implants
the journal of oral implantology

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| case report |
Laser-assisted treatment

| clinical |
Implant-retained crowns

| business |
Marketing your practice
Switch on to new ideas

Speakers:
- Prof Nasser Barghi
- Dr Richard Kahan
- Prof Gianluca Gambarini
- Dr Wyman Chan
- Dr John Moore
- Dr Ajay Kakar
- Dr Sandeep Senghera
- Dr Nilesh Parmar
- Dr Basil Mizrahi
- Prof Fraser McCord
- Dr Amit Patel
- Dr Anthony Roberts
- Ms Mhari Coxon

18th and 19th May 2012
Millennium Gloucester Hotel & Conference Centre, London Kensington
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EARLY BOOKING DISCOUNT
Dear Reader,

Welcome to this issue of *Implants*. I hope you find it an enjoyable and informative read.

In this issue we have something for everyone! Of particular interest is the article by Drs Topete, where they discuss the use of multiple implants for the replacement of each tooth root.

In addition, Nilesh Parmar has submitted an article highlighting the usefulness that Cone Beam Computed Tomography (CBCT) in treatment planning and execution.

Looking at the business side of running an implant practice, the profession’s most influential practitioner for 2012, Dr James Goolnik, writes about successfully marketing your practice.

Dr Philip Friel looks at the delicate balance between form and function when placing implants in the aesthetic zone; in this instance discussing the technique of immediate loading.

Remember we are here for you, the reader. If there is something you would like to see or if you have an article you would like to contribute, please get in touch – I’d love to hear from you.

Until next time...

Lisa Townshend

Group Editor
*Implants*
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*Cover story: This month’s image can be found in the article 44 Roots - 44 Implants by Drs Topete*
Discover Atlantis™ crown abutment

Atlantis™ crown abutment is an efficient, effective and aesthetic alternative to traditional cast abutments for single-tooth, screw-retained restorations.

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Atlantis crown abutment is available in five shades, including a new translucent zirconia in white. It can be placed in all positions in the mouth and is covered by a comprehensive warranty.

For more on the benefits of Atlantis™ screw- and cement-retained solutions, visit www.astratechdental.co.uk.

Experience the freedom of unlimited possibilities. Experience Atlantis™.
ADl implant courses for dental nurses

Due to the resounding success following the launch of the ADI Dental Nurses’ Course last year, the ADI is continuing the Original Dental Nurses’ Course for 2012 and has created an Advanced Dental Nurses’ Course.

The Original One-Day Course on Dental Implants for Dental Nurses aims to increase the understanding of dental implantology to dental nurses. The course caters for the inexperienced dental nurse, offering nurses the knowledge and confidence to support the operator with surgical implant placement and subsequent restorative appointments.

The Advanced One-Day Course entitled ‘Surgical Dental Implant Procedures for Dental Nurses’ has been created for dental nurses who are experienced in assisting with implant placement or have completed the Original One-Day Course.

The course aims to examine the dental nurses’ role in assisting with advanced surgical procedures in implant dentistry. Upon completion, nurses will recognise the instruments required, the process and the indications for each of the procedures.

The courses are located in London and Edinburgh. Both courses are booking up fast, with the first 2012 London date for the Original Nurses’ Course already full. For more information visit www.adi.org.uk or call the ADI on 020 8487 5555.

Nobel Biocare has launched www.allon4-dentist.co.uk, a new consumer website to encourage patients to contact authorised All-on-4 dentists for life-changing treatment.

All-on-4 is a revolutionary solution for edentulous patients, who receive an aesthetic, fully functioning, fixed full arch prosthesis in a single day, using only four implants.

www.allon4-dentist.co.uk is designed for intuitive and easy navigation, directing patients towards their nearest qualified All-on-4 dentist with a ‘postcode finder’. So far, more than 40 practices from all over the UK are on the site, listed by geographic location. Patients can view the practice’s profile information, contact telephone number, address and website.

The site clearly explains the process of All-on-4 in layman’s terms and reassures patients with ‘before and after’ images and video testimonials. They are also reminded of the benefits that fixed teeth bring to their health, confidence and lifestyle.

Dentists who wish to be added to the website must be certified by Nobel Biocare as Centres of Excellence for the All-on-4 procedure. This involves specific training and surgical experience and use of the scientifically proven products from Nobel Biocare.

For further information, or to be added to the site, please contact Nobel Biocare on 0208 756 3300 or visit www.nobel-biocare.com.

BioHorizons, a dental implant company, has announced a new mobile application allowing Apple iPad mobile digital device users access to the latest BioHorizons product information. The free app is designed to conveniently provide dental clinicians with relevant videos and literature in a single location.

“We are proud to introduce an iPad application developed to provide up-to-date, relevant information about our products,” said Todd Strong, Chief Operating Officer of BioHorizons.

With the new app, dental professionals have the ability to easily share educational materials with their patients. Users can also reference surgical manuals and technique guides for the many BioHorizons implant systems.

“Our new app gives dental professionals quick, accessible information for placing and restoring BioHorizons implants on the most widely accepted digital platform. We continue to provide our customers advanced technologies that help them to excel in their practice,” Strong said.

BioHorizons literature and videos are optimised for the iPad and conveniently available offline. Automatic updates occur anytime a Wi-Fi connection is available.

This user-friendly app is free and filled with features. It can be downloaded from a link on the BioHorizons website www.biohorizons.com or on the iTunes store.
The only control system offering the pre-programmed clinical sequences of the main implant brands is now available with a dedicated application for touchscreen tablets.

Discover the perfect working balance between your iPad* and exceptional electronics for controlling the MX-i LED micromotor. The most powerful motor on the market, with LED lighting guaranteeing a very long service life, is now also equipped with ceramic ball bearings that are lubricated for life.

The 20:1 L Micro-Series contra-angle and the new iChiropro system redefine ergonomics and ease of use.

* Compatible with iPad and iPad 2
Study hints at why gums suffer with age

New research from Queen Mary, University of London in collaboration with research groups in the USA sheds light on why gum disease can become more common with old age.

The study, published in *Nature Immunology*, reveals that the deterioration in gum health which often occurs with increasing age is associated with a drop in the level of a chemical called Del-1.

The researchers say that understanding more about Del-1 and its effects on the body’s immune system could help in the treatment or prevention of serious gum disease.

Periodontitis is a disease of the gums which causes bleeding and bone loss which can, over time, lead to loss of teeth. It affects about 20 per cent of the UK population and is caused by an over-active immune response to bacteria that grow in the mouth.

As people age they are more likely to suffer from inflammatory diseases, including gum disease.

The new research investigated gum disease in young and old mice and found that an increase in gum disease in the older animals was accompanied by a drop in the level of Del-1. This protein is known to restrain the immune system by stopping white blood cells from sticking to and attacking mouth tissue.

Mice that had no Del-1 developed severe gum disease and elevated bone loss and researchers found unusually high levels of white blood cells in the gum tissue.

When they treated the gums of the mice with Del-1, the number of white blood cells dropped, and gum disease and bone loss were reduced.

The researchers say their findings could be the basis for a new treatment or prevention of gum disease.

Mike Curtis is Professor of Microbiology at Queen Mary, University of London, Director of the Blizard Institute and the lead on the microbiological studies in the research. He said: “Periodontitis is an extremely common problem and we know that the disease tends to be more common as we get older.

“This research sheds some light on why ageing makes us more susceptible and understanding this mechanism is the first step to an effective treatment.”

Dental Laboratories Launch ‘The British Bite Mark’

NHS & Private dental patients in the UK who are about to have a new crown, implant, denture or veneer fitted are now being offered the opportunity to find out where their appliances have been made, following the launch of the ‘British Bite Mark’ by the Dental Laboratories Association.

In recent months there have been a significant number of dentists looking to send their prescriptions to dental laboratories in the Far East to help reduce their overheads, rather than using the traditional route of dental laboratories based in the UK.

The Dental Laboratories Association appreciate that the different levels of regulation and professional requirements can be confusing and difficult for patients to understand and therefore have looked to design a logo that at a quick glance will help inform the patient that their dental appliance has been manufactured in the UK and meets the UK regulatory requirements.

At the launch of the British Bite Mark campaign, Richard Daniels, Chief Executive of the Dental Laboratories Association said: “I believe that by introducing the British Bite Mark, we are helping patients instantly recognise where their appliance has been manufactured and that it complies with UK regulations, with the ultimate aim of ensuring patients receive a transparent service from their dentist.”

Over the coming months, the British Bite Mark will feature strongly in local and national media, as well as in all the major social networking sites. The Dental Laboratories Association will also be issuing information to health centres, Libraries and dental practices to help educate the patient about the difference between appliances manufactured in the UK and overseas.
The use of Er:YAG in laser-assisted broken abutment screw treatment

Author_Avi Reyhanian

Abstract

Dental implants are a functional and aesthetic solution to partial and total edentulism. Although the overall success rate of implant dentistry is very high, more than 90 per cent of the treatment modality is not free of complications and dental implants occasionally fail.

