Introducing
Research radar
Your guide to the latest literature

When and how to use d-PTFE membranes: part II

Congress toolkit:
Vienna 2018

Everything you need to know about the EAO Consensus Conference

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Volume 6, Issue 1 / Summer 2018
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Welcome to the latest issue of *Inspyred*. As ever, this magazine provides an ‘alternative voice’ to traditional peer-reviewed journals. We are proud to present the ‘real’ clinical cases, and offer our readers practical, on-the-ground information which can help them in their daily practice. We have filled our summer 2018 issue with exciting news about the association to keep you up-to-date about all things EAO, as well as interesting and innovative clinical cases from across Europe.

Since its launch, printed copies of *Inspyred* have contained abridged versions of articles and selections of figures, while the full versions of each article were made available online for members. But for the first time ever, and to make it even easier for you to get the most out of *Inspyred*, we are printing each article in full in this issue. You can now read all content, completely unabridged, right here in the printed copy.

And that’s not all that’s new: this summer, we are pleased to unveil our all-new ‘Research radar’ column. This column gathers some of the most interesting articles published in the biggest European journals and includes teaser information about each one. The articles have been hand-picked by the *Inspyred* Editorial Committee to give you the low-down on what to look out for in the current literature. Find the ‘Research radar’ on page 12, and find out what research should be on your radar!

Make sure you also check out the clinical articles in this issue. On page 8, Melle Vroom and LJMM Gründemann have written a follow-up to their memorable article on ridge preservation/restoration using d-PTFE membranes in the summer 2016 issue of *Inspyred*.

Also not to be missed in this issue is Mathieu Deudon’s article on page 16. Find it on page 16 to hear about an interesting perspective on dental prophylaxy and dental hygiene.

On page 22 you’ll find Teppei Tsukiyama’s article which looks at vertical and horizontal ridge deficiencies. This challenging case involved multiple adjacent missing teeth in the aesthetic zone.

We are also delighted to include an exclusive interview with Dr Sven Mühlemann, who is a member of the EAO Junior Committee and a rapporteur at the 2018 EAO Consensus Conference. We asked Dr Mühlemann about what is involved in the EAO Consensus Conference, and how he prepared for this prestigious event. Read his answers and insights on page 5.

This issue also includes behind-the-scenes information about how to get the most out this year’s annual scientific meeting which takes place in Vienna in October. Get the inside scoop on how to make the most of your congress experience on page 19.

As ever, we look forward to hearing your feedback and suggestions for this and future editions. Please do not hesitate to get in touch by emailing us at inspyred@eao.org.

Isabella Rocchietta and David Nisand

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Since 2006, the EAO has held a Consensus Conference every three years. These conferences bring together around 50 specialists in the field of implant dentistry to review and discuss topics which are often the subject of clinical controversy or emerging practice.

The conference is an opportunity for some of the best minds in the field of implant dentistry to identify the scientific basis for best practice and provide guidance on key topics for the dental community. And the EAO Consensus Conference is unique: it is financed entirely by the EAO so that it remains free from commercial influence and completely independent from industry.

The conference usually covers four main themes which are discussed among dedicated working groups. Each group is comprised of a chair, secretary, rapporteurs and regular members. During the conference, the working groups can come together at twice-daily plenary sessions to present their preliminary conclusions and make suggestions. By the end of the conference, each group is expected to have agreed a draft consensus report which will subsequently be published in Clinical Oral Implants Research as an open-access supplement.

This year’s Consensus Conference was held in Pfäffikon, Switzerland from 7–10 February. The titles of the four working groups were follows:

- Group 1: Drugs and diseases
- Group 2: Biological parameters, registry
- Group 3: Reconstructions
- Group 4: Biomechanical aspects

Results and findings from each of the working groups will be published with open access in Clinical Oral Implants Research later this year, which will also be distributed to delegates during the EAO’s annual meeting in Vienna in October.
At the EAO Consensus Conference, Inspyred caught up with Sven Mühlemann, a rapporteur for the ‘Reconstructions’ working group. We asked him what is involved in being a rapporteur and what makes the EAO Consensus Conference special.

What does being a rapporteur for a Consensus Conference involve?

In each working group, there are several rapporteurs who are assigned specific topics to research. Before the conference, the rapporteurs prepare a narrative or systematic review of their topic; this is then circulated to the rest of their working group to review in advance of the event.

Once the Consensus Conference has started, these papers form the foundation of the working group discussions. Other participants give feedback on the papers and discuss each topic in much more depth. At this point, the working groups start formulating their consensus statements and recommendations for future research. These findings are then presented to the full cohort of conference participants during the plenary sessions, and a consensus can be made. That’s how the conference works on the whole, and the rapporteurs act as a conduit between the primary research and the rest of the working group.

How long did it take you to prepare your paper?

About six months, and the process was intensive. It’s the rapporteur’s job to search the complete literature available on their assigned topic, and undergo a lengthy selection process to determine whether papers meet the inclusion criteria. This cannot be done by just one person. I collaborated with some colleagues at the University of Zurich: Riccardo Kraus, Christoph Hämerle, and Daniel Thoma.

We started with over 5,000 manuscripts, reading the abstract of each and deciding whether they met the inclusion criteria. We then read the full text of the papers which had passed this initial screening, and had to ask again if they could be included based on the inclusion criteria.

This took several months, and we ended up with 11 papers. Afterwards, we began extracting the data. And even then we knew there was still plenty of work to do: our paper would be thoroughly reviewed and discussed at the Consensus Conference with the working group. So in fact it’s still a work in progress.

Did your approach for preparing the review differ from how you would normally write a paper?

