IMPLANTS

a general overview

Dr Tom Bereznicki BDS (Edin)
OSSEOKINTEGRATION INTRODUCED TO DENTISTRY IN 1982
EACH MANUFACTURER HAS THEIR OWN “COATING” WHICH COVERS THE SURFACE OF THE IMPLANT – THIS SURFACE ENCOURAGES BONEY INTEGRATION AND SOFT TISSUE ATTACHMENT

The introduction of Roxolid allows clinicians to utilise new implant designs with narrower bodies and appropriate platforms in a variety of situations.

Straumann Roxolid Slactive implants – A real breakthrough in implant dentistry

Global leaders in implant dentistry, regenerative and CAD/CAM solutions, Straumann has developed a breakthrough with their new implant line. Featuring an advanced combination of the Roxolid material and Slactive surface on all implant diameters with the new Loxim transfer piece for simplified handling.

Expanding to all diameters, Straumann’s new generation of Roxolid Slactive implants provides clinicians with the benefits of Roxolid’s exceptional material strength (50% stronger than pure titanium), together with the excellent osseointegration properties offered by Slactive surface technology. Together, the award-winning materials (Frost & Sullivan Medical Device Technology of the Year Award) ensure greater confidence in all cases for the entire implant team; successfully enabling the treatment of more patients, reducing the need for additional bone grafting and decreasing treatment time, which can ultimately result in higher patient acceptance rates.

In introducing Loxim, the new pre-mounted, self-retained transfer piece offers clockwise and counter-clockwise rotations for one step implant insertion, the holding key is no longer required to remove the transfer piece helping to make implant placement more efficient.
PLATFORM SWITCH/CONICAL CONNECTION/’LAZERLOCK’
Bränemark System™ Mk IV TiUnite®

Differences from Bränemark System Mk III TiUnite

- Flange closer to abutment seating surface
  Increased threaded area designed to enhance initial stability.

- Slightly tapered body
  Enhanced initial stability in soft bone.

- Shallow cutting edges on threads
  Designed for soft bone indications.

NobelSpeedy™ Groovy

Design advancements over Bränemark System Mk IV TiUnite

- Coronal design
  TiUnite on collar designed to preserve crestal bone.

- Slightly larger edges on threads
  Designed for dense bone indications.

- Groovy
  Grooves added to the threads have proven to promote bone growth.

- Tapered apex
  Allows for under-preparation of surgical site to improve initial stability in soft bone.
NOBEL REPLACE
NOBEL ACTIVE
THE TERM PLATFORM SWITCHING OR BIOHORIZON'S “LAZERLOK”. ORIGINALLY THE IMPLANT RESTORATION WAS FABRICATED TO BE FLUSH WITH THE PLACED IMPLANT (a). MORE RECENTLY THE BELIEF IS THAT FITTING THE RESTORATION INTO THE IMPLANT PROVIDES A MORE PREDICTABLE BIOLOGICAL OUTCOME AND LONGTERM SUCCESS. THE CHOICE OF SYSTEM USED IS GENERALLY LEFT TO THE IMPLANTOLOGIST.

NOBEL ZYGOMATIC
AMONG OTHER FACTORS SUCH AS GOOD GENERAL HEALTH, NOT SMOKING ETC FOR SUCCESSFUL PREDICTABLE IMPLANT PLACEMENT, THE FOLLOWING MUST BE AVAILABLE:

• Bone quality
• Bone width
• Bone height

BONE HEIGHT AND WIDTH CAN BE INCREASED WITH GRAFTING BUT BONE QUALITY CANNOT BE IMPROVED
BONE QUALITY

VARIATES NATURALLY IN THE MOUTH AND THE SUITABILITY OF SITES IN DESCENDING ORDER ARE:

• lower anterior area between the mental foramen
• lower molar region
• upper anterior region
• upper molar areas
BONE QUALITY CANNOT BE ALTERED. HOWEVER MANUFACTURERS HAVE ALTERED IMPLANT DESIGN TO GIVE GREATER STABILITY IN SOFTER BONE. THE WIDER AND MORE SPACED THREADS OF THE **NOBEL ACTIVE IMPLANT** IS ONE SUCH EXAMPLE.
BONE WIDTH