The chronic loosening or fracturing of implant screws continues to be a problem in restorative practices and generally are challenging to remove. This report describes and demonstrates the management and technique used for the removal of fractured screw fragments and the successful utilisation of the Er:YAG laser as an important auxiliary tool.

Introduction—the problem

Success in implant-supported prosthetic replacement of teeth will be due to a combination of appropriate placement criteria (receptor site quality, implant stability, osseo-induction), appropriate (non-excessive) loading and prevention of bacterial contamination.

The failure of dental implants is due not only to biological factors, such as unsuccessful osseo-integration or the development of peri-implantitis, but it may also result from technical complications.1,2 Dental implant complications may be considered under the following main categories:

Early

- Failure/inadequate surgical preparation
- Failure of osseo-integration
- Peri-surgical infection

Late

- Implant overloading, leading to bone loss
- Peri-implantitis
- Soft tissue complications
- Fracture of mechanical components and aesthetic/phonetic considerations

Failures of implant-supported restorations result from technical problems and can be divided into two groups: those relating to implant components, and those relating to the prosthesis.3,4,5,6,7,8,9,10,11 Technical problems related to implant components include abutment screw fracture.6,12
The abutment screw fracture presents a rare, but quite unpleasant failure and can be a serious problem, as the fragment remaining inside the implant may prevent the implant from functioning efficiently as an anchor. The primary reason for screw fracture is undetected screw loosening which can be due to bruxism, an unfavourable superstructure, overloading or malfunction. Fractures of the implant abutment or of the abutment screw have been observed as a consequence of screw loosening and undetected micro-movements of the abutment under functional loading and consequently, it is advised that the repeated loosening of an abutment screw should alert the clinician to possible significant contributing causes.

However, the behavior of the implant/abutment joint components with respect to critical bending force is still unclear. Studies show that implant abutment failure occurs when lateral forces exceed 370 Newtons for abutment with a joint depth of at least 2.1mm and 530 Newtons with a joint depth of at least 5.5mm.

Preventive recommendations

The number, position, dimension and design of implants, as well as the design of the prosthesis are critical factors to be considered during the treatment planning phase. To withstand high bending stresses, implants should be as long and as wide as possible, used in adequate numbers, and be positioned such as to allow axial loading. Implant components are known to fracture more frequently in the posterior region and in partially dentate patients compared to completely edentulous patients.

Retightening an abutment screw ten minutes after the initial torque applications should be routinely performed, and increasing the torque value for abutment screws above 30 Newtons can be beneficial for the abutment, implant stability and to decrease the possibility of the screw becoming loose.

Proper case selection, excellent surgical technique, placing an adequate restoration on the implant, educating the implant patient as to the importance of maintaining meticulous oral hygiene, and evaluating the implant both clinically and radiographically at frequent recall visits; reinforcing periodic maintenance.

A procedure for using dimples inside the abutment screw cylinder above the screw, and filling the holes with elastomeric impression material will prevent the screw-retained prosthesis from loosening.

- Using the correct fixation screw
- Replacing loose screws instead of retightening them
- Immediate investigation; looseness of the prosthesis is detected by the clinician or patient.

Fragment retrieval methodology

The methods employed to grasp the broken fragments or screw are determined according to the location of the fracture abutment—above or below the head of the implant. If an abutment screw fractures...
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I case report

Er:YAG lasers

above the head of the implant, an explorer, a straight probe or haemostats might be successful. The tip of the instrument is moved carefully in a counter-clockwise direction over the surface of the screw segment until it loosens. If the screw fracture occurs below the head of the implant, other methods are required. There are several available implant repair kits:

- ITI® Dental Implant System (Institut Straumann AG, Switzerland), consists of drills, two drill guides and six manual tapping instruments.
- IMZ® TwinPlus Implant System (DENTSPLY Friadent, Germany)
- Screw Removal Kit Replace (Nobel Biocare™, Yorba Linda, California, USA)
- Certain®-Screw Removal Kit (Biomet 3i™, Florida, USA)

The application of these systems is to permit a hole to be drilled into the centre of the broken screw and drive a removal wedge into the hole that engages the broken screw when reverse torque is applied by removing the instrument.

If no thread damage has occurred and the screw has not “bottomed out” or torqued into a seating stop, then the force necessary to remove the screw may be minimal. If none of these systems is available, another method for broken screw retrieval involves the following procedure: after the prosthesis or abutment is removed, the screw hole is vigorously flushed with an air/water spray from a 3-way syringe. Pressurised air is applied to dry the screw hole, and a drop of mineral oil (delivered on the tip of an explorer) is introduced into the screw hole. A sharp 1/4-round bur in a high-speed handpiece is activated and lightly applied to the exposed side of the fractured screw. The objective is to have the spinning bur’s blades contact the metal surface of the screw so that the screw will spin itself out of the hole. When repeated several times, the screw can be backed out and retrieved easily with forceps.

If this technique fails, a slot can be created using a surgical drill, on the head of the fractured screw, and then a screwdriver is used to back out the broken abutment screw. Sometimes just a gentle touch with the drill to the head of the broken screw will be enough to back it out. If the hexagonal head of the screw is stripped, it should be filed away completely using a round carbide bur or heatless stone, the head of the implant should be straightened, and a new abutment may be rotated into the implant.

Case study

This clinical report describes a situation in which a fractured implant abutment screw was successfully retrieved by using the Er:YAG laser as an auxiliary tool, and the advantages of this 2,940nm wavelength versus conventional methods.

Examination

A 36-year-old male presented for treatment, reporting the detachment of an implant-supported crown in the region of the upper left central incisor. The patient stated that the implant and crown had
been placed four years earlier and that looseness of the crown had occurred on two occasions during this period. On both occasions, the screw had been retightened with no further investigation.

Clinical examination of the patient revealed a missing tooth at the location of #9 with no sign of an implant (Fig 1). The patient brought the abutment, crown and broken screw with him (Fig 3). Radiographic examination of the area showed the presence of a root-form cylindrical implant, consistent in appearance with a 13mm long, 3.75mm diameter abutment with an internal hex. The apical part of the screw remained threaded into the implant, but had fractured at the level of the hexagonal lock. Although the implant was osseointegrated, there were radiographic signs of peri-implantitis with some crestal bone loss having occurred (Fig 2).

**Treatment options**

The treatment options available were: 1) retrieve the fractured screw, or 2) remove the old implant and insert a new implant in one sitting. Following discussion with the patient and evaluation of the possibilities for success, it was decided to try and retrieve the fractured screw. Treatment would involve the use of the Er:YAG laser to perform the following, based upon accepted research:

- The flap incision
- Ablation of granulation tissue around the implant
- Remodelling, shaping and ablating of the bone
- Detoxification of the infected surfaces of the implant
- An associated osteogenic (GBR) procedure to prevent soft tissue in-growth and maintain the form of the alveolus

**Treatment**

A dual-wave laser system with operating wave-lengths of 2,940nm and 10,600nm (OpusDuo™ AquaL-ite®, Lumenis, Ltd. Yokneam, Israel) was employed for this procedure. The laser operating parameters employed for the various surgical stages were as follows:

- **Flap Access:** Wavelength: 2,940nm (Er:YAG), 200-micron sapphire tip, in contact mode; 450 mJ per pulse at 20 Hz. Total power: nine Watts
- **Granulation Tissue Removal:** Wavelength: 2,940nm (Er:YAG), 1,300-micron sapphire tip, in non-contact mode; 700mJ per pulse at 12Hz. Total power: 8.4 Watts
- **Bone Surgery:** Wavelength: 2,940nm (Er:YAG), 1,300-micron sapphire tip, in non-contact mode; 450mJ per pulse at 20Hz. Total power: nine Watts
- **Detoxification of the implant:** Wavelength: 2,940nm (Er:YAG), 1,300-micron sapphire tip, in non-contact mode; 150mJ per pulse at 20Hz. Total power: three Watts
- **Decortication for GBR technique:** Wavelength: 2,940nm (Er:YAG), 1,300-micron sapphire tip, in non-contact mode; 500mJ per pulse at 17Hz. Total power: 8.5 Watts

A “V” shape incision was made with the Er:YAG laser. An intrasulcular incision was made (after anaesthesia) at the buccal and palatal side of the implant, together with two vertical relieving incisions: one at the mesial side of tooth #8 and the second at the mesial side of tooth #11 (Figs 4 and 5).

