



# ADI 2005 CONGRESS - EDINBURGH



## THURSDAY 12 MAY

Session Chairman  
 - **Dr PAUL STONE**  
 - ADI President

**T**he President welcomed an expectant audience to the **ADI Congress in Edinburgh** to hear the 24 internationally acclaimed speakers over the following three day Congress.

He announced that the Congress was full and that late comers had been turned away.

He congratulated the **Royal College of Surgeons of Edinburgh**, the oldest College in the world, on their **Quincentenary** celebrations in Edinburgh during 2005.

He explained that each of the main podium

speakers would have a full hour lecture time followed by 15 minutes of questions as requested by participants at the **2003 Congress in Birmingham**.

He thanked the 8 major sponsors, **Astra Tech, Biohorizons UK, Geistlich Biomaterials, Dentsply Friadent, 3i Implant Innovations, Nobel Biocare, Osteo-Ti** and **Straumann** for their generous financial support of the **ADI Edinburgh** congress.

Dr Stone warmly welcomed **Mr Hew Mathewson, President of the GDC** to open the Congress.



**Mr. HEW MATHEWSON**  
 - President of the GDC

**M**r **Mathewson** expressed his delight that so many delegates had come to his home town of Edinburgh and congratulated the President on the outstanding scientific programme about to take place.

The President opened his address by explaining the role of the **GDC** was essentially to look after the education of dentists and to keep the profession regulated properly for the advantage of patients.

He suggested that today there was much more emphasis on competence and the introduction of health procedures for those who have problems while compulsory **CPD** was proving highly effective.

He stated that the **GDC** actively visits dental schools to ensure that standards were being maintained. He explained that the qualification status for

basic degrees was quality assured and asked whether specialist lists were working for patients. He advised that a review would be looking at the whole area of specialist lists and looked forward to having dialogue and response from as many dentists as possible in the coming months.

Regarding implants, he mentioned that there were concerns at the **GDC** that some very good colleagues had got into trouble with implant problems and there were serious concerns at the inadequacy of implant training.

He explained that the **GDC** had set up an implant dentistry group to review current good practice guidance; to review the existing qualifications; to review the existing training programmes offered by Universities and other course providers and to make recommendations on how the public could best be protected.

He applauded the work of the panel under Mike Martin and reported that Paul Stone as President of

the ADI, had sat on the panel. The group had recommended that for the protection of the public, guidelines for implant dentistry should be established; that standards should be set for postgraduate qualifications in implant dentistry; that a meeting should be convened of relevant groups to establish and publish a set of core guidelines in implant dentistry over the next few months and that Implant dentistry should be a GDC recognised specialty.

He further explained that the latter was not a matter for that working group as it would be discussed in the full context of the specialist lists that were under review.

He mentioned that there were however problems in that implant dentistry did not really fit into any existing specialty areas - it straddled a number. He asked whether one would have to demonstrate competence in both surgery and restorative aspects or simply one; whether there was indeed any need

for a recognised speciality or would it be better for training for high street practitioners, or both? He asked what was the correct balance - whether to allow dentists to practice within the limits of their own competence which is what self regulation was about and restricting practice to a specialist group that might well not be in the patient's best interests. **He asked who would set the standards? The GDC? The dental faculties of the Royal Colleges? The FGDP? Specialist societies?**

**Hew Mathewson** concluded with stating that there was a clear need for core standards and better training and invited everybody present to make their points of view known to the GDC in the specialist review survey by **17 June 2005**.

The ADI President thanked **Mr Mathewson** and welcomed delegates to chat with him at the evening reception at **Edinburgh Castle**.



## Dr. HENRY SALAMA - Atlanta USA

### Success by Design: Integrating Biology, New Implant design and Esthetics in Simplified and Complex Therapy

Report by Dr Anthony Bendkowski

**This was a high quality introductory lecture from a world renowned speaker, making an excellent launch to the very successful 2005 ADI Congress.**

**Dr Salama** introduced his lecture with reference to Team Atlanta and his work with his colleagues, **Dr David Garber** and his brother **Dr Maurice Salama**, which is underpinned by a philosophy of a team approach. He further described that their treatment planning and decision making process is constantly evolving. He put forward the idea that the whole of implant dentistry is in fact 'work in progress' as new research and information continues to evolve.

The notion that implant dentistry constantly involves 'decisions, decisions, decisions' was explored. This was exemplified by aesthetic challenges, such as low lip line vs. high lip line, and further challenges from cases involving thin scalloped periodontal tissues. Further decisions regarding immediate vs. delayed placement and loading also needed to be made. The list continued with bone augmentation - should one choose autogenous over allograft materials for bone repair?

Other areas requiring decisions by the clinician centred around the use of platelet-rich plasma and platelet-derived growth factors, assessing the advantages of flapless procedures, and significant issues regarding implant design, the microgap, scalloped implants and unibody implants. **Dr Salama** highlighted the difficulty of assessing which innovations and improvements would give the best results. Wisely, he also cautioned regarding the prescription of implant work for some cases where conventional crown and bridge procedures may in fact be more appropriate. Implant work could only be justified if one expected to achieve predictable results in the same way as crown and bridge.

**Dr Salama** felt that a number of issues were still open to question and that there would no doubt be further evolution, but he did feel that the biggest challenges were faced in the anterior aesthetic zone, particularly with the discerning and demanding patient. He highlighted that implant treatment is as vulnerable as conventional bridgework to problems of soft tissue management, with the loss and remodelling of the papilla being a potential 'marvel

or menace'. With soft tissue considerations, placing the microgap in too close contact with the labial plate would inevitably lead to bone loss and a consequent soft tissue discrepancy. During immediate implant placement, a subsequent  $1/2$ mm of recession is often accepted. For predictability he suggested that ways should be explored of minimising recession.

**Dr Salama** thus evolved a theory of three types of extraction socket defect dependent on the integrity of the labial plate and type of bone defect.

If the labial plate is found to be intact, implants should be placed parallel to the axis and at least 1mm from the labial plate of bone with a palatal bias. The implant should be placed about  $1/2$  mm below the bone crest. Any associated defect could be repaired with a mix of autogenous bone and allograft with the addition of **PDGF (Platelet Derived Growth Factors)**.

The bone gap was not in fact a problem, since the work of Botticelli seems to indicate that bone will grow into this gap provided the gap is not too great - the so called biological jumping distance. The idea was put forward and that the graft material was simply there to maintain a fibrin clot facilitating the movement of osteoblasts down to the implant surface.

Immediate non-functional loading could be considered with the restoration being temporarily retained with a flowable antibiotic ointment. The initial temporary restoration should be under-contoured to preserve soft tissue before the definitive restoration, which could be finalised in conjunction with the newer zirconium abutments. This rationale minimised components and time to achieve a predictable successful outcome.

The idea of pre-extraction orthodontic extrusion was explored as a very useful technique to improve soft tissue availability prior to commencing implant treatment.

