Implant News & Views

"Keeping you up-to-date on implant dentistry"

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IN THIS ISSUE

Use of Innovative Physics Forceps for Extractions in Preparation for Dental Implants

Timothy Kosinski, DDS, MAGD

Immediate placement of a dental implant following extraction is primarily possible when the tooth is removed without complication or damaging of the facial plate of bone. Removal of teeth using conventional elevation and forceps involves the separation of the periodontal ligament attachments, expansion of the alveolus and lifting of the tooth out of the socket with the forcep beaks. The forcep works by forces placed equally on the facial and lingual portion of the tooth and the movement of the arm and wrist, thus elevating the tooth out of the socket. These forces sometimes lead to fractured roots which must be carefully elevated out of the socket, or fracture of the buccal plate leading to a potentially significant facial defect.

Excessive force may lead to damage which prohibits immediate placement of a dental implant. Also, many patients are aware of the force and trauma created by conventional extraction techniques. The physical trauma to the patient is only exceeded by the negative psychological effects. Patients expect the worst during an extraction, especially in those teeth which may be inflamed, broken down or difficult to remove.

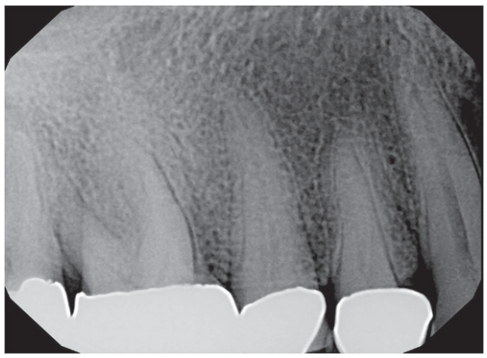


Figure 1: Periapical radiograph of infected maxillary right first molar. Endodontic evaluation indicated that the tooth was not salvageable.

Physics Forceps

The Physics forceps, created by Dr. Richard Golden, are an innovative tool that I have found to be profoundly beneficial to my practice. Not only am I able to predictably remove even the most grossly broken down teeth with little or no trauma to the surgical site, the patients are remarkably impressed by the ease of the procedure. The biomechanical design of this instrument allows me to minimize the fracture of roots and maintain the buccal plate, which is essential to the proper healing of an immediately placed dental implant.

The forcep acts as a simple first class lever. Force is applied with the beak on the lingual or palatal aspect of the root structure and another force is applied with the "bumper" design placed on the alveolar ridge at the position of the mucogingival junction on the facial aspect of the tooth[1]. The forcep is squeezed between the fingers with minimal force. My grip is so minimal that the instrument could be easily removed from my hand if you wanted. A steady rotational force is created by simply rotating the wrist at very small increments. The key to the technique is that the forcep cannot

be used like a traditionally designed forcep, meaning there is no arm force used to elevate the tooth out of the socket. My experience is that it may take a minute or two of minimal rotational force of my wrist in very small increments to remove the tooth. This is opposite of everything we have been taught about extractions in the past. We need to slow down, prevent squeezing of the instrument and let the rotational forces "pop" the tooth out of the socket.

Case 1 [Figures 1-12]

The patient presented with a symptomatic maxillary right first molar tooth. Endodontic and radiographic evaluation indicated a fractured root. The decision was made with our patient that extraction of the tooth would be completed and the socket site grafted for future implant placement.

Figure 2: Maxillary molar teeth can often be removed in total without sectioning. The palatal portion of the root is flattened subgingivally with a bur. This allows a stable purchase point for the beak of the Physics forcep.

Figure 5: The maxillary right first molar as it looked upon removal.

Figure 8: The patient's blood is mixed with Tri Calcium Phosphate crystals which will be used to graft the socket site in preparation for future dental implant placement. Because of the position of the three maxillary sockets, it is often difficult to immediately place a dental implant in ideal position.

Figure 3: The beak of the forcep is engaged subgingivally on the palatal side of the tooth to be extracted. The "bumper" is positioned on the facial aspect of the tooth on the alveolar ridge at the approximate position of the mucogingival junction.