The buccal and palatal flaps were lifted and the area explored (Fig 6); there was granulation tissue around the neck of the implant. The granulation tissue was ablated using the laser (Fig 9). Vaporisation of granulation tissue (if any exists) after raising a flap is efficient with the Er:YAG laser, offering a lower risk of overheating the bone than that posed by the current diode or CO2 lasers. And often obviates the need for hand instruments. Results from both controlled clinical and basic studies have pointed to the high potential of the Er:YAG laser and its excellent ability to effectively ablate soft tissue without producing major thermal sideeffects to adjacent tissue has been demonstrated in numerous studies.
The broken hexagon slot was straightened, using a round diamond bur and the head of the implant was rendered smooth. A slot was created with a surgical drill on the head of the fractured screw, and a screwdriver was successfully used to unscrew the broken abutment screw (Figs 7 and 8). The Er:YAG laser was aimed at the surface of the exposed implant for the purpose of decontaminating the infected exposed surfaces, without damaging them. Studies have shown that Er:YAG laser energy effects on bone include bacterial reduction. Following this, all accessible bone surfaces were exposed to laser energy to ablate necrotic bone and to shape and remodel the surface, in accordance with established clinical protocols. Decortication of the buccal bone was then performed (Fig 10). The purpose of decortication is to encourage bleeding, providing progenitor cells to the site. A new abutment was then inserted into the implant (Fig 11). All spaces between implant and existing osteotomy site were filled with a xenograft bone substitute (Bio-Oss®, Geistlich Biomaterials) and covered with an absorbent bilayer membrane (Bio-Gide®, Geistlich Biomaterials), (Figs 12 and 13). The mucoperiosteal flap was re-positioned and sutured with silk 3-0, paying particular attention to primary closure of the flap (Fig 14).

Post-operative instructions

The patient was prescribed Clindamycin 150mg x 50 tabs to avoid infection. He was also given Motrin 800mg x 15 tabs for pain. Instructions were given to rinse with Chlorhexidine 0.2 per cent, starting the next day for two weeks x three per day.

Management of complications and follow-up care

The following day the patient reported moderate pain and moderate swelling. There was no tissue bleeding and the site was closed. The flap was showing signs of attachment and was healing nicely. At ten days postop the patient returned for inspection and removal of sutures. The swelling had resolved, there were no signs of fistula and healing was progressing well. After five months the soft tissue was completely healed without complications (Figs 16 and 17). The soft issue had healed over the bone and there were no bony projections observed under the soft tissue. The prognosis is excellent.

Conclusion

The use of osseo-integrated implant-supported prostheses in the replacement of missing natural teeth has become an accepted clinical protocol in dentistry. Success in this area is enhanced through correct diagnosis, treatment planning and maintenance; however, complications often occur, which may be significant and compromise the long-term success of the implant abutment and associated prosthesis. The management of such complications has given rise to several techniques to address failings, such as component fracture and bacterial contamination.

The Er:YAG (2,940nm) laser can be employed as an auxiliary tool for the purpose of decontamination of infected implant surfaces and it has been shown to be effective and safe. The use of the 2,940nm wavelength for these procedures presents many advantages vs conventional methods, including enhancing the surgical site and less bleeding during the operation, providing the practitioner a better field of visibility and reducing patient discomfort during its use. In addition, anecdotal claims have been made that post-operative effects such as pain and swelling are less pronounced.

A summary of possible serious complications associated with implant placement has been given, together with a report of a clinical case in which the use of the Er:YAG laser has been shown to be beneficial in the management of the consequences of a fractured abutment screw.

Editorial note: The literature list can be requested from the Editorial Office.

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Introducing the Laser-Lok® 3.0 implant

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2. Implant strength & fatigue testing done in accordance with ISO standard 14801.
Various surgical techniques for bone augmentation of the maxilla and mandible are mentioned in the literature. This article offers viable alternatives to maxillary and mandibular surgery, helping to prevent implant resorption in molar areas.

Back to roots: “Implantology 2000”

The implantology profession agrees that a greater number of implants to support the prosthesis is a determining factor of success. A greater number of implants decreases the number of pontics, improves the biomechanics by reducing strain on the prosthesis and dissipates stresses more effectively to the bone structure, especially at the crestal level. The maximum osseous surface area and adequate bone density are requirements for long-term resistance to occlusal loads. In addition, the greatest functional surface area is required in the crestal 5mm of the implant body. Comparisons between natural tooth roots and implants show that increasing the surface area by increasing the number of implants is a prime requirement for achieving long-term success of dental implants.

In the past, the replacement of one molar with a single implant was widely accepted as the recommended standard practice. As an innovative and viable alternative to the current standard practice, replacing mandibular molars with two implants and maxillary molars with three implants has been successfully applied since 1994, in other words one implant per root lost. This technique of using multiple implants preserves the natural crown-root ratio of molars. More importantly, multiple implants reduce and balance the occlusal forces. This reduction in occlusal forces greatly reduces implant-bone stress on the surface contact areas in the posterior regions of the mouth where the maximum stress is placed on the molars.

In the 1980s, force reduction and surface area were difficult to balance in the posterior regions of the mouth. Studies clearly demonstrate that the forces are often 300 per cent greater in the posterior areas compared with the anterior regions of the mouth. Bone densities and strengths are 50 to 200 per cent weaker in the posterior regions of the mouth. Yet, implants with a greater surface area (according to length) were inserted in the anterior regions. Natural teeth do not have longer roots in the posterior regions of the mouth, where stresses are greater. Instead, increased surface area is achieved with a greater number of implants, placing two implants in each lost molar. In available bone of adequate width, replacing the lost roots with the same number of implants is recommended, placed in the same position and direction that nature created (within anatomic limitations), especially in cases in which only a few millimetres of bone remain between the cortical floor of the sinus and the crest of the ridge.

This way, the distribution of the bite forces in key points proposed by Misch in his paper at the World Congress of Oral Implantology in Taipei in 2006 could be achieved using thin implants inserted in strategic positions, passing along the sides of the walls of the sinus to create a tripod to support the maxillary mo-
Iars and along the sides of the dental nerve to form the bipod that mandibular molars need to support the occlusal forces. This could be achieved without transplanting osseous blocks from different parts of the body, which makes it a less invasive implantology. The disadvantages of sinus elevation, taking osseous blocks from different parts of the body and nerve repositioning are well known.

Disadvantages of sinus elevation
1. Extended trauma of soft and hard tissues
2. Operation lasts considerably longer
3. Surgery exposes the wound to a higher risk of bacterial and viral contamination
4. Expanded post-operative swelling and high levels of pain are inevitable with the risk of post-operative complaints
5. Sometimes only 3 to 4mm can be gained in order to avoid creating large pointed loads on the sinus membrane
6. The following may occur during or after the operation:
   a) Soft-tissue complications
   b) Rupture of the Schneiderian membrane
   c) Contamination
   d) Fistula
   e) Cavity
   f) Infection
   g) Soreness
   h) Lost of bone and resorption of the graft material (resorption of more than 2mm in two years)
      i) Peri-implantitis
      j) Bleeding
      k) Exuding of pus
      l) Future loss of implants.

Disadvantages of taking osseous blocks from different parts of the body
1. Insensibility of the dental lower nerve when blocks of mandible have been cut
2. Mandibular fractures
3. Numbness of the anterior or posterior mandibular teeth when blocks are taken from the chin or the area of the mandibular branch
4. Exposure of the blocks and fixation screws owing to insufficient soft tissue to close the incision completely
5. Soft- and hard-tissue complications
6. Inflammation
7. Bleeding
8. Exuding of pus
9. Infections that may cause loss of the blocks.

Disadvantages of nerve repositioning
1. Extended trauma
2. Operation lasts considerably longer

However, using CT, virtual models and guides could be created to insert implants in the places in which there is good bone quality and no nerves, arteries, sinuses or nose fossae are affected. This operation of inserting implants without soft-tissue reflection is minimally invasive and is usually of shorter duration. In addition, the danger of contamination and post-operative complaints are less likely, the healing and osseointegration times are shorter, inflammation and pain are minimal and, frequently, the patient reports no pain at all.

The distribution of chew forces using individual implants and one implant per root lost eliminates a united rehabilitation, and also avoid the cantilever that causes the resorption of the mesial and distal walls of the implants, owing to the leverage forces applied by the cantilever. Misch mentioned that with a greater number of implants, resorption, bone loss and the consequent loss of the implants can be avoided. In addition, Perel mentioned that poor

![Fig 4. I.P.S.P.S. diagram for implants of 3.10, 2.75 and 2.50 mm in diameter.](image)

![Fig 5. Case of 27 crowns on 27 individual implants (1991).](image)

![Fig 6. Case of 40 implants in a 58-year-old male patient (2001).](image)
planning of a case will lead to failure. In his conference paper, “Plan it or lose it”, he recounted that any case must entail planning for adequate function in the future and must have a minimum of five years of good function to be considered a success. If we insert the maximum number of implants while planning the position and alignment that the roots used to have perfectly, we can avoid future resorption and most importantly, pain, inflammation, stress and the time that sinus elevation surgery takes, as well as the placement of autogenic bone blocks or the repositioning of the dental nerve.