By contrast, the more challenging situations with significant bone loss in patients with high aesthetic needs were explored. **Dr Salama** strongly confirmed that wrong treatment decisions would expose both patient and surgeon to risk of poor outcome and he stated that most failures could be attributed to misdiagnosis and poor treatment planning. This was exemplified by the situation of three adjacent missing teeth in the aesthetic zone. A decision to place three implants could result in

these being too close together with resultant significant soft tissue problems.

This problem could be avoided by using two implants and a three-unit bridge with soft tissue control being achieved through correct use of an ovate pontic form.

Common pitfalls encountered in these more complex cases included implant placement too far above the crest or too far labially, hence the need for careful planning and assessment from the outset.

**Dr Salama** showed a very interesting video for the treatment of a fractured central incisor involving a minimally invasive incision, removal of the tooth, immediate implant placement 1 mm from the labial plate and  $1/2$  mm below the bone crest, bone repair with autogenous bone and Pcpge P15 to over-correct the contour, and subsequent immediate restoration with an under-contoured temporary to preserve soft tissue profile. Platform switching was utilised to minimise crestal remodelling.

Further cases were used to demonstrate the use of pre-extraction orthodontic extrusion to improve soft tissue in difficult cases. The importance of a minimum inter-implant distance of 3mm was emphasised with the evidence of **Dr Tarnow's** research being cited. The importance of over-building bone augmentations was discussed, with an expected consolidation or shrinkage of the graft by up to 25% being anticipated. The subsequent use of connective tissue grafts derived from the palatal area adjacent to the upper premolars was also discussed.

In conclusion, **Dr Salama** drew upon 16 years of experience in evolving a predictable approach to soft tissue stabilisation and consequent successful aesthetic outcomes. Preservation of the peri-implant tissues is the key factor to a successful aesthetic outcome and thus **Dr Salama** is a keen advocate of immediate and early implant placement and non-functional restoration wherever possible.

Following this well presented talk, **Dr Salama** received positive questions from the floor in what proved to be the first of many interesting interactive question sessions during the following days of the **Congress**.



**Prof. MASSIMO SIMION** - University of Milan, Italy

**Hard and Soft Tissue Management in Esthetic Implant Restoration**

Report by Dr Adrian Binney

**P**rof. Simion began by thanking the ADI for inviting him to present at the meeting. He listed the important anatomical determinants of aesthetic implant restorations:

- Quality of soft tissue
- Bone width
- Bone height
- Single tooth replacement
- Multiple tooth replacement
- Loss of attachment around the adjacent teeth

**Prof. Simion** emphasised that these are very important for implant success and especially important for a successful aesthetic outcome. He went on to demonstrate the above points in turn with cases showing in detail the importance of bone volume and soft tissue profile in achieving an ideal final aesthetic result. He also emphasised the necessity of the interdental bone peak to provide satisfactory support for the soft tissues.

**Prof. Simion** highlighted that when removing 2 adjacent teeth the interdental peak is lost in 2-3 months. This then provide significant problems in recreating the soft tissue profile in this situation. **Prof. Simion** quoted two well-known papers to support his point:

**Regeneration of interdental soft tissue following denudation procedure.** Van der Velden J.Clin. Periodontol. 1982 9: 455-459. This outlined the limits of grafting with soft tissue, indicating that both bone and soft tissue are required together for stability.

The effect of the distance from the contact point to the crest of bone on the presence or absence of the interproximal dental papilla. **Tarnow DP, Wagner AW, Fletcher P J. Periodontol 1992; 63:995-996** outlined need for bone shape and support to maintain papillary anatomy.

The next stage of the presentation focussed on alveolar bone preservation in immediate loading cases. Detailed slides demonstrated the required factors for success. One of the most important features was the necessity for a space on the labial

aspect of the implant for graft material. **Prof. Simion** advised a combination of BioOss and autogenous bone chips. This provides architecture for new bone and prevents any chance of pressure on the labial plate of bone from the implant which can lead to bone loss. The timing for the replacement of a single tooth was then outlined in detail, emphasising the care of the bone profile at all times:

- Extraction
- 1st stage GBR
- Abutment condition
- Provisional restoration

**Prof. Simion** emphasized the need to maintain the level of bone at the buccal bone plate during surgery in these cases and the need to have a 360 degree bone presence around implants for good soft tissue support and consequently good soft tissue profile.

In cases where there was already extensive lost bone a different protocol should be observed. **Prof. Simion** advised the simultaneous approach for these cases, rebuilding carefully in stages;

- Simultaneous approach
- Extraction
- Wait 2 months
- First stage GBR
- Wait 4 months
- Second stage GBR
- Wait 1 month
- Implant placement with Provisional Restoration

**Prof. Simion** advised the staged approach when risk of implant is high or the chance of a poor aesthetic result is high. This is a more predictable way to achieve good results by correcting bone profile first then considering implant placement at a second stage. This takes the site from being a compromised situation to an ideal situation before considering implant placement the advantage being that a staged technique produces soft tissue which can then be manipulated since the quality and the quantity of the tissues are improved.

**Staged approach**  
**Extraction**  
**Wait 2 months**  
**GBR**  
**Wait 6 months**  
**1st stage surgery**  
**Wait 6 months**  
**2nd stage**  
**Wait 1 month**  
**Implant placement with Provisional Restoration**

**Prof. Simion** then outlined several cases with detailed and accurate slides, ranging from straight-forward cases to very challenging ones showing how adhering to the guidelines he had outlined could achieve predictable result in both simple cases with good hard and soft tissue profile and very challenging cases where hard and soft tissue have been compromised.

**Prof. Simion** explained and demonstrated the need to over-correct the soft tissues to account for the recession which is predicted.

He outlined the 'roll flap' (Abraham 1980) as a less invasive technique to provide the necessary soft tissue bulk.

He emphasized that in the aesthetic zone a palatal position of the implant head is very important as the tissues can then be easily manipulated to achieve a good aesthetic result. He advised use of a short healing abutment to allow overgrowth of the soft tissues which can be utilised later. If long and wide abutments are used then tissue shrinkage is more likely.

**Prof. Simion** presented a detailed set of slides showing positioning of implants in three dimensions, demonstrating the points outlined in clinical situations.

The progression is to place a first provisional restoration which will be 'ugly'. The slides shown did demonstrate the short and narrow nature of these temporary crowns, a rather compromised aesthetic result in the short term whilst tissue maturation occurs. There is no compression of the soft tissues at this initial stage. If the abutment places pressure on the tissues at this stage then the tissues can recede: as the tissues mature, the emergence profile is progressively produced by modifying the temporary crown, slowly providing progressive pressure on the soft tissues. When describing pressure he explained that blanching only for 5 min was an indication that the pressure was not excessive. Excessive pressure at this stage could still cause recession. **Prof. Simion** advised modifying the temporary crown at 1 month intervals, correcting the emergence gently.

The relining can take 6 months at which stage the final aesthetic restoration can be placed. The papillae

will be mature at this stage and therefore stable. It is important that the emergence profile is accurately transferred to the lab using an acrylic transfer jig.

**Prof. Simion** went on to show more difficult cases with more advanced bone loss, both labially and vertically. He advised trying to avoid vertical relieving incisions when placing implants to minimise the disturbance of the blood supply to the bone and thus minimising damage that may be sustained by thin bone areas.