Figure 6: It was clear that the apex of the root was indeed fractured and was easily separated. The entire root and fractured piece came out in total for an atraumatic, simple extraction.

Figure 9: The graft/blood mixture is placed into the socket.

Figure 4: The tooth "pops" out of the socket. Another instrument like a bird beak pliers is used to remove the disengaged root from its socket.

Figure 7: Blood is syringed from the socket site with an insulin syringe.

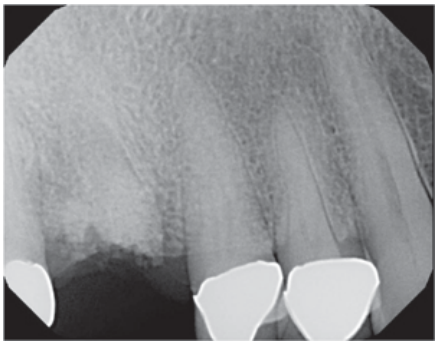


Figure 10: Post operative radiograph of the graft material in place.

Each time I use the Physics forcep, my natural response is, "this is magic." My patients are equally impressed on how simple the procedure was completed, without trauma and without the intense sensations of conventional extraction techniques. Facial bone is protected from fracture by the compressive force applied by the "bumper" placed on the alveolar ridge at the position of the mucogingival junction. Once the root structure is released from the socket, an instrument like a hemostat or needle nose pliers, is used to remove the tooth entirely.

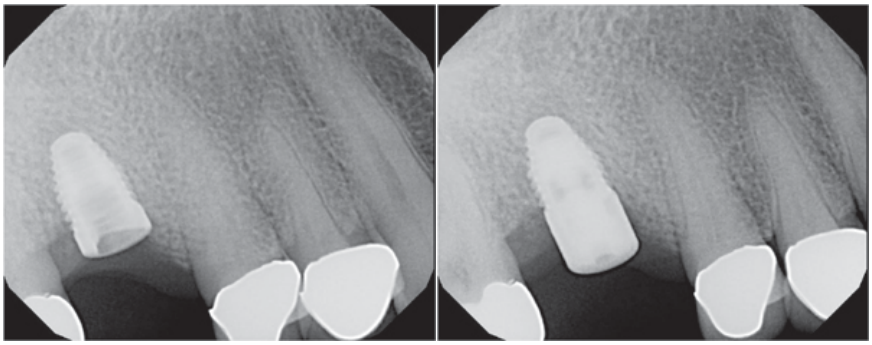


Figure 11-12: After integration of the grafted site, a dental implant was placed and allowed to heal.

Technique

The extraction of a tooth using the Physics forcep is similar to the removal of a nail from wood using a hammer versus a pair of pliers[2]. Just envision this process for a moment. You could also think of a bottle opener. Certainly the cap of a bottle can be removed in various ways. You could take a pair of pliers and try to pry the edges of the cap off, creating much damage to the cap. You could force the cap off by applying blunt pressure at the edge of a counter. Taking a bottle opener makes the process simple, with very little physical arm force needed. Rather the forces applied are from the wrist and rotational in nature. The rotational force is magnified by the length of the hammer handle or the bottle opener's handle, which elevates the nail out of the wood or removes the bottle cap.

The Physics forcep can be utilized for atraumatic extractions where bone needs to be preserved and root fractures would only complicate a situation. Elevation of the tooth is no longer required as the instrument itself stretches and eventually breaks the periodontal ligament fibers, allowing easy removal of the tooth. The firm yet not excessive rotational forces applied to the periodontal ligaments are shear in nature. The lingual plate expands, and the compressive forces placed on the facial aspect by the "bumper" prevent facial bone fracture.

The constant pressure applied to the tooth by the design of this forcep leads to chemical changes in the periodontal ligament and the subsequent release of the Sharpey's fibers. When the PDL is traumatized, hyaluronidase is released. Once the chemical breakdown of the PDL by hyaluronic acid is sufficient, the tooth is released from its attachment to the alveolus and is removed.