WIDTH IS ESSENTIAL TO IMPLANT PLACEMENT. THE NARROWEST IMPLANT (EXCLUDING ONE-PIECE OR MINI IMPLANTS) IS 3.0MM AND IDEALLY IT SHOULD BE SURROUNDED BY 1.5MM OF BONE. A MINIMUM OF 6.00MM IS THEREFORE NECESSARY BETWEEN THE ADJACENT TEETH. BONE WIDTH BUCCO-LINGUALLY CAN GENERALLY ONLY BE INCREASED BY BONE GRAFTING USING THE PATIENT’S BONE e.g. RAMUS OF THE MANDIBLE, USING ARTIFICIAL BONE SUCH AS BIOOSS PRIOR TO SURGERY, OR BY SURGICAL RIDGE EXPANSION AT THE TIME OF PLACEMENT IN THE UPPER ARCH. GRAFTED BONE IS PINNED IN PLACE AND ALLOWED TO INTEGRATE FOR UP TO 6 MONTHS BEFORE IMPLANT PLACEMENT.
EVEN WITH BONE GRAFTING, THE INCREASE IN WIDTH ACHIEVABLE HAS ITS LIMITS. THE BONE GRAFT SHOWN EARLIER ONLY ALLOWED PREDICTABLE PLACEMENT OF 3mm IMPLANTS.
**CBCT SCANNING** is not only invaluable, but in certain cases essential, in implant planning. Apart from showing the position of anatomical structures such as the ID canal and sinuses, it also shows the bone width available.
THE ADDITIONAL INFORMATION AVAILABLE FOR PLANNING ON A CBCT SCAN IS SHOWN HERE. THE PA SHOWS 11.3mm OF BONE HEIGHT TO THE ID CANAL. THE SCAN SHOWS THAT THE NARROWNESS OF THE RIDGE IS SUCH, THAT WHEN THE IMPLANT IS PLACED, IN ORDER TO ACCOMODATE THE WIDTH OF IMPLANT, THE HEIGHT OF BONE AVAILABLE DECREASES TO LESS THAN 8.00mm
CBCT AND ITS ASSOCIATED SOFTWARE CAN BE USED TO CREATE 3D IMAGES OF THE JAWS ETC AND, THESE WITH THE BENEFIT OF 3D DIGITAL PRINTING, CAN BE USED TO MAKE MODELS AND, AS EXPLAINED LATER, STENTS FOR GUIDED SURGERY — NOBEL GUIDE
BONE HEIGHT

It takes little imagination to appreciate that this patient has no viable bone to allow implant placement in the lower arch other than perhaps in the mid-line.
TO ACCOMMODATE LIMITATIONS OF BONE WIDTH AND HEIGHT, IMPLANTS ARE MANUFACTURED IN VARIOUS SIZES. THE WIDTH RANGES FROM 3.00mm (rarely other than for single lower or upper lateral incisors) TO 6.00mm AND THE LENGTH FROM 6.00mm TO 15.00mm. ZYGOMATIC IMPLANTS (for extreme maxillary atrophy) CAN BE AS LONG AS 5.5cm
THE AVAILABLE BONE HEIGHT IS DEPENDENT ON A NUMBER OF FACTORS:

- Atraumatic extractions!!!
- The degree of bone resorption following extraction
- Anatomical considerations
- The development of new surgical techniques

ALWAYS TRY TO ADOPT BONE PRESERVATION TECHNIQUES
USE OF ROOTS AS OVERDENTURES IS PERFECT FOR BONE PRESERVATION – YOU CAN NEVER BE SURE THAT YOUR PATIENT WILL NOT WANT IMPLANTS ONE DAY! TRY TO USE ATRAUMATIC EXTRACTION TECHNIQUES AND AVOID ACRYLIC TISSUE BORNE DENTURES TO REPLACE MISSING TEETH. IF ONLY ONE OR TWO TEETH ARE MISSING TRY TO USE ADHESIVE BRIDGES AS REPLACEMENTS
USE OF AN IMMEDIATE MARYLAND BRIDGE TO PRESERVE BONE, REFINE EMERGENCE PROFILE AND AID IDEAL POSITION IMPLANT PLACEMENT
ANATOMICAL CONSIDERATIONS
IN THE AREA OF THE SINUSES ARTIFICIAL BONE CAN BE GRAFTED INTO THE SINUS EITHER BEFORE OR DURING IMPLANT PLACEMENT. THE PROCEDURE IS CALLED A SINUS LIFT.
TECHNIQUES HAVE ALSO BEEN DEVELOPED TO ALLOW IMPLANT PLACEMENT WHICH AVOID ANATOMICAL STRUCTURES. THE NOBEL “ALL-ON-FOUR” DESIGN AVOIDS THE SINUSES IN THE UPPER ARCH AND THE ID CANAL IN THE LOWER ARCH. THESE PROCEDURES USUALLY REQUIRE A “GUIDED” SURGICAL TECHNIQUE.
MORE RECENTLY THE TECHNIQUE OF PLACING NOBEL ZYGOMATIC IMPLANTS HAS GIVEN A FURTHER OPTION IN THOSE CASES WHERE THE MAXILLARY BONE IS ATROPHIC AND MORE THAN FOUR IMPLANTS ARE REQUIRED FOR ADEQUATE RESTORATIVE SUPPORT IN THE UPPER ARCH.
EVEN IN SEEMINGLY HOPELESS CASES WITH ALMOST NO MANDIBULAR BONE OR AVAILABLE RIDGE TO SUPPORT A LOWER DENTURE, TWO IMPLANTS CAN OFTEN BE PLACED TO ALLOW PROVISION OF AN OVERDENTURE. THIS AREA WITH LOW BONE HEIGHT IS ALSO COMMONLY RESTORED WITH MINI IMPLANTS TO HELP RETENTION WITH AN OVERDENTURE
The patient may have the implants submerged subgingivally with Cover Screws in place for up to 6 months. After integration the implants are surgically exposed and healing abutments fitted while the soft tissues heal.