Particulate grafts can be used labially to maintain the thickness of soft tissues at the gingival margin. He advised the use of a particulate allograft as a slowly resorbable graft in addition to a connective tissue graft. This provides stability of the soft tissues and can remain in situ for long periods acting as a framework for the tissues.

**Prof. Simion** focused on the Nobel Perfect implant, emphasising the care needed to place the implant properly taking into account its unique asymmetrical cervical contour. He emphasised that it was essential to close the soft tissues in these cases without tension to ensure minimal bone resorption. A short video detailed the incision to avoid damage and protect gingival tissue.

**Prof. Simion** demonstrated soft tissue flap design and the positioning of the implant palatally. He emphasized the need to keep the position of the drill palatal, especially as the natural tendency of the bur is to move buccally into a poor position for ideal implant placement due to the denser bone palatally.

Alongside the incision for implant placement he again demonstrated the harvesting of the connective tissue from the palate and the need for careful suturing of the flap to prevent haemorrhage. This technique enables soft tissue and gingival length correction without tension. Four months of healing are allowed till the soft tissues are mature and healthy. At this stage the case should then be ready for prosthetic treatment.

In cases with compromised sockets **Prof. Simion** explained the need to observe 2 months healing before implant placement. This allows more predictability of the final tissue positions.

Block grafting with the use of a bone screw to stabilise the block was shown. A titanium-reinforced ePTFE membrane is preferred as the primary guided bone regeneration (GBR) technique using Bio-Oss and autogenous bone which tends to keep its shape better than autogenous bone alone.

By grafting the bone correctly then it is possible to place the implant correctly with sufficient bone support to maintain the soft tissues.

**Secondary GBR** may be needed to protect the underlying developing bone and support the soft

tissues. Bio-Oss again is preferred, using a membrane to 'plump' out the soft tissue and provide stability of the graft. **Prof. Simion** explained the need to avoid tension in the sutured flaps to protect against necrosis especially in the papilla areas.

**Prof. Simion** finally outlined a case having 4 anterior

teeth lost with advanced bone loss detailing the augmentation of hard and soft tissue to correct the defects at all stages. His preferred prosthetic solution was 2 implants in the lateral incisor positions supporting the central incisor pontics to allow more predictable papillae manipulation.



## FRIDAY 13 MAY

Session Chairman

- **Dr MICHAEL NORTON**
- ADI Scientific Adviser



**Prof. JED DAVIES** - University of Toronto, Canada

## Strategies to Regenerate Bone

Report by Dr Steve Byfield

**P**rofessor Davies traced the evolutionary development of bone for 540 million years from the exoskeleton of proto fish, many years more than humans have been on the planet.

Bone is a dynamic tissue with 3-5 % of bone remodelling at any given time for an individual's lifetime. He stated that if the body is able to lay down enough woven bone in the correct place, the body can be relied upon to eventually replace it with organised lamella bone.

Osteoclasts are derived from mononuclear cells, which circulate in the blood stream and osteoblasts are from osteogenic cells or mesenchymal stem cells which are found in the tissue spaces and bone marrow.

Osteoclasts are fed into the tissues continually by the blood stream. Around the blood vessels are another population of cells called pericytes, undifferentiated mesenchymal cells, which have the ability to differentiate into osteoblasts and lay down bone around the vessel wall gradually reducing the diameter and filling in the space.

We know that the osteoclasts and pericytes

communicate by chemical signals such as growth factors. We can demonstrate this by placing a macrolide proton pump inhibitor inside calcium phosphate cement which prevents the osteoclasts from removing bone. However they continue to send signals to the osteoblasts in the surrounding bone and thereby bone is laid down without initial resorption. **Professor Davies** suggested that a future clinical application may be to place a pellet of the above cement in an area where there is poor bone volume and/or density such as the posterior maxilla. Following a period of time the bone would increase in quality, quantity and density.

**Professor Davies** stressed the very different healing process in cortical and trabecular bone. He quoted **Gray's Anatomy** when stating it takes 5 years to remodel an osteonal system in a femur. Hence the length of time required in the earlier implant systems before loading, even in the anterior mandible.

More recently higher success rates are being achieved placing implants into trabecular bone where there is virtually no bone mineral. Stability in cortical bone is easy as with a screw in a piece of wood. In trabecular bone the stabilisation has to come from the bone marrow cells directly to the surface of the implant.

**Professor Davies** stated that bone itself does not spread and bone does not 'grow' but propagates. Once an osteoblast makes bone matrix on a surface the matrix cannot move or 'flow' around an implant. What actually happens is that an army of cells migrates ahead of the bone matrix being laid down to extend the bone front. Micro textured surfaces of implants allow this process to occur more efficiently.

The mechanism where bone cells are encouraged to migrate from the bone marrow to an implant surface is called osteoconduction. The first substance in contact with an implant following insertion is the blood clot. Therefore any osteogenic cells have to find their way through the blood clot to the implant surface.

**Professor Davies** described the processes involved during the initial stage of implant placement. Following the trauma of implant placement, platelets are activated and release their contents of 25 or so cytokines and growth factors. These in turn activate platelets and white blood cells adjacent to and distant from the site. This creates a concentration gradient. The osteoblasts move towards the gradient and move by pulling themselves along the fibrin of the blood clot until they reach the implant. The osteoblasts change shape, become polarized, secretor-active and start depositing bone matrix on the implant surface. They then lay down the collagen component and become trapped in the matrix to form osteocytes, being replaced by new cells to lay down more bone.

He mentioned experiments which he has carried out which demonstrate more platelet activation and

fibrin adhesion of micro textured surfaces when compared to smooth surfaces. **Professor Davies** described a large amount of literature to show increased healing on a calcium phosphate surface. He recently carried out a series of experiments where he found that the more topographically complex the surface, the more platelet stimulation and activation occurred. If there was a smooth surface little bonding would occur. It is the micro-topography i.e. features equal to or less than the size of a platelet, which encourages adhesion of tissues.

He discussed the possibility of the best of both worlds with a metallic implant and calcium phosphate surface bonding. Unlike previous plasma sprayed calcium phosphate implants, this layer would be as thin as 1-5 microns, its function changing the micro topography of the surface at a microscopic level. The results of this from **UCLA** showed a significant increase in shear strength of bone to implant.

**Professor Davies** described a future development in stem cell therapy by placing them in bioreactors allowing multiplication and placement on the cells in scaffolds with associated bone formation.

He finished where he had begun, discussing the bone regenerator cells. **Professor Davies** stated that, on average, for every 100,000 enucleated cells from bone marrow there would be only 1 mesenchymal stem cell. In a newborn it would be 1 in 10,000 from marrow but only 1 in 200 million from cord blood which presents a real therapeutic problem. The main source may come not from cord blood but the cord itself where a greater number of mesenchymal stem cells are available.



**Dr LYNDON COOPER** - Chapel Hill, USA

**Treatment Options and Strategies for the Edentulous Maxilla**

Report by Dr Jeremy Harris

**L** yndon Cooper is not a name well known to many implant dentists in this country, but he is an accomplished and renowned researcher and clinician within the field. He is Professor of Dentistry at the Department of Prosthodontics, University of South Carolina and holds other positions both clinically in prosthodontics and research with his main interest being bone histology.