Figure 13: Pre-operative periapical radiograph illustrating a fracture at the height of the post preparation in this root canal treated tooth #9.

Case 2 [Figures 13-34]

This patient presented with a symptomatic root canal treated maxillary left central incisor. It was determined that the root structure had fractured, requiring extraction. If the tooth can be removed atruamatically, we considered immediate placement of a single dental implant.

Figure 14: Pre operative view of non treatable maxillary left central incisor.

Figure 15: The existing crown was easily removed, leaving a root with significant decay subgingival.

Figure 16: The palatal portion of the root is flattened subgingivally to establish a purchase point for the beak end of the Physics forcep.

Figure 19: The intact root is simply removed from the socket site easily and atraumatically.

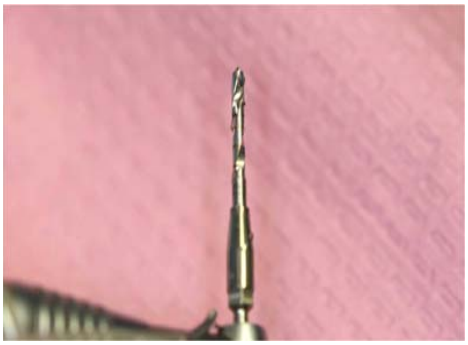


Figure 22: A pilot drill is used to determine angulation and depth of the implant. A radiograph will help in determine ideal position. The implant needs to be placed slightly palatal to the existing socket and slightly palatal to the incisal edges of the adjacent teeth. Also, the implant should be positioned approximately 3mm from the facial plane of the existing teeth and at least 2mm from the adjacent root structures. Depth is slightly longer than the apex of the socket so that solid bone is engaged.

Figure 25: The blood/tricalcium phosphate mixture is placed into the socket site to fill in any voids prior to implant placement.

Figure 17: The Physics forcep beak engages the palatal aspect 3-5 mm subgingivally and the bumper aspect is positioned on the facial aspect. This is an ideal circumstance for use of the Physics forcep since maintaining the facial plate of bone is critical to immediate placement of a dental implant.

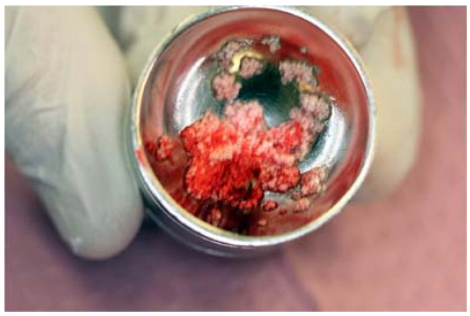


Figure 20: Blood is taken from the socket with an insulin syringe and mixed with Tri Calcium Phosphate crystals.

Figure 23: The next diameter preparation bur widens the osteotomy.

Figure 18: The root actually "pops" when it is released from the socket, making removal simple with needle nose pliers.

Figure 21: Prior to implant size determination, the tooth is measured using one of the implant preparation burs. Both length and width of the implant to be used can be determined by the root size.

Figure 24: The final diameter preparation bur creates a site ideal for implant placement.

Figure 26: The implant is torque into proper position.

Figure 27: A guide pin is used to demonstrate that the implant is indeed in ideal position to maximize final esthetics and emergence profile of the final implant retained crown.

Figure 28: A healing abutment is placed into the implant body.

Figure 29: A resorbable barrier is positioned to the labial aspect to prevent tissue invagination.

Figure 30: The surgical site is sutured closed with Vicryl.