Because of the nature of the paper, the literature review was much more extensive and it took longer to write. Initially, rapporteurs are selected because they already have a good deal of experience in a particular topic. But to write the review, they must quickly become experts in it.

The review process is where the approach diverged. When you submit a paper to a journal, it goes through a peer-review process, and it is assessed by two reviewers. When you are preparing a paper for the Consensus Conference, it is being submitted to a working group of around a dozen people who will be analysing it.

At the Consensus Conference, what you get is a kind of accelerated review process. The working groups have two weeks to review your paper before the event, and then it is discussed during the working sessions on-site. And after that, the paper is presented to all the conference participants at the plenary sessions, so there is an additional layer of review.
And at this point, all the information from the manuscript is condensed. The group’s major findings and clinical recommendations are also added, as well as recommendations for future research where a lack of data has been identified.

**Do you think your paper has been subject to more or less scrutiny than it would have been if it were submitted to a journal?**

Yes – as part of the normal peer-review process, you receive feedback by email. But here, your reviewers are the working group and they are discussing the paper with you, face-to-face. You’re getting real-time feedback on your work, so you can explain in person if anything is unclear, and then you work together to improve the findings to communicate them in a way that is understandable. This makes the process much easier, as it is face-to-face and there are more people involved. It’s much more collaborative.

**What is your main area of expertise, and how does this relate to the topic which you were assigned?**

I specialise in prosthodontics, and my current area of research is reconstructions on implants and teeth. At the Consensus Conference, I was a member of the Reconstructions working group, and my specific topic was CAD/CAM and digital technologies. This topic is especially important because digital advances are relevant to every topic and research field, and as technology progresses further, it becomes increasingly ubiquitous.

More specifically, my paper reviewed CAD/CAM fabrication techniques and evaluated their time and cost efficiency compared with traditional methods. Of course, the paper also looked at how effective these techniques are, because it doesn’t matter whether a technique is quicker and cheaper if the results are not as good.

The rapporteurs act as a conduit between the primary research and the rest of the working group.

I currently split my time between researching, teaching and working with patients. And it’s interesting, because in a university or research setting, many digital technologies are available. However, researchers should keep in mind that most private practices do not have the same resources available to them as institutions with bigger budgets. And the rate of development is so quick, that equipment can become obsolete in just a few years and needs to be replaced. High running costs and fast development rates are a limiting factor for many.

And it’s not just the financial burden that is an issue. It’s common for first-generation products to have ‘bugs’. This is taken for granted with phones and the like, but if there is a bug or fault in a piece of dental equipment, the consequences could be catastrophic. The stakes are much higher. So with dental technology, it’s even more important that equipment is tested thoroughly and we can be completely certain everything works.

Even if you can afford to upgrade your equipment as technology advances, having to continually change and recalibrate your workflow would be hugely disruptive. Just as you are getting used to something, you would have to change it again. Your workflow (whether it is conventional, digital or a mixture of the two) is a finely tuned instrument, and altering one aspect can throw the rest of the process off balance.

**The conference findings will give clinicians a condensed overview of the literature.**
So although there are great advances being made, there are associated drawbacks. That is what my paper is assessing: how effective these advances are, and whether they are efficient.

**How do you think the findings from the Consensus Conference will affect the clinical community?**

The conference findings will give clinicians a condensed overview of the literature along with a very high quality evidence-based appraisal of it. They distil down everything that has been discussed at the conference. They will contain our consensus statements and clinical recommendations, providing a valuable resource for clinicians who do not have the time to read all of the papers themselves.

In practical terms, the findings will help clinicians choose which method or treatment plan to use, and give them the evidence they need to make this decision. That’s the service we are providing. The literature has been completely screened for clinicians, and the topics have been thoroughly discussed, dissected and debated by a group of experts.

**When will the Consensus Conference findings be published?**

A special supplement will be published in *Clinical Oral Implants Research (COIR)* later this year. The findings will be available online and in COIR, but I think where the knowledge will be most effectively transferred will be at the EAO’s 2018 annual scientific meeting in Vienna.

This is where our findings will really be brought to life and circulated to clinicians. There will be thousands of attendees, and the knowledge from this event will be communicated in papers and presentations by the chairmen. You’ll have a meeting where people can come together and exchange ideas, and you can give them scientific information directly.

Often, clinicians don’t have time to read journals and stay up-to-date with the current literature. But the scientific meeting is a great opportunity to gain a real breadth of knowledge condensed into a few days, and so the CC results are perfectly formatted for this. And this is what it’s all about: disseminating knowledge that is reliable and evidence-based.
Ridge preservation/restoration using d-PTFE membranes

Part II: A protocol for using non-resorbable membranes immediately after extraction of teeth with advanced bone loss

The use of non-resorbable d-PTFE membranes in ridge preservation was first described by Bartee in 2001. Although this technique was presented around 17 years ago, it has not, in our opinion, received the attention it deserves. In the summer 2016 issue of Inspyred, we described a protocol for using these kinds of non-resorbable membranes immediately after extraction. This follow-up article describes an additional application/indication for d-PTFE membranes: immediately after tooth extraction in cases involving advanced bone loss.

In our 2016 article, we outlined the reasons why d-PTFE membranes are required for this technique: they are non-permeable to bacteria, and as a result retain their functionality when they are exposed to the oral cavity. This was recently demonstrated in a study in which histological data showed that directly after membrane removal no endothelial cells or bacterial contamination was present (Laurito et al. 2016). Four to five months after membrane removal, histological data showed the formation of mainly newly formed bone (Hoffmann et al. 2008). Another advantage associated with d-PTFE membranes is the increased width of keratinised tissue which can be gained during the healing process (Barboza et al. 2014).