Given the present preoccupation in implant dentistry to maximising soft tissue aesthetics, particularly in

the anterior region, this topic may have at first glance been perceived to be another 'old and dry' topic that most would have covered during their early years in implantology.

In reality, **Dr Cooper** produced a very coherent, thought provoking and detailed presentation that combined basic prosthodontic principles of treatment planning with today's knowledge and experience of immediate loading and placement in relation to predictable, consistent, functional and aesthetic outcome.

**Dr Cooper** started by looking at the results of various studies undertaken at the University of South Carolina, regarding patient's response to tooth replacement in its various forms. Salient points here were:

- 62% of patients in the study sought treatment because the 'denture doesn't fit'.
- 25% of denture wearers were averse to wearing removable dentures.
- Patients had a negative view of the Implant treatment procedures, due to lack of teeth during the various phases.
- Implants showed an 82% success under over-dentures.
- Many patients were happy with a conventional denture if fit and function were good.

Some of the conclusions reached were that delayed failures in the posterior maxilla were more common than thought. This seemed to be a question of the bone / implant contact area and is improved by the modern approach to surface texture and chemistry of implant surfaces.

Implants are not a panacea for all patients and situations. Many patients are happy with a decently fitting, well designed and constructed denture. To paraphrase **Dr Cooper** 'you had better be sure the predictability of the final outcome if aesthetics are a prime concern, as it is difficult to compete with (the aesthetics of) a good denture'.

**Dr Cooper** then spent a considerable time looking at treatment planning and also planning of treatment, particularly a transitional approach where the remaining natural teeth are removed in a controlled sequence.

This allows several advantages;

- It avoids a full removable provisional prosthesis.
- Allows time for grafts to mature and also protects the graft from functional overload during the healing process.

**Dr Cooper's** systematic approach to the planning process starts with basic prosthodontic principles, particularly in deciding on the position of the central incisors and canines. There are many well established aesthetic, position and phonetic guidelines and we have perhaps forgotten or overlooked those aspects with our preoccupation with the latest 'fashions' in Implant dentistry, e.g. the canines in relation to the first rugae incisors in relation to the nasopalatine papillae and the incisal edge to the vermilion border while making a 'long F' sound. The denture constructed from this diagnostic

process may never be worn but will act as a template for tooth guided augmentation and Implant placement. CT scans depend on good preliminary prosthetics and a duplicate denture with the flange removed gives a good indication of the distance of the tooth to the alveolus.

**Dr Cooper** firmly advocates grafting procedures to improve the alveolus rather than using a shorter implant or extreme abutment angles, particularly in areas of questionable bone quality and quantity. This diagnostic process might lead you to change the 'goal', such as the need for grafting or the use of an overdenture instead of a fixed reconstruction.

This all has to be related back to the patient's expectations and the final result should be envisaged before starting. If augmentation is necessary but not identified at the planning stage, we can finish with implant supported teeth which are biologically adequate but architecturally wrong. Augmentation improves aesthetics!

In conclusion, this was an extremely elegant presentation, which makes all of us pay particular attention to the planning process, which in turn needs to be based on sound, established prosthodontic principles and techniques, we all know this, but perhaps don't apply routinely enough, eg:

- Assessment of function and aesthetics.
- Bone quality.
- Define the limitations of treatment.
- Use of mounted models.
- Diagnostic dentures for augmentation and Implant placement.

Tooth position has to be the ultimate guide for treatment. As **Dr Cooper** says, the treatment plan or goal may change as a result of detailed planning but the planning should never change.





## Prof. Dr MARKUS HUERZELER - Munich, Germany

### Single Step procedure in the Aesthetic Zone - Fact or Vision

Report by Dr Stephen Jacobs

**T**his was a most entertaining, informative and enlightening presentation, delivered with Professor Huerzeler's usual passionate and humorous style.

**Professor Huerzeler** began by saying that his opinion on this subject has changed over the last ten years. Many controversies had become apparent and as a result some common sense needed to be applied.

There were two broad categories of approaches to aesthetic implant-based tooth replacement in the aesthetic zone: a staged one involving multiple procedures and surgeries, or single step.

The first case that was shown illustrated a staged approach and involved four surgical procedures, including an amalgam tattoo removal. A successful outcome was demonstrated and the tissues were stable after seven years. The essence of this case was to '**reconstruct what had been lost**', in that hard and soft tissues were replaced.

However, **Professor Huerzeler** made the point that if we could consider a single step procedure, this would surely be more attractive to patients. This was highlighted in the next case where a tooth was extracted, the implant placed and immediately provisionalised, with the final restoration fabricated after six or seven months. The approach was not reconstruction of what had been lost, but '**the preservation of what is there**'.

In practice, this could be a very difficult decision and in making this decision, we need to assess most carefully, the expectation of the patient and match it to the reality of what can be achieved. If there is a large enough difference between these parameters then that patient should not be treated, regardless of whether the single step approach involves less cost, less pain or less time.

**Professor Huerzeler** posed a number of questions in respect of the single step procedure;

**Can we place implants into extraction sockets?**

**There is now good evidence that we can.**

**Does guided bone regeneration work in a non-submerged environment?**

**There is some data available to show that it can be done.**

**Can we provisionalise implants immediately?**

There is much literature available showing varying results, but not enough randomised clinical studies. In fact only one study assessed the aesthetic outcome and this leads us to the next question.

**Can we achieve an aesthetic outcome?**

Osseointegration is not enough today and there is not enough evidence to show predictable aesthetic success just yet.

**What defines soft tissue profile?**

Periodontal biotype is crucial. For example, single step procedures should never be carried out in a case with thin/scalloped tissue. **Professor Huerzeler** then showed a series of successful cases and demonstrated that they were all carried out on patients with a thick/flat biotype. He explained that this was almost a prerequisite for anyone planning a single-step approach in the aesthetic zone.

It is necessary to sub-divide the circumferential zones of the soft tissue profile into proximal and facial areas.

The soft tissue profile of the proximal site is determined by the distance of the contact point to the bone crest, although this is not always predictable in reconstruction cases, even allowing for the 5mm rule as described by **Tarnow** in 1992.

The facial site is determined by the tissue thickness and the oro-facial tooth position. **Professor Huerzeler** showed that the height of the facial tissue is 1.5 x the thickness. Thus, the strategy that should be employed in these cases should be, where possible, to increase the thickness of the tissue on the facial side and as a result, the residual height should be predictable.

This subject was summarised in that the soft tissue profile is defined by the height of the bone crest and the thickness of the tissue.

There is published data now comparing the staged and single step approach. Papilla predictability and

also the facial site are much better with the single step protocol. The reality is that we need to be careful and that it is not just that easy, in so far that there is still recession with immediate implants, but this can be minimised when thick tissue is present. There is little doubt that the single step works better in the papilla area than the facial side, in all situations.

**Ideas for single step treatment planning**

The single step method only applies to a small number of patients, but for those it is a great treatment modality.