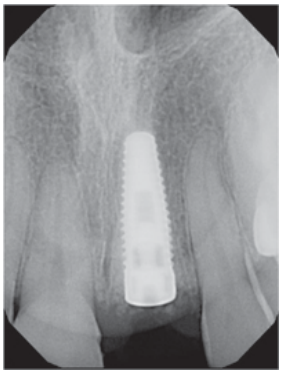
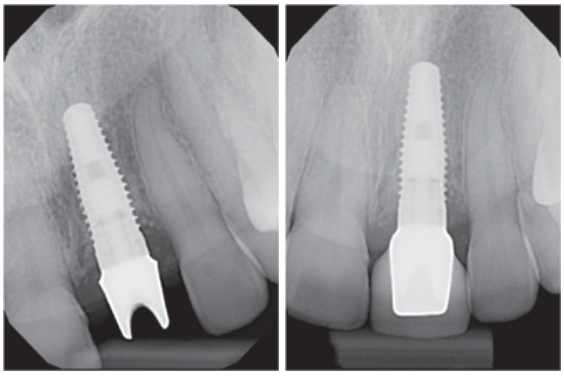


Figure 31: Periapical radiograph of the implant in position.



Figures 32-33: Periapical radiographs of Zirconia abutment in position and the final implant retained crown.

Case 3 [Figures 35-42]

Our patient presented with gross decay of the gingival maxillary right and left central incisors. Here the decayed roots would be atruamatically removed using the Physics forceps and five dental implants immediately placed.

Figure 35: Periapical radiograph of non restorable maxillary right and left central incisors.

Figure 36: Occlusal view of ridge. Note the gross subgingival decay of the existing root structures.

Figure 34: Smile of the final implant retained crown in position.

Figure 37: The beak of the Physics forcep engages the palatal aspect of the root 3-5mm subgingival and the bumper is placed of the facial aspect.

Figure 38: This view demonstrates the minimal amount of finger pressure used. The wrist is rotated towards the facial with little or no arm strength.

Figure 39: The root disengages with a "pop" maintain the facial plate of bone.

Figure 40: The root structure was actually quite long and the extraction was atraumatic to the patient and created an ideal socket site for immediate dental implant placement.

Figure 44: Gross decay of the root structure indicates the potential differential diagnosis of an immediate dental implant.

Figure 45: The beak of the Physics forcep engages the lingual portion of this small root approximately 3-5mm subgingival with the bumper engaging the labial aspect of the root; the root simply "pops" out of the socket. This is really a magical event since it is atraumatic to the patient, maintains the integrity of the facial bone, and takes a matter of a minute. No damage to the adjacent tooth structures occurs, which may not necessarily be the case if conventional elevation and forcep extractions were done.

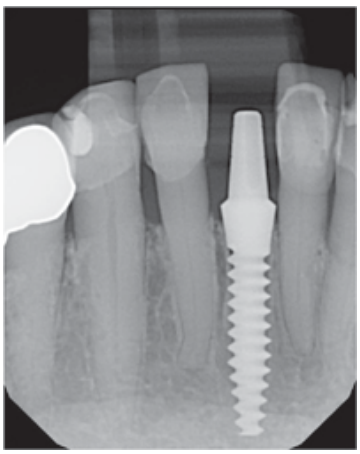
Figures 41-42: Five dental implants were immediately placed, including placement in the socket sites created by the extraction of teeth using the Physics forceps.

Case 4 [Figures 43-48]

This patient presented as a dental emergency following fracture of the coronal portion of root canal treated mandibular right central incisor. The tooth was fractured to the gingival and would require extraction. Immediate dental implant placement was considered.

Figure 43: The coronal portion of an old root canal treated tooth fractured.

Figures 46-48: An immediate dental implant is placed into the socket site and a transitional composite crown placed. All this is done as an emergency visit in minutes.



Case 5 [Figures 49-58]

Our patient requested dental implant placement on a grossly decayed maxillary left second bicuspid tooth. The Physics forceps would be used to simply remove the root without damaging the buccal plate. This allowed for immediate placement of a dental implant into the prepared socket site.

Figures 49-50: Periapical radiograph and occlusal view of grossly decayed maxillary left second bicuspid.