The original technique described in 2001 was called ‘extraction site reconstruction for alveolar ridge preservation, membrane-assisted surgical technique’, and it included the use non-titanium-reinforced d-PTFE membranes. In our practice, however, we have been applying titanium-reinforced d-PTFE membranes (Cytoplast, Osteogenics Biomedical) immediately after tooth extractions where there has been advanced bone loss. The results from this approach have consistently been fascinating.

By using titanium-reinforced membranes in cases involving advanced bone loss, we have been able to expand the indications of Bartee’s original technique. In retrospect, it may be more suitable to describe the technique as ‘immediate augmentation and ridge preservation following extraction including increasing the amount of keratinised tissue’. The following two cases illustrate the potential benefits of this technique when used with titanium-reinforced d-PTFE membranes.

Case 1

The patient’s tooth 16 had to be extracted due to: deep caries; widened periodontal ligament space; partial endodontic root treatment; a class II furcation involvement on the buccal and mesial aspect; and a 4mm buccal recession (Figure 1). According to our assessment, if tooth 16 was extracted using conventional means, a sinus lift would later be required before an implant could be placed.

We decided to perform immediate augmentation and ridge preservation after extraction and use a titanium-reinforced d-PTFE membrane (as tooth 16 showed advanced bone loss). The reinforced membrane would provide the necessary stability for guided bone regeneration (GBR) in the area.

Figure 1
Figure 2
Figure 3
Figure 4
Figure 5

Figure 1. X-ray image of tooth 16.
Figure 2. Clinical picture four weeks after extraction and membrane placement.
Figure 3. The membrane after removal.
Figure 4. Clinical picture directly after membrane removal. Note that resorbable sutures haven been applied to stabilise the wound edges.
Figure 5. The same area three months after membrane removal. Note the widened zone of keratinised tissue.
Tooth 16 was extracted with as little trauma as possible; the alveolus was carefully cleaned and all granulation was removed. A small buccal flap was elevated with a vertical incision in the region of tooth 17. This provided better access, as the area was also going to be augmented. Because the membrane was being placed between the existing bone walls and tissue, we prepared an ‘envelope’ around the alveolus using a small elevator or papilla-lifting instrument. The alveolus, and a part of the area around 17, was filled with an allogeneic bone graft material which could be mixed with a xenograft. The GBR area was then covered with a titanium-reinforced d-PTFE membrane which had been trimmed to the desired size.

During placement, care was taken that the membrane be bent in the desired shape (as this dictates where the bone will regenerate). We returned the buccal flap to its original location and sutured the tissues. Our main goal here was to stabilise the tissues and membrane. The wound margins were sutured using a combination of horizontal mattress sutures, single and cross sutures. We made sure that the edges of the membrane were not in contact with the neighbouring tooth and that they were covered with soft tissue. Post-operative instructions included no mechanical cleaning of the area and rinsing twice a day with chlorhexidine.

At this point, it is important to stress that the tissues should not be closed primarily, and a horizontal releasing incision should not be made in the buccal flap. The reason for this is that the mucogingival junction should be left in its original position.

After one month we removed the membrane and found that tissue healing had been uneventful (Figures 2–4). Since a part of the area around tooth 17 had also been restored, a larger membrane (20 x 25mm) was used (Figure 3). Following membrane removal, the newly-formed osteoid matrix was clearly visible and resorbable sutures were applied to stabilise the wound edges (Figure 4). There was no need to cover the newly-formed osteoid matrix as the matrix follows the normal healing pattern.

Three months later, the clinical pictures showed a widened zone of keratinised tissue and alveolar ridge preservation/restoration (Figure 5). The implant was placed and when the implant bed was being prepared, hard regenerated bone was noticed. The sharp edges of the marginal bone after implant bed preparation illustrate the hardness of the regenerated bone (Figures 6 and 7). An 8mm implant was placed without perforating the sinus; three months later the crown was placed (Figure 8). An x-ray taken after crown placement shows a stable and more favourable bone situation than the initial situation (compare Figures 1 and 9). The clinical picture taken two years after crown placement shows a stable situation (Figure 10).
Case 2

The second clinical case involves two molars which had to be extracted because of advanced periodontal attachment loss combined with a fistula at 17 and caries at 16 (Figures 11–13). A flap was elevated, after which both molars were extracted in a minimally traumatic way. The alveoli were carefully cleaned and all granulation was removed (Figure 14). Due to the extent of bone destruction and size of the defects, a large titanium-reinforced d-PTFE membrane (25 x 30mm) was selected and trimmed with scissors (Figure 15). The membrane was bent with surgical tweezers into the desired shape.

The 2.5 cc allogeneic bone graft material was placed in the alveoli to act as filler material and covered with the membrane. Next, stabilising sutures were used (Figures 16–18). The wound margins were sutured using a combination of horizontal mattress sutures, single and cross sutures. Again, it must be emphasised we deliberately did not primarily close the wound edges. Although the protocol for conventional extraction involves closing wound margins if possible, primary closure is unsuitable for this technique (Figure 18).

After four to five weeks the tissue healing was uneventful (Figure 19). The membrane was removed, after which the newly formed osteoid matrix was visible (Figure 20). From the initial clinical view, it can be difficult to envisage the final result. However, we know from one study (Hoffmann et al. 2008) that epithelialisation is usually complete after four weeks and the formed osteoid matrix will change into alveolar bone over time.