Orthodontic extrusion of the tooth, prior to extraction, to build, or over-build, the site with hard and soft tissue. It was not clear how long the extruded tooth should be retained prior to extraction, as re-shrinkage of tissue was a risk. **Prof Huerzeler** recommended six months.

Controlling the emergence profile of the provisional and definitive restorations and on this subject, the under-contoured provisional, as advocated by many, was challenged as being ineffective.

**Stabilisation of the marginal tissue.**

Assess the socket at extraction;

If the buccal plate is intact, then single step can be considered.

If there is a fenestration of the buccal bone, then single step could be carried out, but only with repair.

If there is a dehiscence present, the single step approach should not be carried out.

Considering that the thickness of the tissue is a key factor, we can increase this thickness with connective tissue grafts, modified tunnel techniques and sometimes a microsurgical approach is indicated. **Professor Huerzeler** illustrated this by showing a video of such a surgical technique.

Also guided bone regeneration could increase the

thickness, but tissue height could only be increased by orthodontic methods and distraction osteogenesis.

**Professor Huerzeler** then showed a series of cases illustrating the range of soft tissue biotype classifications that need to be assessed.

The first one was a thick / flat periodontal biotype and a good result was achieved.

The second case was thin / scalloped with some horizontal tissue loss. His approach was to increase the thickness of the tissue first, wait three months and place the implant with an immediate provisional restoration.

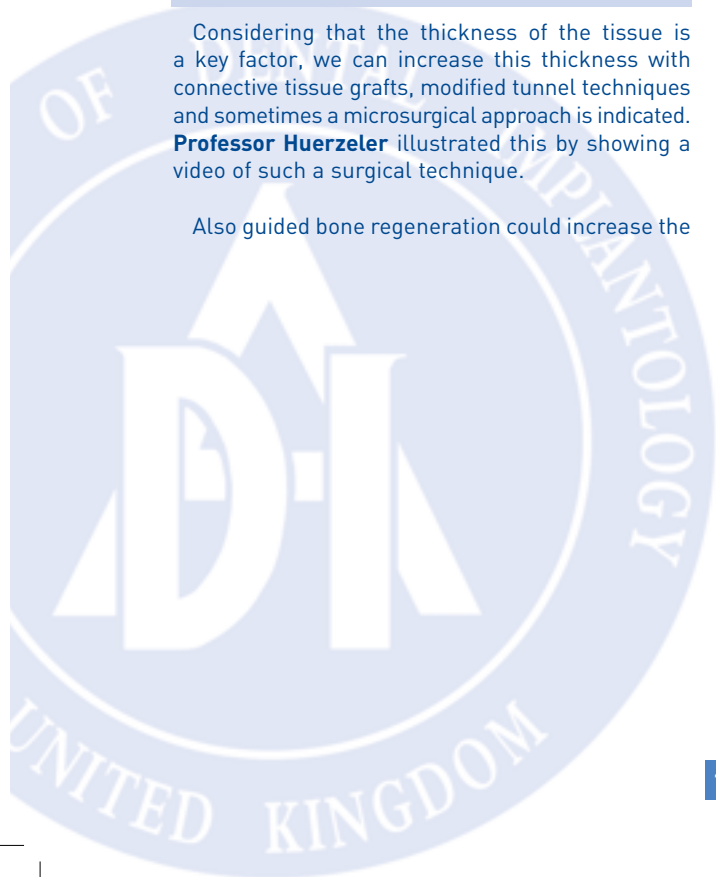
The third example was also thin/scalloped but with some vertical bone loss. A staged approach was needed where the tooth was extruded and a period of six months was allowed before the implant was placed in a single step, a resin bonded bridge being placed as a provisional restoration.

Platform switching as is now being increasingly mentioned in the literature and could play a larger role in the future of controlling aesthetics of the marginal tissue in single-step procedures on certain patients.

**Summary**

Single step procedures can present a major improvement for patients, but it is a high-risk strategy in challenging and difficult cases. The thick/flat biotype is almost an absolute requirement to generate good aesthetics in a single-step case. Therefore all clinicians need to be very selective and the message, as in all implant dentistry, is case selection with good assessment and treatment planning.

**Professor Huerzeler** gave a highly entertaining presentation delivered in a clear and concise manner, projecting a high standard of clinical photography and video, demonstrating the work of a most talented clinician.





**Prof. Dr DANIEL BUSER** - University of Berne, Switzerland

## Implants in Extraction Sockets: The rationale for the concept of Early Implant Placement

Report by Dr Richard Latchford

**P**rofessor Daniel Buser regards the concept of immediate and early implant placement as controversial. He expressed his concerns and worries about these techniques which have increased rapidly over the last five years. He would like to see further discussion and advocates an alternative to immediate procedures to control the pitfalls. There has been a rapid world-wide increase in implant procedures. The largest expansion has been in single tooth placement. In his department of Oral Surgery at Berne this now represents about 60% of implants placed.

**Professor Buser** is concerned that there is still very little undergraduate training with few arrangements set up for post-graduate and continuing education. Of particular concern is the rapid development of 'novel' techniques such as immediate placement, together with flapless surgery and immediate loading and restoration. There is a lack of scientific documentation to support the wide-scale use of these new techniques. In his opinion there is too much hype and show-business at conferences with too much influence by implant companies, with a real danger of implantology slipping back to the poor reputation held in the 1970's.

**Professor Buser** discussed the timing of implant placement following extraction with regard to predictability, benefit to practice, complexity of procedure, risk and cost effectiveness. In Berne, 90% of patients are referred from private practice from about one hundred referring dentists. In 2004, 776 implants were placed, 238 in the aesthetic zone for partially edentulous patients. 20% of patients were less than 30 years old, usually referred for treatment

as a result of trauma or congenitally absent teeth. 50% of patients were over 50 years old and were usually referred for perio/endo problems or for root fracture. The main role of the department is education of post-graduate students in oral implant surgery, with a preference for surgical techniques with high predictability.

Treatment outcomes were dependant on a complex mix of clinician, patient, treatment approach and implant system. Immediate (i.e. same day) early (i.e. 4 to 8 weeks) and late placement (i.e. 6 months) were discussed. Immediate placement had several disadvantages. Implant bed preparation is more difficult often requiring bone augmentation with primary soft tissue closure being more difficult. Sites were often infected. Skill and experience were key factors and should not be underestimated.

A protocol for early placement was advocated. This is important for a good aesthetic result; a harmonious gingival line and papillae in good bone of which good buccal bone has been 'undervalued' historically. Extraction without flaps is advised with collagen plugs to fill the socket. After soft tissue healing the implant can be placed in the correct three dimensional position with a correctly selected implant, i.e. smaller than tooth diameter. Bony defects can be filled with autogenous bone with a covering of Bio-Oss over the top, providing protection against resorption together with bulk and stability to the flap membrane.

A brief discussion followed with four questions from the floor concerning the use of alternatives to Bio-Oss and membrane, the use of collagen plugs to stabilise coagulum and late healing of sockets.



## Dr. FRANK CELENZA - New York, USA

### Implant Interactions in Orthodontics

Report by Dr Marty MacAllister

**D**r Celenza practises from his offices on 5th Avenue in NYC, is a dually qualified specialist in both Periodontics and Orthodontics, and is Associate Clinical Professor at New York University.