Since 1994, the following protocol has been in use: the three roots of a maxillary molar are replaced with three implants placed in the locations of the mesial, distal and palatal roots. This allows an increased surface area in a region in which an increased number of implants is particularly important, owing to compromised strength and high occlusal loads.

The maxillary molar sustains masticatory forces of 44kg; therefore, it is recommended that it be replaced with three implants rather than one or two short implants. These three implants act as a tripod to sustain the pressure and forces generated in the posterior region. When a sinus graft is not part of the treatment plan, a sinus lift may be performed from inside the implant osteotomy. This area has very poor bone quality (D4) and deficiency adversely affects the surgical, as well as the prosthetic prognosis. The surgical, as well as the prosthetic protocol, since their insertion is faster regardless of whether the angle is 0, 16 or 26°, as is the case using One-Stage Implants.

Histological studies carried out at Louisiana State University by Block and Meffert have demonstrated the principle of controlled functional osteo-compression. Within three months, single-piece implants immediately exposed to loads showed more than twice the bone density on the implant interface than two-piece implants (implant plus post) without immediate load exposure. Currently, single-piece implants with built-in posts substantially improve the surgical and prosthetic parts, but the insertion of single-piece implants with osteo-compression will undoubtedly improve the surgical, as well as the prosthetic prognosis. The bone-compression technique especially improves bone quality at the implant location. Special instruments devised for this procedure ensure that the implants are inserted into the posterior maxillary without elevation of the cavity, since the insertion of implants in the posterior maxillary quadrant is generally recognised as a challenge, even to the most experienced implantologist. This area has very poor bone quality (D4) and deficiency adversely affects the possibility of inserting sufficiently stable implants in this area. In the presence of deficient alveolus crests, osteo-compression and artificial bone implants are recommended by Palti and Steigmann.

If we use the “implants without surgery” tech-
nique developed in 1997, the general anaesthesia, the anxiety and, most importantly, the traumatic surgery can all be avoided, achieving a shorter healing time and osseointegration. There is no inflammation and no pain during or after the procedure.9

Clinical case report

In 1991 for the first time, a total oral rehabilitation was performed, with 27 crowns on 27 implants in a 51-year-old male patient. Each crown was individually inserted, and the crowns were neither physically nor chemically bonded to one another.8

The clinical goal was to follow the example set by nature and copy the original human dentition as closely as possible by setting individual crowns on implants.7 A physiological prophylaxis of the alveolar bone structure was made, replacing each tooth lost with one implant, through the radicular insertion of intra-osseous implants.7 Nature did not provide us with bridge prostheses but with individual pieces, each having to achieve optimum mastication function. The patient was clinically evaluated daily for one week following the insertion of the implants and the provisional prosthesis. Similar clinical evaluation was continued following the placement of the permanent crowns for the first year to observe the ongoing osseointegration process. Thereafter, the patient was checked in three-month intervals for three years after the procedure. After three years, however, resorption of bone surrounding the maxillary and mandibular molars was observed, and especially so around the maxillary. On the other hand, no resorption was observed around the front teeth. These clinical observations made in 1994 motivated clinicians to seek a solution that would more closely imitate the shape, direction, size, and number of roots that evolution provided for us. The goal was to recreate, as faithfully as possible, a copy of the natural masticatory apparatus with all its unique root structural configurations, whether unipod, bipod or tripod in nature.

The idea immediately arose of replacing lost pieces and their individual roots according to one implant per root lost by using the same alveolus that nature had created for this purpose. This procedure was developed further, resulting ultimately in the collocation of implants without soft-tissue reflection. This technique is termed “implants without surgery” (without soft-tissue reflection) and was presented for the first time at an international congress in 1997.9

Based on the extensive professional experience obtained since 1974, the recreation of the more natural alveoli for every one of the 40 roots that nature provided for our dentition is recommended. (Neither the third molars and the two separate roots of the maxillary first bicuspids nor the two fused roots of the maxillary second bicuspids were considered.)

The case pictured here was completed in May 2000 and was closely monitored thorough check-ups that included orthopantomograms, digital X-rays and CT scans every three months. No apparent resorption was observed in this 58-year-old male patient. He continued to show no periodontal complications, nor any complications associated with his implants. He was instructed on the importance of maintaining daily dental hygiene, including flushing and cleaning of the areas of contact between the implants, gum and crowns with a pressurised water spray, vibrating brushes and vibrating point devices in order to avoid bacterial plaque build-up. It is well known, however, that this principle and ideal technique of one implant per root lost cannot be implemented with all patients. In addition to the great care that patients have to observe in hygienic terms (as we all do), the patient must have sufficient height and width of the maxillary or mandibular bone selected for the insertions. It is also very important to have experience in achieving
case report  multiple implants

Recently, all the roots that made up a human dentition were replaced, one by one. In this case of a 57-year-old male patient, 44 implants were inserted (including maxillary bicuspids with two implants). The goal of recreating all the roots equally within the entire masticatory system was achieved on 11 March 2005. In March 2006, 44 implants were inserted in a 55-year-old female patient, including thin implants passing along the sides of the wall of the left sinus, according to one implant per root lost.

_Materials and method_

As maxillary molars are exposed to a high level of stress (masticatory forces of approximately 44 kg), it is recommended that lost roots be replaced with three implants rather than one or two short ones. The three implants will then act as a tripod and resist the forces and pressure generated in the upper posterior regions of the mouth. The length used for mesial and distal implants is usually 8, 10, 12mm or, if possible, a longer implant. The palatal implant can be somewhat longer, since it is replacing the palatal root of a maxillary molar, which is the longest.

Mandibular molars support chewing forces of approximately 22 to 28kg. The first one has two roots separated in the apex. This can be replaced with two implants of 3.26mm in diameter. The second one with two fused roots ending in one at the apex can be replaced with two implants of 3.26 mm in diameter. These implants will give the bicuspids the balance of vestibular and palatal roots.

Maxillary and mandibular incisors receive masticatory forces of about 15 to 16kg. Since they naturally have only one root, a single implant of the same length as the extracted root is sufficient. When possible, a larger implant may be used (within anatomic limitations).

_Consideration_

It is recommended that in the bone of the posterior or quadrants clinicians use two or three implants according to “one implant per root lost in molars” with an osseous quality of D4 to create a greater predictability of treatment outcome. When pieces are substituted with individual crowns over the implants on maxillary and mandibular molars, a greater positive outcome can be predicted. Alternatively, by using the implants without surgery technique (without soft-tissue reflection) developed in 1997, in combination with the technique of osteo-compression for the insertion of one-piece implants, any need for additional appointments to attend to the possible complications of prosthetic components may be negated. The use of these effective, cost- and time-saving techniques will ultimately save the patient unnecessary anguish, fear, stress, or even the possibility of complicated and traumatic surgery. This technique ensures the possibility of replacing all the 44 roots, one by one, with implants that conform a natural human dentition.

The techniques mentioned also have the advantage of avoiding pain and inflammation both during and after the procedure, which allows for a more rapid healing and osseointegration of the implants. Most importantly, these techniques allow reposition and immediate load (with provisional acrylic or polycarbonate crowns) of each lost piece quickly, simply, effectively, economically and with aesthetic concerns in mind. Also, these techniques are less invasive and more affordable; so, they can be considered viable alternatives to extensive augmentation procedures.

Note: A list of references is available from the author.

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* The Dental Advisor, Vol. 23, No. 3, p 2-5
Immediate implant placement and temporisation in the aesthetic zone

Author_ Dr Philip J Friel

The success of dental restorations can be measured in terms of biological stability over time. With regards to dental implantology, the challenge is no longer one of integration, more long term aesthetic stability of the final restoration.

Nowhere is this biological and aesthetic stability more important than in the aesthetic zone.

Teeth and their roots have a supportive role to the alveolar bone in which they are retained. This bone in turn gives support to the gingival tissue overlying it, and the level of this bone directly affects the position of this gingival tissue. Following tooth loss, this support is lost, and both the hard and soft tissue begin a process of remodelling.

This process invariably results in the loss of bone, and an alteration in the gingival position. While it is possible to replace this support with the use of bone grafting or collagen plug techniques, this can involve a number of surgical procedures in order to achieve the final result.