Figure 51-53: The Physics forcep beak engages the palatal portion of the root 3-5mm subgingival, two fingers and a thumb hold the forcep in position and the wrist is rotated to the facial, which results in the decayed root "popping" out of the socket.

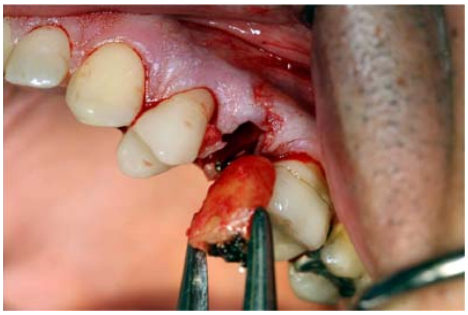


Figure 54: A needle nose pliers simply removes the intact root from the socket maintaining the facial plate completely.

Figure 55: The root structure is measured for depth and width and the proper size dental implant is selected.

Figure 56: An implant is torqued into position.

Figure 57: A panoramic radiograph is taken to illustrate ideal position of the immediately placed dental implants.

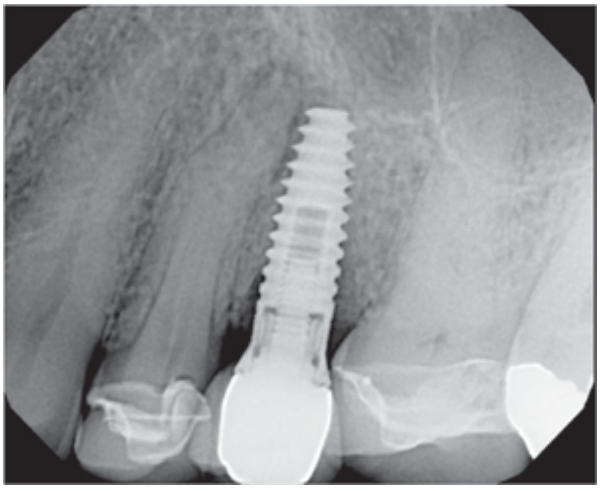


Figure 58: Periapical of the final implant retained crown.

Case 6 [Figures 59-73]

This patient presented with a symptomatic and fractured two rooted maxillary left cuspid tooth, which demonstrated significant infection on the distal aspect of the root radiographically. The tooth would require extraction. The apical portion of the root was indeed fractured as is demonstrated, but the entire tooth fracture included, was removed in total using the Physics forceps. The procedure was atraumatic to the patient. The defect was grafted and an immediate dental implant placed without complication.

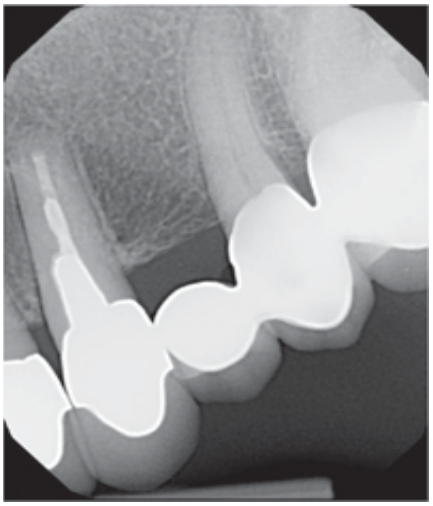
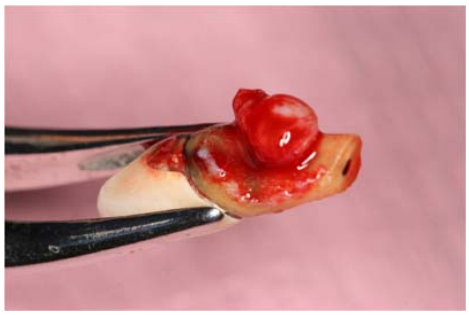


Figure 59: Periapical of infected, fractured maxillary left cuspid.

Figure 60: Maxillary cuspid crown.

Figures 67-68: The osteotomy site is created with different diameter preparation drills.