Dr Celenza introduced his presentation by expressing how 'implants changed everything', and that within dentistry, orthodontists were not as effected by this change as other dentists.

However, there were two areas where implants were integrated into other disciplines within dentistry.

Preparatory to implant placement, orthodontic modalities were seen as very important, whether it be paralleling teeth and creating space or tissue modification. This was not the context of the lecture.

Utilizing Implants as anchorage which Dr Celenza described as 'really exciting'.

#### Utilizing implants as anchorage:

There are two types of orthodontic anchorage, direct and indirect.

Newtons Third law of Motion states that 'Every action has an equal and opposite reaction'

Anchorage is defined as 'a body's resistance to movement'.

Within orthodontics, previously there was a classification which included three types of anchorage, namely minimal, moderate and maximum anchorage.

Since the advent of Implants, a new fourth classification of anchorage is noted. This is described as absolute anchorage which is the new ultimate classification of anchorage. It is predictable and places treatment entirely within the control of the orthodontist. The literature would suggest that implants seem to like orthodontic force, in that bone tends to become denser around them.

Within physiological limits, endosseous implants provide excellent anchorage.

Dr Celenza then showed using wonderful Adobe Morph graphics an example of implant-driven anchorage. As opposed to moving the teeth one by one and increasing the minimal anchorage through moderate anchorage, he showed a mandibular case

where three teeth in the buccal segments were moved 'en masse', using implants as anchorage. Multiple chain elastics were used to move three teeth simultaneously rather than sequentially, showing that absolute anchorage allows the orthodontist to work opposite to his conventional thinking of moving teeth one at a time to minimise orthodontic anchorage slippage. In the lower arch, this eliminated the need for an upper fixed appliance (which would conventionally have provided the anchorage for Class III traction). It also needed minimal patient compliance!

A second example, where a patient had advanced periodontal disease in the molar regions, and crowding anteriorly, Dr Celenza made the point that in the past, he would have struggled to save the molars by surgical intervention, hemisectioning where required etc, whereas now, early sacrificing of the teeth allows implant placement and subsequent anchorage for alignment of the imbricated incisors.

A Class III patient, with a missing molar, followed this. Dr Celenza showed, that by placing two implants, it was possible to align 11 teeth 'en masse'. There was no sequence to tooth movement, just simultaneous retraction of the 11 units over a period of 9 months, replacing chain elastics fortnightly. A case like this would normally have required orthognathic surgery.

Mini screws, similar to mini implants, can also be used to affect direct anchorage and produce amazing results. The buccal plate is perforated using a round bur, and a T-handle used to place these small implants. They are loaded immediately, and can be used to move 6 teeth 'en-masse', plus they are useful for intrusion of incisors in cases where the overjet/overbite relationship is difficult to restore. An example was shown of this.

Dr Celenza then moved on to discuss indirect anchorage, where an implant was placed somewhere outside the dental arch, e.g. midpalatal or retromolar. These implants were custom designed for orthodontists, and were where Dr Celenza felt the real excitement lay. Currently two types were available, the 'Onplant', made by Nobel-Biocare, and the 'Ortho-implant' by Straumann.

The former is a small disc placed subperiosteally but **Dr Celenza** viewed this design less favourably. The latter was a proper endosseous implant of short length, incorporating SLA technology and rough surfacing.

Placement of the 'Ortho-implant' was described as simple. A small core of mid-palatal mucosa was removed between the upper second premolars using a Biopsy punch and either a 4 or 6mm 'ortho-implant' was placed with very high primary stability in dense cortical bone.

These implants generally integrated rapidly and were utilisable as indirect anchors in 8 weeks. A snap-on plastic impression coping was placed and alginate used to take an impression of the implant and the surrounding premolars. A transpalatal bar was constructed, attached to the implant and bonded to the palatal surfaces of either premolars or molars, rendering them as 'absolute anchors'.

**Applications of the mid palatal implant**

**Anterior retraction.** A Class II div 1 example was shown, using a Transpalatal Anchor (TPA), upper premolars were extracted and the entire anterior segment retracted en-masse with no anchorage slip.

**Posterior protraction.** Four upper molars were moved bodily anteriorly using a similar TPA in a bid to close spaces in a 34 year old lady with missing upper second premolars

**Molar distalisation and 'double-driving'.** It is notoriously difficult to distalise molars without causing flaring of the anterior teeth. Using a TPA attached to the premolars, it was possible to distalise molars with zero anchorage slip. In the example shown, the upper first molars were first moved, the TPA was then replaced on these newly positioned molars ('Flip the TPA'), and the premolars were then retracted using the molars as absolute anchors. This technique was eloquently called 'double driving'.

**Mutilated dentitions.** Adobe Morph was used to show beautifully how a lady in her 60s presenting with poor dentition complicated by deep overbite and increased overjet can be orthodontically and subsequently conventionally restored.

**Bimaxillary retraction.** Zero anchorage slippage was again noted using a maxillary TPA attached to the upper sevens, and class III traction to allow the lower arch to be retracted 'en-masse'.

The forces acting on dental implants versus the forces acting on orthodontic implants were then compared. Orthodontic load is very gentle, is continuous and is unidirectional, whereas occlusal load is sudden, of higher magnitude and multi-directional. Orthodontic load, despite what one may think, is really not very challenging to implants. The lecturer, in his experience, had never de-integrated an implant with orthodontic load.

Removal of implants, or explantation, was also described as simple. A screw guide sleeve was attached to the implant following removal of the TPA, and the implant was trephined out, allowing the site to heal. A tiny socket is left, no vital structures are in this mid-palatal area, and complete healing takes place, often under an orthodontic retainer.

**In summary,**

Orthodontists are becoming part of the implant team, (implant dentists are becoming part of the orthodontic team?)

Treatment possibilities are expanding,  
Lack of compliance by the patient is being eliminated,  
Headgear is becoming obsolete,  
Treatment time is being decreased.

Further information was invited by e-mail on [fcelenza@orthoperio.com](mailto:fcelenza@orthoperio.com) or visit [www.frankcelenza.com](http://www.frankcelenza.com)





**SATURDAY 14 MAY**

Session Chairman  
 - **Prof. RICHARD PALMER** - London, UK



**Dr. STEWART HARDING** - Guernsey, UK

**Tapered Implants  
 - The Shape of Things to Come**

Report by Dr Graham Murray

**D**r **Harding** is a founder of the Warwick University Medical School MSc in Implant Dentistry which is now attracting interest from as far afield as Dubai and Singapore. Fifteen years ago **Stewart** was on the first ADI committee to organise the inaugural symposium. There were just 250 members dealing with 2 implant companies who at that time were not really geared up to the needs of regular dentists.

Things have moved on and implants have evolved from basal bone implants supporting overdentures to the tapered rough surface implants in alveolar bone of today.

Typically teeth were extracted, implants placed after six months, allowed to heal and then progressively loaded after six months giving total treatment times of some eighteen months. In the mid-90s people experimented with immediate placement but fixation was difficult in extraction sockets using cylindrical implants.