Five months after extraction and placement of the membrane, a wide zone of keratinised tissue was visible (Figure 21). The CBCT image demonstrated the level of ridge preservation and restoration which had been achieved (compare Figures 11 and 22–23). At the time of implant placement, a somewhat irregular bone surface was visible as the allogeneic graft material consisted entirely of cortical bone parts (Figure 24). The tissues were thickened with a connective tissue graft taken from the tuberosity to achieve the required peri-implant tissue thickness (Figure 25). After a healing period was observed, the crowns were placed (Figures 26 and 27). The x-ray taken at that time clearly showed the ridge preservation, but also highlighted the degree of ridge restoration which had been achieved, especially when compared with the x-ray taken before extraction of both molars (compare Figures 11 and 27).

Conclusion

Using a titanium-reinforced d-PTFE membrane immediately after extraction of teeth with advanced bone loss is a valuable technique with promising results which have been clinically demonstrated. When incorporated into a suitable treatment plan, the technique can make implant placement easier and more predictable. It also considerably increases the likelihood that no additional bone augmentation procedures will be required (including sinus lifts) at the time of implant placement.

d-PTFE membranes can preserve the shape of the alveolar ridge and increase the amount of keratinised gingiva. Moreover, they are capable of restoring severely damaged ridges to a high degree, even in compromised situations. However, the use of this technique in acutely infected sites is not recommended.
Figures 16–18. Clinical picture at time of membrane placement and after suturing.


Figure 21. Four months after membrane removal the tissues have healed nicely and a widened zone of keratinised tissue is visible.

Figures 22–23. CBCT image of the area, five months after membrane placement, showing the amount of bone gain when compared to Figure 11.

Figures 24–25. Clinical picture after implant placement. A connective tissue graft is used to thicken the tissue around the future abutments.

Figure 26. Clinical view after crowns placement.

Figure 27. X-ray after crowns placement. Compare with Figure 11 to note the bone gain.

References


Welcome to the newest feature of Inspyred: Our editorial committee have been scouring the leading journals in implant dentistry, and have hand-picked their favourite articles to share with you. You'll find a selection of the most interesting and cutting-edge research papers in the current literature. Get the low-down on the latest research, and read our tips for which articles to look out for.

This meta-analysis assessed the clinical performance of Nobel Biocare's TiUnite implant surface. It put 106 publications which met the inclusion criteria (out of 32,519) under the microscope, and found high survival rates for all implant designs associated with TiUnite, as well as promising marginal bone levels.

Nevertheless, the authors interpreted their findings cautiously. Because the analysis focused on implant surface, all conventional implant types in the TiUnite portfolio were included. Consequently, several selection criteria used in prospective clinical trials (differences in implant geometry, thread design, implant abutment connection, and cervical texture) were found to be problematic. This is because clinicians generally do not use the entire implant portfolio in a single study; nevertheless, this best reflects daily clinical practice.

What's also interesting about this article is that peri-implantitis was only scored when reported during primary research (despite the fact that they used different parameters). Furthermore, although most of the qualifying papers defined peri-implantitis as increased probing depth or bleeding on probing, these diagnostic criteria have themselves been questioned. The paper reported similar rates of peri-implantitis with TiUnite implants as those reported for sand-blasted, large-grit and acid-etched implant surfaces. In a retrospective analysis, the prevalence of peri-implantitis was 1.8% in a cohort of 303 orally healthy patients (511 implants).

This in-depth study holds up under scrutiny, and represents the highest level of evidence available in science.

The International Journal of Oral & Maxillofacial Implants

REVIEWED BY: Victor Palarie

ARTICLE CITATION:

Clinical performance of dental implants with a moderately rough (TiUnite) surface: a meta-analysis of prospective clinical studies

Karl M, Albrektsson T.
You’ve heard it before: patient-related outcome measures (PROMs) and experience measures (PREMs) are key for assessing clinical outcomes and improving patient care. But how do you find good quality evidence which also covers PROMs?

The good news is that when it comes to digital versus conventional impressions, Gallardo et al. have done most of the hard work. For their systematic review, the authors conducted a search of five electronic databases, identifying a total of 2,943 papers published between 1955 and 2016. Of these, five met the inclusion criteria.

One paper reported no difference between digital and conventional impression techniques in terms of patient comfort. The other four found that the digital technique was more comfortable and caused less anxiety and nausea for patients. However, when it came to procedure times, it was less clear-cut: two studies found that the conventional method was quicker, while the other three reported that the digital technique took less time.

The authors concluded that patients tend to prefer digital over conventional techniques. So if you are looking to improve your patients’ experiences and considering moving to a digital workflow, this could be the paper which persuades you to take that leap!

In general, implant therapy is a very predictable treatment modality. High success rates can be achieved as long as strict treatment protocols and patient-selection criteria are observed. In reality, however, technical and biological complications can still occur. And in fact, many research groups have reported dramatically high complication rates. Of these, implant fracture is undoubtedly the most catastrophic. It requires complex procedures to treat and is associated with higher patient morbidity.

A research group led by Chrcanovic et al. assessed the prevalence of implant fracture together with associated risk factors. They collected data from 2,760 patients and a total of 10,099 dental implants, and reviewed the performance of implants placed over a period of 34 years. They found that 44 of the 10,099 implants fractured, with five main factors that had a statistically significant influence on implant fracture. These were: grades of titanium, bruxism, position of the dental implant in relation to a cantilever of the prosthetic superstructure and changes in implant length and width dimensions.

The magnitude of the study provides an invaluable overview of the evidence. The article offers clear and transparent information about the risk factors associated with implant fracture. Studies like this provide clinicians with a touchstone for minimising and potentially even eliminating risk factors in their daily practice.
Clay nanoparticles for regenerative medicine and biomaterial design: A review of clay bioactivity

Mousa M, Evans ND, Orefoo ROC, Dawson JI.