Original protocols in implantology required that implants be placed into healed edentulous ridges. Implants can, however, be placed at the time of tooth extraction. Such techniques can be used with simultaneous augmentation to preserve ridge width, decreasing total treatment time. This paper and its case presentation, outline a technique which allows, in the right conditions, the replacement of the support of a lost root, and consequently prevents major bone remodelling and subsequent alteration of soft tissue position. The following case is one of many completed, ranging from the single tooth to multiple units, all of which have a minimum of 12 months follow-up, and the results of which will be collectively published in the near future. The illustrated case involves a 63-year-old, retired female patient who was referred to the clinic timeously by her general dental practitioner following root fracture affecting the upper left lateral incisor. Her chief complaint was one of poor aesthetics affecting this tooth (Fig 1).

The condition of this tooth had declined gradually, following placement of a composite crown three years previously. The composite crown had been placed, retained by a temporary post, following failed root canal therapy during which an endodontic instrument was fractured in the tooth (Fig 2).

The patient was in good health, a regular dental attendee with an adequate oral hygiene regime. A full dental assessment was undertaken to include assessment of immediate implant placement and temporisation in the aesthetic zone soft and hard tissue, remaining dentition, occlusion and parafunction, cur-
rent and required oral hygiene and maintenance. The patient was noted to have a high smile line, clearly showing the dentogingival complex in function. A full discussion outlined the options available to the patient, who after consideration, elected a fixed option, with implant restoration being her solution of choice. The patient was fully aware of the risks and alternatives to the procedure, and given her very recent root fracture affecting the tooth, surgery was scheduled for the same week.

Mounted study models were produced, upon which, two vacuum-formed stents were made over the tooth in question. Full radiographic assessment was undertaken to determine the condition of the remaining root, adjacent teeth and roots, while assessing the area dimensionally for implant placement. The patient was prepared for surgery following pre-operative consent and antibiotics together with repeated pre-operative rinsing with chlorhexidine gluconate 0.2 per cent. Standard surgical scrub and drapes were employed.

The upper left lateral incisor tooth was carefully extracted using periotomes to preserve both hard and soft tissue around the socket. This technique facilitates tooth removal without traumatizing the alveolar bone of the socket or surrounding gingival tissue. The technique can be performed for any extraction, but it is of particular importance when the subsequent placement of dental implants is envisaged.

Following atraumatic tooth removal, the socket was thoroughly irrigated, debrided and fully assessed (Fig 3). The socket was found to be intact, stable and formed from solid bone. The buccal crestal bone was found to be intact, at a good level and supporting the thick gingival genotype overlying it. Having fully assessed the socket, the implant osteotomy was undertaken, following a flapless surgery protocol with both external and internal irrigation, and using the surgical stent as a guide to the final required position.

Bone removed during the procedure was harvested (Fig 4). The osteotomy was prepared and the fixture placed slightly towards the palatal plane. The implant was seated to the desired vertical position to allow ideal soft tissue position after healing. The implant (Nobel Biocare RST 16mm NP) was inserted and torqued to 35Ncm (Fig 5). After implant placement, the socket was then reassessed. As expected there was found to be a slight void between implant and buccal plate. The harvested bone was packed into this defect, as an adjunctive graft, in order to support the buccal plate and its overlying gingivae. Having placed the implant and harvest graft, the bony socket was now supporting its overlying hard and soft tissues once more. Attention then turns towards gaining support for the crestal soft tissues. An immediate temporary abutment was torqued on to the implant again to 35 Ncm, and a Teflon cap placed over this (Fig 6). Using the second vacuum formed stent, a temporary crown was constructed using a flowable composite resin, and light cured before being removed. Following removal, the crown is added to and carefully polished, especially in the cervical area, to give a highly polished, ergonomic temporary restoration which is adequately supportive to the cervical gingival tissues, providing a circumferential seal around the marginal area.

Following final polishing, the temporary crown is luted to the temporary abutment using temporary cement. The post-operative radiograph (Fig 7) shows this situation and highlights a small excess of temporary cement which can be easily removed with floss. The temporary restoration is kept clear of the occlusion.
Given the implant is placed directly into the extraction socket, and that the adequately supportive temporary crown provides an excellent crestal gingival seal, no flap is required and consequently, no sutures are used in this procedure. Standard post-operative protocols are followed. As a result of this flapless approach, the trauma of surgery is lessened, and review one week post-surgery shows an excellent recovery (Fig 8), with very little sign of any trauma, swelling or alteration of the surrounding gingival tissue, which largely remains unchanged. After a five-to-six month healing period, during which regular review is undertaken, the temporary crown is removed using a crown remover. The temporary abutment is removed and the socket irrigated. A standard open tray impression technique is used to record the position of the implant, and the temporary abutment and crown replaced. The subsequently produced model is used to construct an abutment and crown, replicating the exact support given by the temporary set up. The case is completed by final abutment placement and torque to 35Ncm. Following trial fit, and approval of the definitive restoration, the occlusion is checked and adjusted as required. The Zirconia crown is cemented using a resin cement, with care being taken to minimise load the cement and remove any excess prior to and after cure. Occlusion is again assessed and adjusted as required. The success of the restoration is evident immediately after cementation (Fig 9); at three-month (Fig 10); six-month (Fig 11) and 18 month review (Fig 12a & b). In order to successfully perform the procedure outlined above, timing is essential, particularly in the case of the root fractured tooth. In these cases, if such treatment is not initiated in good time, the area can become infected with corresponding sinus formation and inevitable loss of the buccal plate of bone. This would entail reassessment and treatment using a multi-staged, delayed placement regime. In order to perform flapless surgery, the operator must have suitable experience, and be competent in the procedure. Added to this, as with any surgery, a full knowledge and appreciation of the anatomy surrounding the surgical site is essential to ensure a successful outcome.

It is sometimes necessary to carry out further special tests or procedures during the planning stages, to ascertain further information prior to commencement of treatment. These may include CT scanning or ridge mapping of the proposed surgical site. Following atraumatic tooth extraction and socket assessment it may, occasionally, not be possible to proceed with immediate implant placement for a number of reasons. In such cases proper planning is essential to ensure that an alternative treatment option may be undertaken. While flapless surgery incurs decreased trauma and faster healing, during any flapless procedure, it must be remembered that the operator can, at any time, raise a flap, if at all concerned with regards to surgical progress. Biological stability has been maintained from removal of the damaged root right through to cementation of the definitive restoration. By respecting and understanding the natural tissues in this way, predictably excellent results can be achieved time after time.

The clinical photographs and case discussion are included with the expressed permission of the patient involved. All of the laboratory stages for the case were completed by Lincoln Ceramics, Glasgow._

_References_

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_Contact_
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Implant treatment in the anterior mandible has favourable long-term success rates when compared with other areas of the mouth (Gokcen-Rohlig et al. 2009). Placement of dental implants in the interforaminal area is considered as a safe and predictable procedure. However, perforation of the lingual cortical plate can result in a profound and potentially life threatening sub-lingual bleed (Bucal 2008). The blood supply to this area is provided by the submental, sublingual and mylohyoid arteries which if perforated, may set-off a massive internal haemorrhage in the floor of the mouth. Although rare, this can ultimately cause protrusion of the tongue resulting in airway obstruction and necessitate surgical intervention. It has been recommended by Tepper et al (2001) that CT imaging of this area is warranted to visualise 3D bone anatomy prior to surgery, thereby reducing the possibility of surgical instrumentation of this sensitive area.

In this case report I shall show how CBCT assisted implant therapy has helped plan, simplify and execute implant therapy.
placement in the anterior mandible.

_Patient history_

A 44-year-old female who has been undergoing long term periodontal treatment presented with mobile and painful lower incisors. She exhibited very good oral hygiene but with a periapical area and mobility associated with the UR4 and grade 2 mobility of her lower incisors. The patient described difficulty and embarrassment when eating due to the movement of her lower teeth and wanted a fixed solution.

_Clinical examination_

The patient had a lightly restored dentition with a thin gingival biotype. As previously mentioned, her oral hygiene was good and she was a non-smoker (gave up 11 years previously). She exhibited bi-lateral canine guidance with no evidence of any parafunction. Her BPE scores were 312/231.

_Treatment options:_

Due to the patients’ history of periodontal disease and associated mobility, she was aware that some form of replacement was necessary. The patient did not want a removable restoration and preferred a fixed solution. In this area of the mouth either fixed bridgework or an implant retained prosthesis were possible. After discussing the options, and highlighting the increased risk of peri-implantitis of implants in patients with previous periodontal disease, [Esposito 2006] the patient opted for a fixed implant retained solution. The treatment was to be planned in such a way that if she lost her posterior molars in the future, a full arch fixed prosthesis could be made after subsequent implant placement.