The restorative demands were for immediate tooth replacement and early loading. Good primary stability would lead to osseointegration and good secondary stability.

Improvements were made to the micro designs of the implant surfaces and the macro designs of the threads. An 'Osteo-Ti' implant with a calcium phosphate surface was given a product licence as a pharmacological device.

A surgical protocol was developed to minimise

drilling in the mandible using self-cutting tapered implants.

Extraction techniques have improved with luxators to preserve the labial plate and flapless surgery is advocated where possible to avoid denuding fragile bone. Tapered implants are ideal for the tight spaces in between tooth roots.

An immediate impression of the fixture head can be taken using the healing cap hence putting no torque on the implant. **Dr Harding** illustrated these techniques with pictures of an implant in his own mouth!

In his experience, immediate substitution even with apical pathology shows no higher failure rates. In certain circumstances immediate temporaries can be placed using press-fit provisional prosthetic components.

**Dr Harding** advocates a transmucosal approach for lower molars placing immediate implants down the root sockets. Site formers can avoid the need for drilling in the maxilla and inter-radicular bone can be used to secure implants in upper premolar and molar sites.

Contra-indications include acute infection and poor primary stability - an **ISQ (Implant Stability Quotient)** of more than 50 is recommended.

Future developments include titanium implants shaped to enhance papilla preservation and formation.



**Dr. BERNARD TOUATI** - Paris, France

**Biologically-Driven Implant Prosthetic Procedures**

**Abstract**

Integration of fixed prosthetic restorations is our main objective psychologically, as well as physically, mechanically and especially biologically. It represents one of the most important criteria of success in implant treatments.

It has been shown that peri-implant structures may be maintained with limited tissue recession due to bone remodelling. Multiple parameters are involved in the latter, which can be associated with inadequately conceived hardware, inappropriate

clinical procedures or poor tissue conditions.

High-strength ceramic abutments and all-ceramic crowns are biocompatible and improve tissue integration, which ultimately requires the respect of multiple biological factors including the understanding of the "biologic space".

At present our approach ought to be preservative and biological, during both surgical and prosthetic stages.



**Dr. PETER SCHUPBACH** - Horgen, Switzerland

**Bone and Soft Tissue Integration with Different Implant Surfaces**

**Report by Dr Eddie Scher**

**P**eter Schupbach says it is well known that the surface texture of bone-anchored implants has direct significance for the healing and subsequent response in the bone tissue.

He opened his presentation by comparing the attachments between the natural tooth and the osseointegrated implant. The former is a very sophisticated structure where Sharpey's fibres connect the cementum to the bone forming part of the junctional epithelium. The latter is a relatively weak structure which relies on cell attachment via a hemi-desmosomal attachment. As this is also meant to be a defence mechanism to prevent bacteria from the mouth (107 bacteria / ml. of saliva.) it is obviously very important to achieve the best possible barrier.

From both his own studies and studies where he collaborated with **Roland Glasier**, **Dr Schupbach** argued that the collagen fibres aligned themselves parallel to the Nobel Biocare Ti-unite® (roughened oxidised titanium) surface and became more func-

tionally orientated. He referred to Glasier's work comparing the Ti-Unite surface when used in humans to the machined surface, and he showed it to be far healthier the machined surface having 30% more inflammatory cells. These findings were illustrated with the most superb electron micrographs.

**Dr Schupbach** also suggested that you should disconnect and connect your abutment as few times as possible. He referred to Abrahamson work published in 2003 suggesting that it is 'OK' to connect and disconnect once.

Our speaker then proceeded to show electro micrographs where there was direct contact between the bone and the Ti-Unite surface. He compared this with other surfaces and showed how much better the contact was compared to a machined surface.

Finally he suggested the ideal would be to have an implant with a post all in one piece, so there would be no need to disturb the soft tissue connection.



## Dr. DONALD P CALLAN - Little Rock, USA

### Esthetic Hard and Soft Tissue Grafting for the General Practitioner

Report by Dr Koray Feran

**D**onald Callan is a periodontist from Arkansas who spoke on the practicalities of bone grafting. From the outset he warned that despite his numerous academic publications, that this would be a mainly clinical presentation and we were not disappointed. He also stated that he had degrees in business management and marketing as well as periodontics and that his practice was now 80% tissue regeneration and 20% periodontally based.

**Regeneration** is the key word, both of hard and soft tissues. He defined the differences between tissue grafting and tissue regeneration. A graft involved a donor tissue that would be incorporated into the recipient site. A regenerative procedure involved the utilisation of the regenerative capacity of the diseased site to regenerate new, functional tissue where it was required.

He demonstrated this by showing a patient with severe periodontal disease necessitating extraction of teeth. A non-biologically active grafting material was used to fill the defects, but **Dr Callan** stated that the resulting tissue was merely a filled space with no biological activity and was not conducive to the placement of implants.

He contrasted this to the cases where true regeneration took place and the resulting tissue volume was that made up of the correct tissue biology which would behave as if were true bone and overlying connective tissue and gingival. This enabled implants to be placed into the desired sites without having to worry about the consistency of the tissues.

Tissue regeneration and tissue grafting are not one and the same thing. **Dr Callan** showed failures of regeneration and stated that there was nothing wrong with this as long as we learnt (and taught other colleagues) from these failures.

**Dr Callan**, from a business and marketing point of view stated that the surgeon had to convince the referring dental surgeon and the patient who in turn had to convince their spouse or partner with children at college that tens of thousands of dollars were required to restore their lost dentitions. It made sense to minimise failures and have a reproducible and defensible, literature based treatment

modality which worked and was easy to market.

Thus, **Dr Callan** touched on each step in his treatment process and how the success of each step was ensured.

As far as marketing was concerned, it was important that what the treating surgeon and what the patient understood by regenerative and implant therapy matched. 203 patients were questioned regarding implant treatment. The patients normally asked how much treatment would cost, whether it would be painful and how long it was likely to take. What they didn't usually ask but presumed was that treatment would result in a 'normal' functional set of teeth that last forever and look natural.

Patients want 'what teeth do'. Success scientifically and success from the patients point of view are not the same. A scientific success or survival is not enough if the patient is not satisfied. **Dr Callan** stated that **such dissatisfied patients never moved away or died but just kept coming back!**

Tissue regeneration is actually what patients expect. They want their lost functional tissue back. **Dr Callan** stated the choice between osteoconductive and osteoinductive materials. True osteoinduction will give biologic success rather than just a radiographic success. Regeneration rather than filler.

Implant and implant based prosthodontic treatment has evolved many forms to compensate for lack of bone. **Dr Callan** asked why we didn't have a more predictable and reliable bone regeneration protocol to make the difficult implant cases easier. He went through the reasons for bone loss in all directions and stated that bone loss should be prevented by guided socket regeneration rather than repair since bone loss always rapidly followed tooth extraction.

**Dr Callan** was wary of the current trend of placing implants directly into sockets since there is no long term follow up of such cases and also that most ideal implant positions do not actually correspond to the positions of the existing extracted teeth. Ideal bone levels are required to allow this to be predictable.

