does not differ from implants placed in healed, mature bone."⁴ Therefore the use of bone grafting materials or membranes is not necessary for superior outcomes. Interestingly the majority of the teeth had long-term infection associated with the tooth. It has been found that implants are very resistant to infection in socket sites due to the fact that bacteria cannot feed on titanium so once the source of the infection is gone, the tooth, the area is quickly exterminated of remaining bacteria by killer T-cells and lymphocytes. What if the root is too short to place what you think to be an ideal-sized implant? Drilling beyond the apex for a sufficient length with the pilot drill will solve that issue. In these cases it is prudent to underprepare (use one size smaller drill) beyond the apex and use the Osteoconverter to convert the site. This will assure primary stability and an excellent success rate. If the apex of the socket site is right against the floor of the sinus, like many are, the Osteoconverter will gently push against the sinus floor and allow for the apex of the implant to be even with the floor

3. *Int J Oral Maxillofac Implants.* 2007 Sep-Oct;22(5):791-800. Three-year evaluation of single-tooth implants restored 3 weeks after 1-stage surgery. Cooper LF, Ellner S, Moriarty J, Felton DA, Paquette D, Molina A, Chaffee N, Asplund P, Smith R, Hostner C.
4. *Immediate Implantation in Fresh Extraction Sockets. A Controlled Clinical and Histological Study in Man:* Dr. Michele Paolantonio, Marco Dolci, Antonio Scarano, Domenico D'Archivio, Giacinto Di Placido, Vincenzo Tumini, Adriano Piattelli, *Journal of Periodontology* Vol. 72, No. 11, 1560-1571 (Volume publication date: November 2001) DOI: 10.1902/jop.2001.72.11.1560

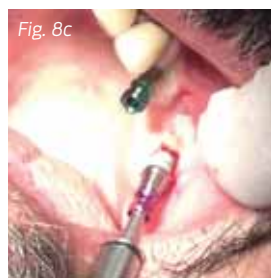
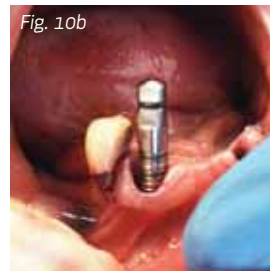


Fig. 9: OsteoConverters by OsteoCore Dental Implants.



Figs. 10.a-c: Atraumatic extraction of #27 and immediate placement of implant.

of the sinus or less than 2mm. The cells between the sinus membrane and bone on the sinus floor are highly bone-forming. This will provide for bone at the apex of the implant. This pano of full maxillary extractions and four implants with locator abutments to retain an upper prosthesis was placed without the use of a drill (Figs. 11a & b). OsteoCore implants may be inserted without the use of an Osteoconverter.

Case Study

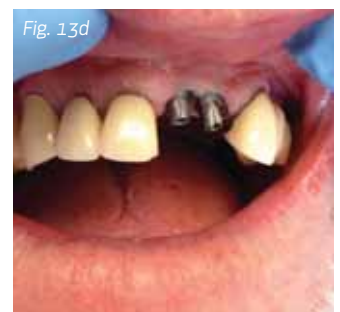
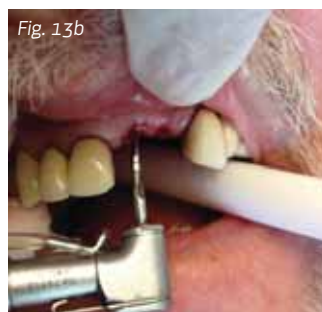
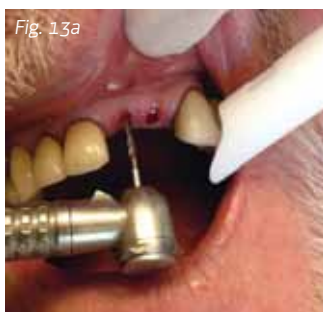
Efficiency Technique Highlight: Short-term ortho and implants. The recent expansion and availability of short-term orthodontics in the GP practice has opened up a great deal of opportunity from an implant standpoint. Just five years ago the average length of time needed to complete an ortho/implant comprehensive case was two to three years. Today, with proper education on short-term ortho and efficient 3-in-1 implant systems, ortho/implant cases can be completed in as few as seven months. The referenced case study to demonstrate this point is contributed by Dr. Ryan Swain. The dual objective in this case was to efficiently correct anterior spacing and additionally create an ideal amount of room to restore congenitally missing #24 and #25 with implants, abutments and crowns. The orthodontic phase of treatment was completed in six months (Figs. 12a & b). A minimally invasive approach to the implant surgery involves mini-envelope incisions, one-drill (narrow-body) implants and a final impression for the crowns immediately after

implant placement. One huge advantage to the short-term ortho approach as it relates to implants is that the bone does not have time to resorb after a tooth is dragged through the area via bodily movement. Thus, implant surgery is idealized with more available bone width.

The similar case below demonstrates the placement and restoration of implants in an anterior area of partial edentulism. In figures 13a-d, you'll see the high-speed handpiece soft-tissue approach and initial pilot hole. Just prior to this bone sounding was performed with an anesthetic needle and a perio probe. Final drill was used and implants were placed to bone level. After placement, abutments were customized chairside and Expasyl retraction was used just prior to a final impression being taken. In this case, crowns were permanently cemented in 30 days.

This approach and most of the others were simply not options to the implantologist just three to five years ago. This is a huge benefit to patients and clinicians alike as treatment times are vastly reduced and clinical success rates are increased. Join the growing trend of general dentists today who have embraced implant efficiency and watched their practices reach new levels both financially and from a professional satisfaction standpoint.

If you would like more information about the topics covered in this article or would like to view upcoming Implant Efficiency Institute training programs, please call 541-864-0312, go to www.osteocoredentalimplants.com or e-mail info@osteocoredentalimplants.com. ■



Figs. 11a & b: Four extractions and four implants placed using the No-Drill Implant Procedure

Figs. 12a & b: Pre- and post-short-term ortho treatment to set up for implants
Figs. 13a-d: One appointment implant, abutment, and crown impression

Author's Bio

Over the last 10 years, **Dr. Brady Frank** has owned and managed multiple practices. Dr. Frank has addressed thousands of dentists at popular seminars throughout the country including Excellence in Dentistry, Phasing-Out Seminars (over 20 presentations delivered), and Schein/Camlog Seminars. Dr. Frank's topics include Implantology, Dental Transitions and Entrepreneurial Satellite Practice Ownership.



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