Biomaterials

REVIEWED BY: Martin Brient


Clay is cool. It’s one of nature’s best kept secrets, and some kinds are used for their nutritional properties. In Peru, parrots eat clay to get sodium which their young require; in Uganda, chimps eat clay to boost their mineral intake. And guess what: our patients could also benefit from clay (although you don’t have to prescribe geophagy, which is the practice of eating soil).

In addition to the established uses of clay as a drug delivery modifier or mechanical property enhancer, certain kinds of clay have been shown to be useful as bioactive additives. These clays can enhance cellular functions like adhesion, proliferation and differentiation, and most notably, osteogenesis. Even though the mechanism remains poorly understood, it could be of great interest to improve our bone regeneration procedures.

Check out this enlightening article to find out what exciting uses clay could have in store for your practice!

A multifaceted coating on titanium dictates osteoimmunomodulation and osteo/angio-genesis towards ameliorative osseointegration


Biomaterials

REVIEWED BY: Martin Brient


And there’s also good news for those of you who prefer to prescribe titanium. The battle for the best titanium-based implant surface continues. Stepping up to the plate: a Sino-Australian team who have evaluated the in vitro and in vivo effects of heat-based annealing after construction of a microporous titanium dioxide coating on titanium implant surfaces.

The battle for the best titanium-based implant surface continues.

In vitro experiments revealed that the MAO-650 coating enabled favourable osteoimmunomodulation and inhibited the inflammatory response of macrophages. The in vivo evaluation showed that MAO-650 improved osseointegration compared to the MAO coating without annealing.

So, I’m guessing that the question on everybody’s lips is: how long before we can assess the effect of a clay nanoparticle coating annealed on titanium implant surfaces?

Well, you can count on us to not keep it secret…
If you want to get a better understanding of bone volume, you have to look deeper. This article does just that. The authors of the study assessed the effect of particle size and type by comparing different bone substitute materials (biphasic β-tricalcium phosphate with hydroxyapatite (alloplast) versus allograft) used in ridge split procedures. In the two treatment groups, different particle sizes were used: small (0.25–1mm) and large (1–2mm).

So what’s the big deal with big particle sizes?

And the results are in: the study found that alloplastic materials achieved better levels of ridge width gain. On average, large alloplastic particles had a mean ridge width gain of 4.40 ± 0.24mm; small alloplastic particles had 3.52 ± 0.39mm. Large allograft particles: 3.82 ± 0.19mm; small allograft particles: 2.57 ± 0.16mm. What is even more interesting is that large particle sizes consistently achieved significantly higher ridge width at the time of implant placement.

So what’s the big deal with big particle sizes? For clinicians, the choice is clear: larger particles seem to get better outcomes. They offer more ridge width gain, which in turn can lead to better results.

This RCT investigated whether minimally rough (Sa 0.20 ± 0.02) implant surfaces could achieve better outcomes than moderately rough (Sa 1.44 ± 0.02) surfaces in patients with a history of severe periodontitis.

In a prospective randomised controlled clinical trial, 48 minimally (Tur) and moderately (TiU) rough implants were placed in 18 patients using a split-mouth protocol. There were two sub-groups: one group (n = 10) of patients had had all their teeth extracted due to severe periodontitis and the second (n = 8) had teeth in the antagonistic jaw with a history of periodontitis.

The authors found that partially edentulous patients with a history of severe periodontitis were at higher risk of developing peri-implantitis. In partially edentulous patients, moderately rough surfaces showed more bone loss than Tur surfaces. The minimally rough surfaces in these patients had lower survival rates due to early failures, but otherwise showed more favourable clinical results. On a microbiological level, moderately rough surfaces showed more pathogenic microbiota, but this was not statistically significant.

So how rough is too rough?

So how rough is too rough? The authors concluded that for patients with a history of severe periodontitis, minimally rough implants had more favourable clinical parameters after 5 years of loading compared to moderately rough implants.

Stay tuned for the next issue of Inspyred, when the Editorial Committee will bring you an all-new selection of top articles from high-impact journals!
A new method for professional prevention is emerging in various disciplines. It is innovative prophylaxy, and it is faster, cheaper, and less aggressive than traditional methods. The protocol is based on the chronological inversion of different stages of therapy.

Guided biofilm therapy is a prophylactic treatment approach for enabling biofilm management. It provides a two-stage clinical protocol which can ensure the complete cleaning of teeth while preserving tooth substance.

The previous protocol for removing hard and soft deposits, which begins with hand instruments, continues with an ultrasonic device and ends with classic polishing methods (rubber cups, brushing, polishing pastes), is today still widely used in dentistry. However, recent clinical studies show that this method is not optimal. It can leave distinct marks on the hard tooth structure and is overly aggressive on soft tissue.

The procedure for guided biofilm prophylaxis focuses not only on the removal of hard and soft deposits, but can also operate as part of/be integrated in different treatment sequences. The procedure can guarantee complete cleaning, even in the most difficult-to-reach areas and at the same time preserves tooth substance and natural tissue. Several studies (Botti et al. 2010; Bastendorf et al. 2016; Chetrous et al. 2013) have reported more efficient results following professional prophylaxis used with a disclosing agent. It has also been shown that the need for additional tools and materials like polishing paste can be avoided (Patil et al. 2015; Flemmig et al. 2007; Botti et al. 2010), and better results have been reported using air polishing techniques than rubber cups and polishing pastes.

**The procedure**

For optimal results, it is first necessary to make a diagnosis of the soft tissue and mucosal membranes to raise patient awareness of the benefits of good oral hygiene and motivate them.