_Treatment plan:_

1. Continuation of periodontal treatment and oral hygiene advice
2. CBCT Sirona Galileos scan to assess bone height, bone profile and associated anatomy.
3. Extraction of all four lower incisors and the UR4
4. Placement of two Straumann SLA active implants
5. Restoration with a Screw retained 4 unit PFM bridge

_CBCT_

It was decided to take a full volume CBCT to further assess the upper teeth and the UR4 for future implant replacement. The CBCT showed excessive bone loss around the anterior incisors with a small area of periapical radiolucency around the LL1. A cross-sectional view showed thick well developed cortical plates
Due to the patient's bone loss the lower incisors had drifted, giving a less than desirable tooth position. One of the patient's main complaints was the gaps which had appeared between the lower incisors and the uneven appearance of the incisal edges.

To aid implant placement in the correct angulation, a Cerec Blu-Cam image was taken and manipulated so that the lower tooth positions were in harmony with the rest of the dentition. This proposal was then overlaid onto the CBCT scan and was used to facilitate implant planning. The aim was to provide the patient with a screw retained bridge with access holes though the lingual aspects of the lower incisors, whilst maintaining a sound margin of safety from the lingual cortical plate.

Due to the patient's previous periodontal history, it was decided to use Straumann Standard plus implant in this case. The design of this implant incorporates a 1.8mm polished collar above the active surface of the implant. This results in the implant-to-abutment junction being located 1.8mm superiorly to the bone crest.

**Surgical procedure**

The patient was given 400mg Ibuprofen and a Chlorhexidine mouth rinse before the surgery began. The procedure was carried out under intra-venous sedation using Midazolam.

The lower incisors were removed using periotomes and forceps. The sockets were curedtted and thoroughly irrigated. A crestal incision with distal relieving incisions was made. Due to the CBCT and surgical stent only a small lingual reflection was necessary.

Implant placement was carried out using standard ITI protocols. Two Straumann SLA-Active standard plus implants of 4.1 x 10mm were placed. The implants exhibited excellent primary stability with an insertion torque of greater than 35Ncm. The patients' bone quality was estimated to be type D1-2 (Lekholm & Zarb 1985). Due to the high primary stability
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and good bone quality it was decided to adopt a single stage surgical protocol, thereby placing healing abutments over the implants. The site was closed using 5,0 PGA sutures and a tooth supported denture replacing the lower incisors was fitted. Careful examination of the denture was carried out to ensure there was no contact, or transfer of occlusal load onto the implants from the denture. The patient was seen seven days after surgery for suture removal and review.

The patient healed without incident and due to the favourable lingual undercuts of the lower teeth was able to comfortably wear the denture during the healing process. Due to financial reasons the planned implant placement for the UR4 site was deferred until a later date.

After eight weeks of healing, fixture level open tray impressions were taken in Impregum (3M ESPE), and 4-unit screw retained bridge was fabricated. The tooth set of the denture was duplicated on the final bridge as the patient was happy with the tooth size and shape. Due to the previous bone loss, pink porcelain was added to the bridge to improve the emergence and reduce the crown lengths of the lower incisors.

The bridge was seated and torqued to 35Ncm and composite placed in the access holes, a baseline long cone periapical radiograph was taken to serve as a baseline for bone level measurements. The occlusion was checked, with the patient exhibiting canine guidance in excursive movements. The patient was shown how to clean under the bridge using super floss and tepe brushes and placed on a long term maintenance programme.

**Prognosis**

The bridge has a good long-term prognosis as this patient is highly motivated, and exhibits excellent oral hygiene. She is aware of the increased risk of complications, and the possibility of losing more teeth in the long run, but after having worn a denture for three months, she is determined to avoid becoming a long-term denture wearer. The patient will see me at six-monthly intervals and sees a hygienist every three months for maintenance.
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Case study: Implant retained crowns

Author: Dr Shushil Dattani

_Treatment summary: Patient complaint and expectations_

The patient, who had a clear medical history, presented with a dull ache that appeared to be associated with a bridge in the upper left quadrant which felt "loose and spongy". Because of the existing problems with the bridge, the patient was reluctant to have a new bridge placed but wanted a long term solution. She was adamant that dentures were not an acceptable option due to her strong gag reflex. Her oral hygiene was excellent.

_Clinical examination_

No abnormalities were detected during extra-oral examination but the intra-oral clinical examination revealed:

UL4–6 VMK bridge present with the UL5 missing. UL4 had an 8mm pocket distally. UR4 also has 8mm pocket mesially. All the other teeth were healthy and her oral hygiene excellent. She was seeing the hygienist on a regular basis and her BPE score were 404/000. There was pocketing of 8mms UL4 MP, Midpoint and DB. There was also pocketing 8mms UR4 MP, Midpoint and DB.

_Radiographic and photographic examination:_

This confirmed that there was vertical bone loss mesially UR4 and distally UL5 of around 10mms. There seemed to be adequate bone height of 14mm from the sinus wall to mesial aspect of UL4, and the UL5 space had a height of 10mms from the alveolar crest to sinus wall, and UL4 14mms, (calculated from radiographic calibration using space of UL5 to calibrate). The ridge width was assessed by clinical palpation and ridge mapping which seemed adequate.

_Assessment of case_

There was a distal bone defect around the UL4. The implant could be positioned to the mesial aspect and not follow the path of the extracted socket. This would give an increased bone height availability. The options of implant length could be a 13mm or a 16mm (and internally raise the sinus by 2mms) (Nobel Biocare). With the UL5 an 8mm implant or a 10mm im-
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plant length can be considered. I felt that the lining could be successfully lifted internally, therefore placement of 16mm implant with an internal lifting length of 2mm for the UL4 and 10mm implant for the ULS. This would provide a greater surface area for integration. This would have also allowed a greater than 4.5mm space between the two implants and 1.5mm between implant and tooth structure. A prosthetic stent manufactured by the laboratory would guide the final position of the implant head for the UL4, and the implant can be thus angulated mesially.

The UR4 also had a mesial defect, and long term this will require attention but due to financial constraints, the patient did not wish to have any treatment to this tooth at this time. I advised her that if her periodontal health deteriorates, further bone will be lost, and the placement of an implant may require augmentation procedures however, following this discussion, the patient was content to continue to monitor this tooth for the time being.

**Proposed treatment**

I outlined and discussed with the patient various treatment options that included:

- no treatment
- dentures (both cobalt chrome and acrylic)
- conventional bridges
- implant retained crowns

Following this discussion and taking into account the patient’s verbal and written decision to have no treatment of the UR4, the following treatment plan was proposed:

1) Removal of upper left bridge and maintaining the UL6 as a crown. It was important that the patient had already been made aware that a new crown would be required if the UL6 crown was not intact after the bridge had been divided.

2) Replacement of the UL4 with a dental implant, which would be angled mesially to 16mm length, 3.5mm width, internally lifting the sinus membrane by 2mm. If there was an acute infection at time of surgery, the treatment would be abandoned and healing time of six weeks to three months allowed. If there seemed less bone available than anticipated, or the socket was not intact at the crestal level and 5mm from the crest (as the implant was not being placed in the socket) then the wound would be closed off and reassessed at a later date. Replacement of the ULS (as long as there was no acute infection present with UL4) with a 10mm long, 3.5mm wide implant supported crown. Should the implants be in position and adequate soft tissue was not present then a palatal flap would be considered.

3) Temporisation with a small denture avoiding the soft tissues. This would prevent movement.
of adjacent teeth and over-eruption of the opposing teeth.

4) I have discussed with the patient potential complications and the requirement of additional augmentation procedures such as bone grafting and conventional sinus grafting along with the relative risks, complexities and benefits of these procedures. We had also discussed the benefits and risks of guided tissue regeneration for minor defects.

_Treatment sequence_

**Short term:** The patient was advised of the importance of continuing hygiene treatment to stabilise the bleeding and reduce the pocketing around the UL4 and UR4 areas. A temporary denture replacing the UL45 would be constructed.

**Medium term:** The placement of implants UL45 as discussed above, and of course, maintenance of hygiene.

**Long term:** The patient was advised that alongside her home hygiene regime, it would be advisable to see the dental hygienist for treatment at least on a six-monthly basis. Post treatment reviews during the course of which I would be checking for peri-implantitis/infections, loss of integrations, loss of bone and gingival heights, and dental hygiene were recommended at intervals of three, then six months and thereafter, annually.

It was important to underline the need to monitor the bone loss around the UR4 area and the patient was advised that should further bone be lost, we would have to consider advising its extraction and prosthesis and should the crown further fracture UL6, its possible replacement with a new crown.