The implants may be fitted with healing abutments at implant fixture head level at the time of placement.

The implants may have healing caps fitted over multiunit abutments fitted at the time of placement.

The patient may have had an Immediate Load restoration fitted at the time of placement.
COVER SCREWS
HEALING ABUTMENTS

These are fitted at the time of surgical placement if restoration will be at fixture head level. After three month bony integration, the abutments are unscrewed, impressions taken at fixture head level, and the abutments replaced until the fit appointment. They prevent tissue overgrowth and food entering the hollow implants.
ON REMOVAL OF THE HEALING ABUTMENTS THE FIXTURE HEAD IS REVEALED - THE SCREW THREAD IS CLEARLY VISIBLE INSIDE THE IMPLANT. THE CUSTOM COMPUTER MILLED, SCREW RETAINED, TITANIUM ABUTMENTS ARE SEEN TORQUED INTO PLACE – THE SCREW HEAD IS VISIBLE INSIDE THE ABUTMENT
A CLINICAL CASE SHOWING HEALING ABUTMENTS IN PLACE. THE CHOSEN DESIGN IS A SCREW RETAINED PFM BRIDGE FITTED AT FIXTURE HEAD LEVEL. THE CONNECTOR IS AN INTEGRAL PART OF THE FINAL RESTORATION.

IF A HEALING ABUTMENT COMES LOOSE IT SHOULD BE REPLACED AS SOON AS POSSIBLE TO PREVENT FOOD PACKING INTO THE IMPLANT AND GINGIVAL OVERGROWTH.
MULTIUNIT ABUTMENTS
USUALLY FITTED AT THE TIME OF IMPLANT PLACEMENT. THERE ARE TWO TYPES – STRAIGHT AND ANGLED
MULTI UNIT ABUTMENTS, WHETHER STRAIGHT OR ANGLED, ARE FITTED WITH **HEALING CAPS** DURING THE PERIOD OF OSSEOINTEGRATION AND RESTORATION. WITH THE CORRECT DRIVER THEY ARE SIMPLY SCREWED BACK INTO PLACE WITH FINGER PRESSURE. AS THEY PREVENT TISSUE OVERGROWTH THEY SHOULD BE REPLACED AS SOON AS THEY COME LOOSE OR ARE LOST.
ANGLED ABUTMENTS ALLOW THE RE-ALIGNMENT OF THE IMPLANT HEAD SO THAT THE SCREWS HOLDING THE FINAL PROSTHESIS IN PLACE EMERGE IN THE CORRECT PART OF THE RESTORATION i.e. LOCATED IDEALLY ON THE OCCLUSAL SURFACE POSTERIORLY OR PALATALLY/LINGUALLY IN THE ANTERIOR QUADRANT.
REALIGNMENT DEMONSTRATED. THE IMMEDIATE LOAD CONVERSION DENTURE FITTED ON THE DAY OF SURGERY SHOWS SCREW HOLES EMERGING BUCCALLY THROUGH THE FRONT TEETH – THIS IS VERY DIFFICULT TO DISGUISE AESTHETICALLY. ANGLED ABUTMENTS MOVED THE ACCESS CAVITIES TO A BETTER RESTORATIVE LOCATION WITH SCREW ACCESS PALATALLY PLACED.