This is even more important because prophylaxy starts at home. To be effective, professional prophylaxis must be complemented by prophylactic measures taken by the patient themselves. The first and most common technique for preparing the tooth surface is the easiest: brushing your teeth. This disrupts the formation of biofilms usually present on teeth. Professional tooth cleaning then ensures the removal of biofilm from areas that are difficult for patients to reach. It has been illustrated in several studies (Wennstrom et al. 2011; Ronay et al. 2017; Buhler et al. 2015; Barnes et al. 2015; Aslund et al. 2008) that air polishing is not only minimally invasive, but is also safe to be performed on soft tissues, implants and restorations.

**Advantages of the new technique**

Guided biofilm therapy can guarantee efficient cleaning and the complete removal of biofilm even in hard-to-reach areas, while preserving the tooth structure and natural tissue. The need for polishing paste during the final polishing procedure can therefore be avoided. Furthermore, patients really appreciate this gentle and painless form of treatment, and in our experience are even happy to come to prophylaxis sessions. This has been found to be the case in a number of studies (Hägi et al. 2015; Buhler et al. 2014), which found that air polishing is extremely comfortable and has a high patient compliance associated with it.

Implant and prosthetic treatment is a global process in the office. The patient’s feelings and satisfaction are therefore even more critically important. Effective prophylaxy and recall is one way to maintain their connection to your practice, and establishing regular appointments is a win-win for patients and clinicians alike. For patients, it provides long-lasting health improvements; for clinicians, a successful recall operation increases treatment effectiveness, which of course means a booming practice and increased profitability. Patient...
recall depends on a number of factors, such as: pain perception, fear, anxiety, noise, vibration (De Jongh & Stouthard 1993). For patients to want to return to your practice, they have to feel comfortable there.

References


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DAY 2: Surgical treatment
DAY 3: Prosthetics and follow-up.

LIVE SURGERY SESSIONS
Three live surgery sessions for the first time at the EAO Congress.

CADAVER COURSES AND HANDS-ON SESSIONS
Training under the guidance of renowned experts.

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This October, the EAO’s annual congress will be coming to Vienna, Austria. This year will mark the association’s 27th annual scientific meeting, and already looks like it will be the EAO’s most ambitious and interactive meeting yet.

The theme of the 2018 congress is ‘Dreams and reality in implant dentistry.’ This year, the goal of the scientific programme is to explore the boundaries between what is clinically possible, emerging techniques, and patient expectations.

And for the first time ever, the congress will feature live surgery sessions. This will add an important and dynamic extra dimension to the innovations which have been introduced to the scientific programme in recent years. The live surgery sessions will be broadcast from three world-renowned Austrian medical centres: Vienna Dental School, Academy of Oral Implantology and Graz Dental School.

Each of the three days of the meeting will focus on a specific theme, supported by a live surgery session which will be broadcast directly into the main auditorium. The themes for each day are as follows:

- **Day 1:** Diagnostics
- **Day 2:** Surgical treatment
- **Day 3:** Prosthetics and follow-up

The scientific programme has been specifically engineered to mirror the treatment process. The congress will begin as most treatment protocols begin: with diagnosis. Day 2 will continue from there and focus on treatment and surgery itself, while Day 3 will cover the prosthetic stage of treatment and follow-up.

As ever, presentations will be given by a prestigious faculty of speakers and supported by some of the most important emerging figures in the field. The programme will include more interactive elements than ever before, building on the success of new features introduced during the meetings in Paris in 2016 and Madrid in 2017.

The congress will provide a unique platform for sharing the latest scientific expertise in a balanced forum completely free from commercial influence. It will also provide the ideal setting to meet old friends, make new connections, and explore one of the industry’s biggest trade shows. The annual congress is a truly global event, and in spirit of this, Russia and Baltic countries have been invited as this year’s guest region.

The congress is set to kick off in style, with more opportunities than ever for delegates to get close to subject matter and the latest research developments. Find out on page 20 which special sessions to look out for throughout the congress, and what we’re most excited to see in Vienna!
Day 1: Diagnostics

Day 1 of this year’s congress is all about diagnostics. Each of the sessions will focus on treatment planning, and will give you the information you need for choosing the best treatment options. Here are our picks for which sessions you should look out for:

- **Opening session and Live treatment session 1:** the EAO’s 27th annual scientific meeting will kick off with its first ever live treatment session. During the opening ceremony, the three world-renowned Austrian dental centres participating in the live surgery sessions will be introduced and followed by a short interview with their patients.

- **Hands-on workshop – My first implant: GBR:** this special session will be run by the EAO Junior Committee, and will give attendees the opportunity to take part in hands-on training exercises with pig jaws led by experts. This session is perfect for participants with less clinical experience: recently graduated dental students; postgraduates working in research but lacking clinical expertise; or experienced practitioners specialising in other disciplines.

Day 2: Surgical treatment

On day 2, we move from diagnosis to surgery. The sessions will be dedicated to surgical treatment and take-home tips to help you optimise your daily practice. Some of the sessions we can’t wait to see are:

- **Live treatment session 2:** this session will cover some of the hottest topics in implant dentistry: 3D dentistry and guided surgery. Three teams – one from each of the Austrian dental institutions – will present their cases live.

- **Dreams & reality session 2:** in the current landscape of implant dentistry, it’s common to encounter ‘risky’ cases. The key to success is knowing how to manage and reduce risks. Speakers will discuss how to identify risks in digital workflows, flapless surgery and with bone substitute materials.