Normal socket and defect repair involves soft tissue fill-in as well as bone - it is normal and soft

tissue will remain invaginated into bone sockets even many years after extraction, not necessarily visible on radiographs. It is necessary to protect any regenerative material in sockets to ensure that epithelium grows across rather than under the graft. Epithelium tends to follow the line of least resistance close to nutrition. Thus, if the graft material is not well protected and infused, the epithelium may grow between it and the bone rather than over it. The graft then becomes encapsulated and non-functional.

'Don't wait until it's too late' is **Dr Callan's** motto to his patients losing teeth. The longer one waits after tooth loss, the more complex and expensive the corrective procedures, if they are possible at all.

**Dr Callan** defended the bad reputation of wide diameter implants - it wasn't the size of the implant but the lack of bone and soft tissue around it. He stated that wide diameter implants performed fine if there were sufficient thicknesses of investing bone and gingivae around them. The usual problem was the utilisation of wide diameter implants in large sockets with thin walls and this is where greater integration and aesthetic failures occurred.

**Dr Callan** admitted the presence of many products on the market for grafting. However, true osteo-inductive materials were rare and were usually human bone products, either autogenous or allografts. Regenerated, living bone has the same success rate as normal bone as far as implant success is concerned. If one can still see a socket outline more than 6 months after grafting a socket, then it is unlikely that there has been true tissue regeneration and there is likely to be some encapsulation.

He stressed that the regenerative potential of bone around previously periodontally infected roots was unpredictable and it was often better to sacrifice periodontally affected teeth in favour of a more predictable bone regenerative environment where teeth were absent.

**Dr Callan** uses Grafton-DFDBA putty. This allows shaping of the graft and true tissue regeneration as proven histologically. Alloderm is used as a natural collagen barrier, which seems to further bone regeneration. This is cadaveric human dermis with the cellular compartment removed to leave the collagen matrix only. His argument that the lack of cellular content ensures that there is no risk of cross infection did not address the potential presence of

viral or prion material in the extra cellular compartment. Alloderm is soaked first in a tetracycline solution to act as an anticollagenase. **Dr Callan** also stated at question time that chlorhexidine is a fibroblast inhibitor and he would advise not to use if there is an open wound required to heal.

Repeated slides showed very convincing radiographic and clinical regeneration and the Alloderm seemed to provide gingival tissue that blended well with the surrounding gingival tissue, unlike the palatal free gingival 'tyre patch' graft whose margins are usually visible. The Alloderm also ensured that large flap elevations and mobilisations were not routinely required to cover the graft. The strip of Alloderm was able to be placed over the Grafton and butted against the gingival tissue edge and sutured providing a wider band of keratinised tissue than previously existed.

**Dr Callan** proved that the basis for this lecture was based on literally hundreds of cases over the last 15 years and that routine bone regeneration was possible in general practice without large surgical procedures always being necessary.

During question time, **Dr Callan** responded to a question about decorticating cortical bone prior to grafting against it. He stated that there was little difference in his experience unless the cortical bone was extremely white and lacked an obvious surface bleed. He now decorticates routinely but has not seen much difference.

He also stated that he preferred DFDBA over autogenous bone not only due to reduced patient morbidity, but also that autogenous bone requires osteoclastic resorption of the graft first prior to osteoblastic activity. He suggested that osteoclastic activity was not required with DFDBA putty since there is no mineralised component to be resorbed prior to the mineralization of new bone matrix. He expanded by saying that all DFDBA is not the same and the minimum amount of mineral must be present in the allograft to reduce necessary osteoclastic activity. He did not specify how the recipient site would integrate with the graft without this osteoclastic activity which must be required to allow fusion of the graft / recipient site interface.

**Dr Callan's** presentation was very encouraging to general practitioners involved in implant dentistry that application of certain basic principles could lead to very predictable bone regeneration results.



## Dr. PATRICK PALACCI - Marseilles, France

### Anterior Soft Tissue Aesthetics: Creation of Papillae

Report by Dr Michael Norton

**T**he flamboyant and delightful Frenchman from Marseille was the inventor of the papilla pedicle flap.

He provided us with a thorough guide through the history of soft tissue management around dental implants. Recognizing that success was not just about osseointegration but was rather 'a puzzle of hard tissue, soft tissue, restorative and aesthetic outcome' all of which was intrinsically dependant on the starting point. For example he questioned the value of excessive soft tissue surgery in the posterior jaws, where aesthetics is not so often an issue.

**Dr Palacci** impressed upon us the need to be able to identify and classify the type of patient and the type of tissue in the patient. Focusing on the anterior maxilla he reminded us of his own Palacci/Ericsson classification:

1. Intact papilla with space for restoration
2. Some vertical papilla loss
3. Vertical papilla loss and additional mid-buccal vertical defect
4. Adjacent tooth loss with vertical defect

In addition a sub classification of horizontal bone loss from A to D would help define the complexity of the case and the complexity of the reconstruction.

For **class 1 cases** the key was nothing more than precision of implant placement and the fabrication of a harmonious aesthetic restoration. **Dr Palacci** prefers the delayed or staged approach for such cases versus the immediate approach since he believed this gives better control of the soft tissues.

For **class 2 cases** the options were for a connective tissue graft versus prosthetically guided tissue enhancement versus the papilla rotation pedicle flap utilizing a beveled incision.

**Dr Palacci** stated that in his view it was always best to use simple abutment designs and he had a strong preference for titanium abutments. He emphasized the need to ensure that when raising flaps a relieving incision is used to ensure tension free closure and mattress sutures. **Dr Palacci** had performed the papilla rotation pedicle flap technique nearly 3000 times and placed around 7000 implants since 1988 and his recommendations

were therefore based upon solid experience and the technique for which he has become internationally renowned.

For **class 3 cases** there was a need to graft the vertical bony defect first. His preference was to use a cortico-cancellous block harvested from the chin, followed by a 3 to 4 month healing phase. This he said would convert a class 3 to a class 1 case where soft tissues were released and advanced coronally. At that point good implant positioning and an aesthetic restoration would do the rest.

Again **Dr Palacci** emphasized his preference for the staged approach, opting to submerge the implant when undertaking any grafting or papilla reconstruction. In this respect he was not afraid to undertake full flap reflection and countersinking of the implant to ensure an optimal implant head position for a good aesthetic result.

Finally for **class 4 cases** it was a sequential process of converting it from class 4 to class 2 and then to class 1 by using a series of hard and soft tissue grafts with a staged approach allowing adequate time for healing. His overall view was to keep it simple and that went for both the surgical techniques and the components used.

In summary **Dr Palacci** identified 5 phases to the reconstruction of the crestal soft tissues aided by hard tissue grafting, implant positioning and the ceramic restoration, these were:

- Labial soft tissue support
- Papilla support
- Scalloped shape
- Emergence profile
- Colour and texture of the soft tissues

He showed some beautiful examples of each class and demonstrated his techniques with enthusiasm and passion.

It was clear that by placing **Dr Palacci**, whose name has become synonymous with papilla reconstruction, last on the conference podium we had ensured that the maximum number of delegates stayed to the not-so-bitter end!