Figures 61-63: The Physics forcep beak engages the palatal surface of the root 3-5mm subgingival and rotated with slight wrist pressure for approximately 1-2 minutes. The root "pops" and is easily removed.

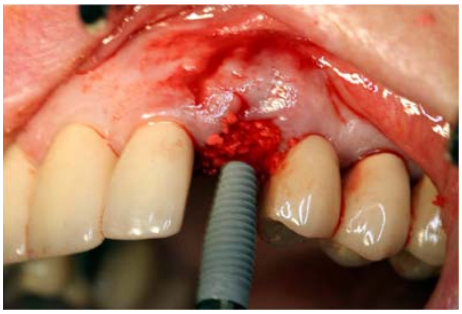


Figures 64-65: A needle nose pliers is used to easily remove the root from its socket.

Figure 66: The entire granulomatous mass was removed with the atraumatic extraction of the cuspid tooth. The root is measured and the proper length and diameter implant is chosen for an immediate placement of a single dental implant.

Figures 69-71: Since there is a defect created by the granulomatous mass, blood is harvested from the socket site and mixed with Tri Calcium phosphate material and carried to the socket site.

Figure 71.



Figures 72-73: The implant is carried to the surgical site and positioned ideally in the bone.

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1. Golden, R. "Less Than Four Minute Extraction of Any Tooth." www.dentistrytoday.com/oral-surgery-00/5991. 12/3/2011. 1-6.
2. Misch,C. and Perez, H. "Atraumatic Extractions." Dentistry Today. Vol. 27. No.8, Aug. 2008. 1-3.

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Tidbits
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Online Discussion Groups

We try to monitor various online discussion groups to share their views on implants with our readers. We found a great group with a wealth of ideas on **LinkedIn**. To learn about the benefits & how to join, go to **http://www.linkedin.com.** The group is called **Dental Implant Professionals** and has over 4,000 members. You need to apply, but it's free membership. Here's a recent disscussion about how to get started and choose an implant system.

Makarov Aleksandr
How do you choose an implant system to work with? What are the criteria to chose implants and how much do you have to know about implant structure, surface and so on...?

Jochen Konneker
There are many factors to consider. No system is perfect. Go to **genieoss.com** and look under surgeon-implant design. There you will find information about the most important features for implants.

Jo Ann Pulver
As a speaker for dental implant companies for the past 15 years, I have seen the most success regarding the selection of a dental implant system when the general dentist confers with his/her Oral Surgeon or Periodontist. It is important that this discussion remain between the dental professionals and not enter into the "selling" process with patients. The discussion of excessive technical detail often leads to derailment of the case presentation and therefore causes patients to think the process is too involved or complicated for them.

Michael Corsello
Education! If you do not know what implant systems to even consider then you have a great learning opportunity. I would advise a maxi-course such as offered by **Implant Seminars** (Dr Garg) or **Misch Institute**. Simply conferring with an Oral Surgeon/ Periodontist is a good starting point but as you can imagine there is a lot to consider. First there are the two major considerations, surgical and prosthetic. You really need to understand both to even begin to consider what primary system you will be using. A doctor who has been trained and has experience in both disciplines is really your best source of informal information. A formal training program will enlighten you on the implications in bone physiology, soft tissue, prosthetics, systemic conditions, implant coatings, thread design etc... This enables you to understand the factors which will influence implant selection. For example what implant are you going to use in a grafted site or poor bone quality? When do you need to submerge and when do you want a single phase design? Furthermore there will not be one company which you will want to use for every case, at least not at this time.

Ian Braby
I would agree with you that, by and large, most systems available today are pretty equal. But that is not the case with an individual's experience and, on that basis, I would suggest that those embarking on their implant careers should use one of the more popular systems as the companies offer a wealth of support when starting out. Once established, you can begin to consider substituting your implant system of choice with a clone system - the same implant at a cheaper cost - as you should no longer require the level of support that the major companies can offer. I offer this as someone who was 15 years with a major company and now works with a clone company.