- **Battle of concepts 4:** this session entitled ‘How fast can we go?’ will feature two leading experts debating immediate and late approaches. This is a key decision facing clinicians, and this session will surely see lively debate and two fascinating view-points explored.

### Congress tips and tricks

Don’t forget to book your place at the **Mayor’s Dinner** on Thursday 11 October.

**EOA members can enjoy access to the VIP members’ lounge**

Find out more about what’s on during the congress at [www.eao.org](http://www.eao.org)
Vienna city gems

Our pick of stylish destinations for visitors to Vienna this October

**Stadtpark**
Statues of famous Viennese artists are scattered throughout this beautiful city park. Can you find them all?

**St. Stephen’s Cathedral**
Don’t miss your chance to see St. Stephen’s and take in the best view in Vienna.

**Schönbrunn Palace**
This magnificent Baroque palace is the former imperial summer residence in Vienna and a must-see.

**The Imperial Treasury**
Visit the most renowned treasury in the world, located in Hofburg Palace, Vienna.

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Day 3: Prosthetics and follow-up

The third and final day will focus on prosthetics and follow-up. And we have saved some of the best to last:

- **Battle of concepts 5**: when it comes to prosthetics, there have never been more choices available to use for abutment materials – so how do you know which to use? Some of the biggest names in implant dentistry will give you the facts you need to help you decide between titanium and zirconia.

- **Live treatment session 3**: don’t miss the final live treatment session at Vienna 2018. Each of the three patients treated during Friday’s live surgery session will be presented, including a surgical follow-up and patient interview.

- **European clinical video session contest**: during this session, seven candidates will present their clinical cases in video format. This innovative session will let you hear the best clinical cases from around the world, and the best presentation will receive the European prize for clinical video in implant dentistry.
Placing dental implants in the aesthetic zone requires a comprehensive understanding of basic restorative and biological concepts, combined with a mastery of delicate tissue management techniques. Cases involving two or more adjacent missing teeth pose an even greater challenge due to the loss of hard and soft tissues following extraction. This resorption is exacerbated when multiple teeth are removed at the same time. In these cases, a biological intervention involving hard and soft tissue regenerative procedures or a prosthodontic approach using pink ceramics should be undertaken to restore and compensate alveolar ridge deficiencies.

In this specific case, hard and soft tissue augmentation was performed to restore vertical and horizontal ridge deficiencies and thereby avoid the need for pink restorative materials. Additionally, a modified pontic design was fabricated to create a natural-looking harmony between the peri-implant tissues and implant-supported suprastructure.

This case presentation describes several biological approaches which were applied during the treatment-planning phase to determine the proper step-by-step timing and procedures required for a predictable outcome.

**Case**

A 59-year-old female was referred by her general dentist with the following chief complaint: ‘My front teeth look too long and need to be restored’. She presented to our practice in July 2011. She was receiving antihypertensive medication once a day to control hypertension which she had had for 10 years. Her vital conditions were within normal limits, although the patient occasionally recognised nocturnal para-functional habits.

An aesthetic evaluation was performed from the face level to tooth level (Figures 1.1–1.3). The facial midline, which was almost perpendicular to the inter-pupillary line, and the line of the bilateral lip corner were drawn. The patient’s lip line while smiling was moderate during the regular visit. However, the patient showed a very high lip line while smiling with emotion (Figure 1.1) (Tjan & Miller 1984). In order to judge which treatment modality (biological or prosthodontic) would be most suitable, a diagnostic wax-up was performed with reference to: anatomical features; lip line at smile; pictures taken at a young age; and F-, and S-sound evaluations. The prognosis of each tooth was evaluated to decide which should be extracted (McGuire & Nunn 1996; Zitzmann et al. 2010).

Following a thorough discussion with the patient, it was decided that all teeth except 13, and 16 would be replaced with an implant-supported prosthesis (Figure 2).
**Procedure**

A staged approach was undertaken to ensure the stability of a fixed provisional restoration. Hopeless teeth were used as temporary abutments throughout the treatment.

As has been shown in the literature, the extraction of several adjacent teeth at the same time leads to increased bone resorption and significant loss of interproximal bundle bone (Al-Hezaimi et al. 2011). Therefore, root submergence with orthodontic tooth extrusion was performed on teeth 12 and 21 at the planned stage of treatment (Salama et al. 2007; Salama & Salama 1993) (Figure 3).

On average, the rate of extrusion was 1–2mm/month, and power chain replacement was needed every 1–2 weeks. Applied force was 15–30g. Once the root was set in its planned location, a retention period of 2–3 months was required. After teeth 12 and 21 had been coronally extruded enough, the supra-gingival tooth structure was ground down until the root tip was submerged in the alveolar bone. The utmost care was taken not to damage the alveolar bone around the tooth.

The implant was placed in a prosthetically-driven position and simultaneous GBR technique was performed on teeth 11 and 12 (Figures 4.1–3). Autogenous bone chips were harvested from the implant site and placed over the exposed implant fixture. Anorganic bovine bone mineral was then layered over the autogenous bone chips in order to counteract the flap depression (Figures 4.4–5). Double-layered non-crosslinked collagen membranes were used to cover the bone particulates (Figures 4.6).

In order to prevent the underlying colour of the abutment from showing through, the soft tissue thickness on the buccal side must be at least 2mm.
Therefore, a sub-epithelial connective tissue graft was performed to increase the horizontal tissue thickness around the implant during the second stage of the procedure. At the same time, impressions for the provisional restorations were made (Figures 5.1–3).

A final provisional restoration with a modified ovoid pontic design was used to match the gingival contour with the initial evaluation which had assessed the patient’s function, phonetics and aesthetics (Figure 6.1–2).