_Treatment appraisal_

The treatment was executed exactly as planned. The sinus was tenting in the UL4 area without perforation, no acute infection was present, the sockets were intact, and two implants were successfully positioned in the desired position. There was an initial doubt at the assessment at 10mm length when utilising the osteotomes for the UR4 implant, which was confirmed with a periapical during the surgery, when I reached an area of less dense bone levels noted.
bone rather than sinus involvement. The UL5 implant was positioned close to the sinus membrane, but no internal lifting of the membrane was carried out, and as our planning had highlighted this close positioning, I checked for and found that it was clear of perforations. The final treatment was surgically safe and sound and the patient’s periodontal health has remained stable. The patient was happy with the outcome and the natural aesthetic appearance of the prosthesis therefore the patient’s expectations have been met satisfactorily.

The treatment that was executed holds a great prognosis, as was explained in detail to the patient, who was shown how to effectively keep her mouth and the prosthesis clean. As outlined above, the risk of component fracture and teeth maintenance had been already discussed with the patient. The pocketing has substantially reduced on the UR4 to midpoint 2mms, mesiobuccally 3mms and mesiopalatally 4mms."

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*Author Info*

**Dr Shushil Dattani**, BDS, MFDP(UK), Dip-ImpDent RCS (Eng) Shushil qualified from the Royal London in 2000, followed by a two year programme and membership of the Faculty of General Dental Practice at the prestigious Royal College of Surgeons. He then continued his education for a further two years to be accredited with a Diploma in Implant Dentistry at the Royal College of Surgeons which is recognised as the gold standard qualification for implant dentistry. Shushil is a member of the Association of Dental Implantologists, the American Academy of Cosmetic Dentists and regularly speaks and trains at courses around the world including the pioneering American and British Cosmetic Dentists.
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My marketing plan

Author_ Dr James Goolnik

Fig 1
State-of-the-art Dentistry in the heart of London

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Fig 2

_2012: are you staring into the abyss?
Have you a thought out a plan for how you are going to continue growing your business?
Are you going to continue doing what you do and see diminishing returns in our struggling economy or wing it and take up opportunities as they present themselves? I would suggest you formulate your vision for three years from now. Include every area: team, marketing, sales, operations, customer service, finance, etc.

You need to imagine that you are walking into your practice three years from now. What do you see? What are patients saying about your practice? What is the team talking about in the staff room? What does your day look like? What treatments are you carrying out? What are your plans for the evening? Think about it NOW and WRITE it down. Studies repeatedly show that writing your thoughts down and then sharing them with your close friends make them more likely to happen. It makes you accountable.

Your vision document will probably fill three pages. Re-read and refine it. Once you are happy with it, share it with your team. It will help them understand their role and whether this is the sort of practice they would love to be associated with. Once you have your plans, don’t just bury them away in your desk. Take them out at least every month and read them out loud. Do they still excite you? Perhaps you have changed your mind. Tweak and revisit this picture regularly.

_Marketing first steps

Before you formulate an expensive plan of how you are going to populate your daybook with loads of new patients, ask yourself: Do you know what sort of patients you want to treat? Do you know why your current patients come and see you? What is your ideal patient? Everyone has a different idea of what makes a patient ideal; some characteristics are non-negotiable, like ‘pays their bills on time’; some may not be important to you, like ‘smells nice’. For me, the ideal patient:

• Is punctual and informs you if he or she is running late
• Is a raving fan (enjoys being in your practice and refers others, who also become raving fans) some practices never need to do any marketing; the raving fans do it for them
Respects you and other team members—often they are respectful to the clinical team but not to the office staff

Listens to your clinical advice and then makes an informed decision

Attends all maintenance and hygiene appointments as prescribed

Smells nice and knows which end of a toothbrush to use and actually uses it!

Just ask your existing patient base and as you slowly weed out the subprime ones you will eventually be left with a majority of ideal patients. Among these, there will be some who fit all the criteria but only attend when they have a minicrisis. They are to all intents and purposes ideal because when they visit you they follow all your advice and become healthy again, although they usually disappear into the ether until another mini-crisis looms.

Many clinicians find asking for referrals quite stressful and wonder what to do if the patient refuses. I have never had this happen, probably thanks to a technique I have developed. It needs a bit of practice, but the following line (your version of it) tends to work, especially if it is delivered after a course of treatment:

“You know what, Mrs Graham, I have really enjoyed taking care of you over the last few weeks. Our practice grows by recommendations from people like you. If you know any family members, friends or colleagues who need treatment I would love to take care of their dental needs. Here are a couple of my business cards.”

I would empower all of the clinical team to have this conversation at the end of a course of treatment before the patient goes back into the re-care system. I also believe in the use of referral cards (Fig 1). These should encompass the ethos of your practice and establish an emotional connection to what you believe in.

What do you do when they contact you?

Often the first contact is asking for prices. It is impossible for you to know whether such prospective patients are just fishing around to compare prices and that is the way they judge dental services. Perhaps that is the only way they know to judge dentistry and it is your opportunity to educate them that dentistry is not chosen on price alone. Does your team just reply back to them, do they try to call them and encourage them to visit your practice? Often the team replies to an e-mail, doesn’t get a response and then deletes the e-mail. What would your results be if you tried again a day later to contact them?

If still no joy, perhaps contact them again in a week. “You recently contacted us and we have been unable to get in touch. I was just seeing whether your dental needs have already been taken care of. If not, we would love to have the opportunity to show you how Bow Lane is different from other practices. Please get back in contact and we look forward to welcoming you to our practice.” I would then file their contact details and perhaps if they had asked about a specific service, say Invisalign, then make contact again when you have an offer or new information on that particular service.

Online presence

You don’t need an award-winning website, but can the type of patients you are trying to attract find you online? When they find you, is what they see attractive, giving them confidence in contacting you? Do you have many different ways for them to contact you? I have noticed recently more new patients contacting me via Facebook or Twitter. I think this is because dentists can seem inapproachable and hidden behind the reception team. They tend to ask a simple question and the conversation grows from that. I am in the middle of a €6,000 treatment plan on a patient from Vienna. He found me through Facebook and there were 24 e-mails over a two-month period until he started treatment.

How easy is it for a patient to have a conversation with you (Fig 2)?

Why should a patient be friends with your practice on Facebook or Twitter? People like to feel part of something, a community. People like to talk, share stories and get access to unique information, whether it is hearing about something first or getting deals. Think about the newsletters you subscribe to, the people you follow on Twitter, etc. If they are always trying to sell something, you quickly get bored or find them inauthentic.

No matter what the technology you are using is, it is about a quality interaction with like-minded people. I get concerned when people
get all excited about the latest thing, for example QR (quick response) codes (Fig 3). It does not stop you communicating with that person any differently; it is just a fast way of them accessing information. Don’t just jump on the next bandwagon; get your team interacting in an authentic and engaging way FIRST. The only way you can do this is to hire the right people and then it’s over to good leadership and training.

Are the different ways of contacting you clearly visible? Gone are the days when dentists were stuck in ivory towers. The consumer is well informed and their attitude to discounts and deals is really changing.

Now not just about saving money: it’s the excitement, the chase of the best deal. Groupon has opened consumers’ eyes. I definitely don’t recommend that a dental practice start advertising on these sites; some practices nearly went bankrupt when they did.

MORE FOR LESS: While many people may have less money to spend right now, consumers everywhere will forever look to experience more. What is your customer experience?

THE MEDIUM IS THE MOTIVATION: Consumers are now being alerted to offers and deals via new (and therefore infinitely more exciting and attractive) technologies.

BEST OF THE BEST: With instant mobile or online access to not only deals but also reviews, consumers can now be confident they’re getting the best price for the best product or service. What does your Google review say?

And next? An even bigger ‘deal ecosystem’, more personalisation, more loyalty schemes, more pressure on you to deliver deal-immune brilliance as an integral part of your dental care.

Brush strokes:

- Look at ALL your marketing materials and practice stationery. Is it all on brand?
- Take a look at your Google reviews.
- Take a look at your website on mobile devices like the Blackberry, iPhone and iPad.
- Why should a patient follow you on social media?

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Whilst the value of the dental microscope is widely acknowledged across the treatment spectrum, its impact has been most keenly felt in the field of endodontics.

Implant dentistry is one particular application where the introduction of the microscope has brought significant benefits to every phase of the treatment protocol. Implant treatment may take place over several weeks and involve delicate and complex surgery where absolute clarity of view is vital to achieve the optimum outcome with minimal peripheral tissue damage or invasion. Studies have demonstrated that the accuracy of such procedures is almost always improved when surgeons enlist the aid of a microscope, a clear indication that employing microsurgical techniques in implantology offers advantages over more traditional methods. The surgeon is able to place the implant through a relatively minute incision in the gingiva, thus minimising tissue trauma and significantly reducing the pain experienced by the patient; healing and osseointegration are both expedited, and overall aesthetic results enhanced.