Andrew Wood
As a dental technician who has worked with various different implant systems for some twenty plus years now, I find that good communication and discussion with your technician is also very important. Many of the limitations with various implant systems are not always obvious from the technical info given in brochures and advertising material, whereas finding out from your technician the benefits and disadvantages of particular implant systems in specific cases with regard to the function as well as cosmetic result, may help you in your final diagnosis.

Paul Farrell
I will preface my comments by disclosing that I am and Opinion Leader and a member of the international Connecting Science Circle for Thommen Medical (see my profile). As a surgeon I have, over the past 25 years, made my way through multiple implant systems. As I have taken an interest in being the best that I can be with my role within the Team approach to working with dental implants, I have changed systems periodically make the treatment process as simple, reliable, comfortable, and as cost efficient as possible for all concerned. This is difficult to achieve in the current "climate' of implant dentistry as 95% of the discussion at major meetings is focused on less than 5% of the patients that are treated routinely with implants. This happens at a level that is of little value to many of the practitioners that have less experience and are trying to learn how to plan and work more effectively with implants in daily practice. The system that I use addresses as many of these issues as possible for restorative dentists with all levels of experience and ability where implant case planning and use in private practice are concerned.

Danny Hiller
4 years Dental School 7 years implant sales - In my experience most of the implants today osseointegrate well enough. Most of the failures I've seen are due to something other than the implant itself. And, that's where the evaluation really needs to take place. Fundamentally, those who place implants are not equal in their abilities. Also, a system may work better for one practitioner, but not for another - for whatever reason, whether it be training, psychological, or design. Also, when I mention failure, I don't just mean a lost implant or excessive loss of bone. I'm also including esthetic, phonetic, and functional failure. So that being said, I think there are a few underlying principles that will increase the likelihood of success for your overall implant practice, rather than just looking at an implant: 1) Get educated - There are some great courses out there. Though, if you're just getting started it will cost around $100,000 to get fully trained (restorative & surgical). You're going to need bone and tissue grafting courses, ridge augmentation, and sinus lift courses (in the beginning - probably not going to do these kind of cases, but you'll eventually move to these cases). Most overlooked, are the emergency courses - you're going to need to know what to do, just in case. Unlike what most people think, implant surgery can go real south in a real hurry (I've seen it). 2) Fully understand that

most of your cases will probably be a team effort between the surgeon, the restorative doc, and the lab - sometimes the rep, if they're any good. I've seen implants placed in the embrasures, I've seen multiple implants placed where one would have sufficed. The implant always integrates when it's in the wrong place. It all becomes a restorative nightmare, leading to a potential treatment failure. So, it's incumbent upon the surgeon that he know restorative, and vice versa. And, if you are doing the surgery and the restorative, then you need to know the concepts of both. 3) Understand the system you choose. A surgeon typically just learns the surgical side of the system, and the restorative doc, rarely knows the system and leaves himself at the mercy of the surgeon and the rep. The Docs I like to work with the most, do both. Because they do both, they have to understand the system they use and its limitations. I also think it behooves implantologists to learn the new technologies such as what 3M and Atlantis have to offer, because it might increase efficiencies = profit. 4) Make sure that your practice is set up to handle implant dentistry. I've walked into offices that want to start implant dentistry but don't have digital radiography. Also, your assistants, hygienists, and front office have to be on board or you may end up losing a lot of money. Implantology is a subspecialty, I would treat my supply room as such and keep implant supplies separate. 5) Understand your limitations...toughest thing for a doctor to say is "I'm not very good at this, I should probably leave it to someone else". I know when I was in school, I had a knack for endo. I was terrible at removable. It's hard to find a dentist who is truly outstanding at everything. I'm just saying, you can save yourself a lot of stress by knowing when to refer. So, the original question was - What implant system, and how do you determine...I say, whatever works in your hands and makes sense for your practice (I have a preference, yes). Are there nuances...yes - and I do know what they are. Unlike most reps, I like to read research articles. Maybe if anyone's interested I'll elaborate on what I see in the industry.