The final restoration was placed in the maxilla. Because of the tooth extrusion and submergence procedures which had been carried out, the ridge height was preserved and the need for pink ceramics (which might have been exposed at full smile) was avoided. Finally, the interdental papillae were successfully preserved in the maxillary anterior region (Figure 8).

Conclusion

Implant therapy is an established and predictable option for treating a single missing tooth in the maxillary anterior region. In cases involving multiple missing teeth (especially if they are adjacent), a combination of biological and prosthodontic approaches are required. The treatment plan for this case called for a number of techniques: GBR, soft tissue augmentation, tooth extrusion and root submergence; additionally, the design of the restoration made use of cantilevers and a pontic design. These various elements were combined and carried out in the proper sequence in order to achieve a good balance between the implant supra-structure and peri-implant tissues.

Acknowledgement

Dedicated to my mentor, the late Dr Satomi Samantha Yamamoto, who was my professional and personal role model.

References


Figure 7.1–5: Final prosthesis in place. Gingival levels remained the same, and no abutment translucency could be seen because there was sufficient soft tissue volume on the buccal side.

Figure 8.1–3: Full smile with final prosthesis.
Founded in 2007, the Junior Committee (JC) is made up of eight young professionals active in the field of implant dentistry. Committee members are selected from different European countries, and only one member per country can be represented to ensure that the committee remains highly multinational and as wide a range of young professionals from across Europe as possible are represented. The current members of the committee are:

- Helena Francisco, Portugal (chair)
- Tommie Van de Velde, Belgium
- Sven Mühlemann, Switzerland
- Iva Milinkovic, Serbia
- Katarzyna Gurzawska, Poland
- Ferrucio Torsello, Italy
- Stefan Fickl, Germany

The aim of the Junior Committee is to represent the younger membership base of the EAO and build strong networks within the dental community in Europe for young professionals. Together, the JC has actively sought to gather and motivate young scientists and clinicians to help them exchange knowledge, experiences, and ideas.

As part of this, the JC has organised a number of unique activities and events specifically designed to encourage collaboration and scientific exchange between young researchers from a range of disciplines. These events usually take place at the EAO’s annual scientific meetings (at dedicated JC sessions) or throughout the year (JC Summer camps). The JC brings a dynamic and innovative energy to the committee structure of the EAO, representing the positive future of the field.
Battle of concepts

The Battle of concepts is one of the JC’s best-known initiatives. This special session format has featured in the scientific programme of the EAO annual congress for the past three years, and aims to showcase different approaches for challenges facing clinicians in daily practice.

Because of the rapid and continuous developments in technology and best practice, the number of treatment planning options has increased exponentially. It can be difficult to know which treatment principles to follow. The Battle of concepts sessions aim to outline different treatment options to resolve certain issues facing practitioners and give guidance on how to deal with these problems.

These sessions regularly showcase some of the biggest names in implant dentistry. At the Madrid 2017 meeting, three renowned speakers discussed different treatment approaches for a partially edentulous periodontally compromised patient. Tommie Van de Velde (Belgium), Ignacio Sanz Sanchez (Spain) and Ignacio Sanz Martin (Spain) each gave dynamic and illuminating presentations outlining different treatment approaches for this challenging case.

Battle of concepts sessions have already been organised for the EAO annual scientific meeting in Lisbon 2019, as well as at the German Society of Periodontology and Implantology meeting in 2019.

My first implant session

This year, the Junior Committee will be hosting another special session format at the annual scientific meeting. The ‘My first implant’ session will take place at the EAO meeting in Vienna, 2018 and will be the first of a series of hands-on courses covering a number of theoretical and practical topics. Hands-on training with various implant systems will be provided so everyone will get the opportunity to receive practical tips and tricks for placing implants.

The session will be especially useful for participants with less clinical experience: recently graduated dental students; postgraduates working in research but lacking clinical expertise; or experienced practitioners specialising in a discipline other than implant dentistry. All are invited to join this session and gain valuable experience with a number of basic implant treatment techniques.

Apply to become a JC member!

This year, we are opening applications for one new member for the Junior Committee. We are looking for an active and motivated young professional to join us. Applicants should be qualified dentists and under 37 years old. More information is available on the EAO website.

The selection process (including a short interview) will take place during the EAO meeting in Vienna 2018.
One of the most popular initiatives established by the Junior Committee has been its summer camps. The camps are the JC’s ‘trademark’ activity, and are the perfect setting for bolstering networking opportunities for young researchers and clinicians.

The first two summer camps were held in 2010 and 2012, at idyllic locations in the north of Italy. Both events were very well attended, with 40 colleagues representing ten European countries taking part. The first camp focused on ways to build a robust network for scientific exchange, and resulted in the creation of a web-based interactive platform to enable this. At the second summer camp, participants were encouraged to discuss a number of topics from different angles, and incorporating fields outside dentistry such as: tissue engineering, civil engineering, orthopaedic surgery and radiology.

The third summer camp was held in 2014. Participants from various associations in Europe and the United States were invited to identify the changes facing dentistry over the next ten years. Topics included: continuing education, certification, societies and associations, and scientific innovations. Findings from the camp were presented during the EAO meeting in Rome later that year.

And now the JC is pleased to announce that the fourth summer camp will be taking place in Lisbon, Portugal in May 2019. Once again, a group of 40 young professionals will come together and take part in dynamic activities including innovative sharing formats.

Details on how to apply will be announced soon. Anyone curious about the JC and who would like to become a part of the next generation of the EAO should apply. More information about the application process will be made available at the EAO meeting in Vienna, October 2018.