A high specification, high magnification microscope is especially valuable in more challenging cases involving, for example, sinus elevations or the need to place implants proximal to other sensitive anatomic structures. The current generation of advanced microscopes allows unimpeded stereoscopic vision whilst dedicated illumination enables the delivery of high-contrast, true-colour images of even the most inaccessible areas to be viewed with clarity and in comfort. These state-of-the-art microscopes feature lenses of supreme precision which incorporate apochromatic technology to eliminate chromatic aberration, and filters which not only prevent premature curing but can enhance the visibility of specific tissue types.

A modern dental microscope offers more than simply a hugely magnified image of the treatment site. The combination of magnification with intense, shadowless, panoramic illumination from an integrated co-axial light source brings into view features previously imperceptible, even through the use of dental loupes. Typical benefits include enabling more accurate drilling of the lateral socket wall to achieve greater stability for the implant, leading in turn to more accurate alignment and the promotion of optimal function and aesthetic appeal.
With space at a premium in many surgeries, microscopes are designed to be compact with many featuring internal cabling to minimise hazards and maximise convenience. Integrated or attachable cameras represent a practical pairing of advanced technologies, where magnified video footage or images can both assist the clinician and also involve the patient in explanations of diagnosis and treatment progress. For many patients implants are an elective procedure, and greater understanding invariably increases compliance and take up rates. Images can also be used in documenting procedures for future reference, or edited for teaching purposes or presentations.

Back problems caused by working for sustained periods in a crouched or crooked posture are a recognised occupational hazard for dental professionals, and a single implant appointment can mean up to two hours of sitting in the same position. Using a dental microscope with a 1800 tiltable tube allows a break in the pattern, as the clinician is obliged to assume a more upright posture and so relieve accumulated stress and fatigue.

Quality, custom designed dental microscopes are easy to control and react intuitively to minimise procedural disruption. Complex surgery demands intense concentration, and the more sophisticated microscopes offer versatile mobility and superb operational convenience through the incorporation of a MORA (Mechanical Optical Rotating Assembly) interface. MORA enables the practitioner to reposition the microscope with one hand, whilst still remaining comfortable, regardless of any change in the viewing angle. Motorised adjustments of the focal length and a range of focal distances allow practitioners to work at their own ideal working distance and with magnification options such as a five-step magnification changer a detailed, close-up view can easily be alternated with a complete site overview.

The acquisition of a surgical microscope with its provision of vastly enhanced visual acuity instantly increases the practitioner’s range of treatment options, and many dentists have found that microscopic examination methods have transformed both the accuracy of their diagnoses and their working methodology. It’s also true that in a competitive environment, and with a technologically aware public, advanced instruments and equipment are vital to ensure a practice’s continuing success. However, the purchase of a microscope, with all the potential it offers to exploit the latest treatment techniques, is usually a one off occasion, and both the unit itself and the supplier should be chosen with care.

Carl Zeiss is a name associated worldwide with the finest quality optical equipment and Nuview, Carl Zeiss’ exclusive UK distributor, offers an impressive portfolio of dental microscopes as well as training and workshops to introduce practitioners to their immense possibilities.

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Sident: Scan plan finish & fit...first impressions to lasting restorations in a single session

Scan plan finish & fit... first impressions to lasting restorations in a single session Digital impressions are being sent to laboratories, CT scans are being sent to bureaux, patients are being referred to hospitals and implantologists etc. The key to making these different processes help you is to create a workflow that adds value to your practice. However, how do you implement digital processes that will give your practice the best set up for the future?

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Diary Dates

2012

Association of Dental Implantology UK
Tuesday 15th May
Yorkshire

Association of Dental Implantology UK
Thursday 17th May
Essex/Hertfordshire

Association of Dental Implantology UK
Monday 21th May
Preston

Association of Dental Implantology UK
Thursday 31st May
Scotland

Association of Dental Implantology UK
Monday 11th June
Chester

Association of Dental Implantology UK
Wednesday 13th June
Belfast

Association of Dental Implantology UK
16th June
Edinburgh Training & Conference Venue, 16 St. Mary's Street, Edinburgh, Eh1 1SU

Association of Dental Implantology UK
Raj Wadhwani “Computer-Guided Implant Surgery - The Status Quo
Wednesday 6th June
Warwickshire

Association of Dental Implantology UK
Thursday 16th June
Newcastle

International Events 2012

WID International Dental Exhibition
1–2 June
Avignon, France

EUROPERIO
6–9 June
Vienna

Nobel Biocare Symposium
15–16 June
Hamburg, Germany

2012 FDI World Dental Congress
15–16 June
Hong Kong

World Dental Show
5–7 October
Mumbai

AAID Meeting
3–6 October
Washington DC

EAO Congress
11–13 October
Copenhagen

DENTEX
18–20 October
Milan

Expodental
18–20 October
Göteborg

Swedental
15–17 November
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ADF 2012 Conference and Trade Exhibition
27 November – 1 December
Paris
submissions: formatting requirements

**Please note** that all the textual elements of your submission:

- the complete article,
- all the figure captions,
- the complete literature list, and
- the contact info (bio, mailing address, E-mail address, etc.)

must be combined into one Word document. Please do not submit multiple files for each of these items.

In addition, images (tables, charts, photographs, etc.) must not be embedded into the Word document. All images must be submitted separately, and details about how to do this appear below.

**Text length**

Article lengths can vary greatly—from a mere 1,500 to 5,500 words—depending on the subject matter. Our approach is that if you need more or less words to do the topic justice then please make the article as long or as short as necessary.

We can run an extra long article in multiple parts, but this is usually discussing a subject matter where each part can stand alone because it contains so much information. In addition, we do run multi-part series on various topics.

In short, we do not want to limit you in terms of article length, so please use the word count above as a general guideline and if you have specific questions, please do not hesitate to contact us.

**Text formatting**

Please use single spacing and un-indented paragraphs for your text. Just place an extra blank line between paragraphs.

We also ask that you forego any special formatting beyond the use of italics and boldface, and make sure that all text is left justified.

If you would like to emphasise certain words within the text, please only use italics (do not use underlining or a larger font size). Boldface is reserved for article headers.

Please do not "centre" text on the page, add special tab stops, or use underling as all of this must be removed before layout. If you require a special layout, please let the word processing program you are using help you to do this formatting rather than doing it by hand on your own.

If you need to make a list, or add footnotes or endnotes, please let the Word processing program do it for you automatically. There are menus in every program that will help you to do this. The fact is that no matter how careful one might be, errors have a way of creeping in when you try to hand number footnotes and literature lists.

**Image requirements**

Please number images consecutively throughout the article by using a new number for each image. If it is imperative that certain images are grouped together, then use lowercase letters to designate the images in a group (ie 2a, 2b, 2c).

Please put figure references in your article wherever they are appropriate, whether that is in the middle or end of a sentence. If you are not directly mentioning the figure in the body of your article, when it appears at the end of the sentence the figure reference should be enclosed within parenthesis and be inside the sentence, meaning before the fullstop.

In addition, please note:

- We require images in TIF or JPEG format.
- These images must be no smaller than 6x6 cm in size at 300 DPI.
- Images cannot be any smaller than 80 KB in size (or they will print the size of a postage stamp!).

Larger images are always better, and something on the order of 1 MB is best. Thus, if you have an image in a large size, do not bother sizing it down to meet our requirements but send us the largest file sizes available. (The larger the starting image is in terms of bytes, the more leeway the designer has in terms of resizing the image to fill up more space should there be room available).

Also, please remember that you should not embed the images into the body of the text document you submit. Images must be submitted separately from the textual submission.

You may submit images through a zipped file via E-mail, unzipped individual files via E-mail, or post a CD containing your images directly to us (please contact us for the mailing address as this will depend upon where in the world you will be mailing them from).

Please do not forget to send us a head shot photo of yourself that also fits the parameters above so that it can be printed along with your article.

**Abstracts**

An abstract of your article is not required. However, if you choose to provide us with one, we will print it in a separate box.

**Contact info**

At the end of every article is a Contact Info box with contact information along with a head shot of the author. Please note at the end of your article the exact information you would like to appear in this box and format it according to the previously mentioned standards. A short bio may precede the contact info if you provide us with the necessary information (60 words or less).

**Questions?**

Please contact us for our Author Kit, or if you have other questions:

Group Editor
Lisa Townshend
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Lisa Townshend
Group Editor
What’s Missing?

Three global titles from the Dental Tribune International portfolio are coming to the UK. Published quarterly, each of these glossy, clinically-focussed titles aims to bring you the latest developments in the fields of implantology, endodontics and cosmetic dentistry in a clear, easy to read format.

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<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
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<tr>
<td>Lab Analogue</td>
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<tr>
<td>Stock abutment + Screw</td>
<td>£140</td>
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<td>Lab Crown and charges</td>
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<tr>
<td>Total</td>
<td>£350</td>
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</table>

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