Nedim Sulejmanagiæ
Totaly agree that most implant systems are same. All of them are made of at least grade 2 titanium, which is enough to withstand biting and other forces in mouth. I would suggest to choose internal connection when placing single implants to avoid rotational forces on the screw itself. Otherwise for us doctors, patients bone quality is most important

Dan Pfluger
As the restorative lab we like a system that keeps bone loss near zero. All three of the following are a good bet. I like Ankylos for the Morse taper concept but wish you could do custom abutments. Zirconia abutments are a little pricey. Good support. Nobel Biocare has a good system and support, we like the custom abutment selection and product line. Straumann has very good support. They incorporated the Morse taper and internal hex very well. Custom abutments and restorative options are many. We see many other systems, but the support is very spotty.

Jon Bergstresser
The ability to hold the bone height is, in my opinion the most important aspect of an implant. If the bone height drops down around the implant, the tissue will recede to reflect the new, (usually lower) bone height. There is a lot of research on which implants have the best bone retention. The interface connection really matters by the way, minimizing micro movement at the implant /abutment interface is important. From a technician standpoint I want to be able to rely on the soft tissues to be stable to have a healthy "pink" as well as a natural tooth display.

Andreas Danielsson
Many implants today do have great designs, surfaces, user-friendliness etc. Use the Osstell ISQ - the only objective, scientific way to measure implant stability, to quality assure your treatment (**www.osstell.com**).

Lars Hansson
I see that a lot of you use Ankylos, and we know that that system has been only stock abutments for many years and has limited the use sometimes. But now we can actually offer Cad Cam abutments in both Zirconium and Titanium for Ankylos. That I think will make Ankylos even a more interesting implant to choose. The prosthetics are a must and the preservation of bone.

Jeff Yeider
My experience with oral implants started in 1974, with Dentists hammering in blade implants cast from non precious alloys. I found Branemark had started the implant revolution. I have worked with every system from

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Astra to Zimmer , advocated, tested, and lectured for some in between, as I helped in the development of the first all ceramic pressing systems, as well as developing the first USA version of milled Zirconia while advocating for the world's largest dental supplier. I know what I'm talking about when it comes to dentistry. So here is my advice on how to choose a system, it's not the system, It's the technical ability of the implantologist, and your restorative lab's ability. Find a good colleague, and a good lab.

Janet Rice, DDS
I have been placing implants for 20+ years and worked with most the implant companies. I currently only place NobelBiocare. I could buy cheaper but quality assurance is so important. And a company that you know will be there in the future. I have seen companies come and go. Branemark is a name that started it all and I have been placing them exclusively for over10 yrs. with great results. Chose a company with a commitment. Like Branemark's NobelBiocare.

Marino Vilbi
I have been using compatible and original dental implants systems for many years. Different studies prove that most of compatibles are of the same quality of the originals giving the same long term result. Big companies have to justify the expensive price with the so called "support". How many experienced professionals (implantologists or technicians) do actually call a company support to solve out a complication? Personally I chose the company by the following criteria: 1) Good quality and reliability of the implants 2) Compatibility with major brands 3) Guarantee of the devices - I also do not under estimate the following points: 1) Company dealer able to waste minimum of my time to refill the stock and (even better) 2) Possibility to make orders on the net at any time of the day at any day of the week. 3) Yearly statistic of my purchases. 4) Online invoice 5) Same price for every professional.

Dr. Armen Hartoonian DMD, CAGS
Any implant should be placed where prosthesis will be,therefore, occlusion is one the most important factor for implant success. There are many factors for any implant system to be successful. Prosthesis to have narrow occlusal plane (baccalo-lingualy) the less lateral forces during chewing, therefore, better results. Also other most important thing about the implant system is the top part design where prosthesis placed (longer internal the better result), Nobel Biocare design is one of the best, but there are other good systems.