ACCESS CAVITIES NOW LOCATED PALATALLY. THEY ARE FILLED WITH PFTE TAPE AND COMPOSITE ON FINAL FIT.
CONNECTORS BETWEEN THE IMPLANT AND FINAL RESTORATION
THE RESTORATIVE OPTIONS

• Crowns or bridges cemented onto screw retained Procera Titanium or Zirconia milled abutments
• Crowns or bridges screw retained at fixture (implant) level
• Crowns or bridges screw retained on multiunit abutments

As a general rule implants should be splinted together if at all possible – stability and long-term success are much improved in comparison to individual implant crowns
WHY SPLINT?
ALL ZIRCONIA SCREW RETAINED BRIDGE DESIGNED TO BE FITTED AT FIXTURE-HEAD
SIMPLE OVERDENTURES
BAR RETAINED PROSTHESES
CEMENTED RESTORATIONS

If the final design of the implant restoration is to be cemented crown(s) or bridgework, the implants need to have restorative abutments fitted. The definitive crowns are cemented onto them. These abutments can be:

- prefabricated
- custom computer designed and milled in either Titanium or Zirconia
IN CERTAIN SITUATIONS PREFORMED ABUTMENTS CAN BE USED. MANY COME AS JUST ONE SHAPE/SIZE AND EITHER REQUIRE ADAPTATION TO THE CLINICAL SITUATION OR IN THE LABORATORY.
EXAMPLES OF CUSTOM COMPUTER MILLED TITANIUM ABUTMENTS
THE BLUISE TINGE OF THE TITANIUM ABUTMENT SHINING THROUGH THE GINGIVA IS CLEARLY SEEN ABOVE THE LATERAL INCISOR IN THE LEFT PHOTO. IN THE OTHER PHOTO, THE AESTHETICS ABOVE THE LATERAL INCISOR ARE EXCELLENT AS THE ABUTMENT IS FABRICATED IN ZIRCONIA.
A FELDSPATHIC LAYERED ZIRCONIA CEMENTED BRIDGE ONTO ZIRCONIA MILLED SCREW RETAINED ABUTMENTS. WHEN USING A CEMENTED DESIGN, THE BRIDGE SHOULD BE CEMENTED WITH A TEMPORARY CEMENT TO ALLOW REMOVAL SHOULD ONE OF THE SCREWS EVER LOOSEN AND REQUIRE TIGHTENING – IT IS REFERRED TO AS RETRIEVABILITY.
LEARNING FROM FAILURE AND THE DEVELOPMENT OF NEW TECHNIQUES

With the passage of time protocols were changed. Learned opinion was that wherever possible:

• Any restorative procedures, particularly impressions, should be kept away from fixture head level so as not to disturb the biological junction between the tissues and the implant

• In situations where cemented restorations were being provided, if the cement is not completely cleaned away, perimplantitis is highly inevitable

• Ideally all restorations should be provided as screw retained at multiunit abutment level
THE DIFFERENCE BETWEEN WORKING AT Fixture HEAD LEVEL AND ABUTMENT LEVEL
SCREW-RETAINED PFM BRIDGE FITTED AT ABUTMENT LEVEL
UNDER TODAY'S PROTOCOLS THIS DEVELOPMENT OF THE EMERGENCE PROFILE WOULD BE CARRIED OUT AT ABUTMENT NOT FIXTURE LEVEL
THE FINAL RESTORATIONS WOULD ALSO BE AT ABUTMENT LEVEL
IDEALLY WE NO LONGER WOULD RESTORE ANY CASE WITH MILLED ABUTMENTS AT FIXTURE HEAD LEVEL IF WE COULD AVOID IT. AS MUCH AS POSSIBLE WE TRY TO WORK AT ABUTMENT LEVEL.
THEN
NEVER SPLINT IMPLANTS TO TEETH
PROBLEMS ASSOCIATED WITH CEMENTED RESTORATIONS
TRY TO AVOID LEAVING CEMENT BEHIND UNDER THE GINGIVA IF RECEMENTING A CROWN. BONE LOSS TENDS TO BE AN INEVITABLE CONSEQUENCE. MY WEBSITE HAS AN EXCELLENT ARTICLE ON SCREW RETAINED V CEMENTED RESTORATIONS AND ASSOCIATED RATIONALE TO AVOID COMPLICATIONS.
THIS CASE SHOWS FAILING IMPLANTS AS A RESULT OF RETAINED CEMENT SUBGINGIVALLY AMONG THE CROWDED IMPLANTS
SINGLE TEETH CANNOT BE RESTORED ON A MULTIUNIT ABUTMENT AS THE ROUND SHAPE HAS NO RESISTANCE FORM TO ROTATION AND WOULD QUICKLY LOOSEN IN FUNCTION. AS A GENERAL RULE THE FABRICATED CROWN AND MILLED ABUTMENT HAVE TO BE CEMENTED EXTRAORALLY, POLISHED AND THEN FITTED. THE CROWN IS FABRICATED WITH AN ACCESS CAVITY TO ALLOW THE CROWN TO BE SCREWED INTO PLACE. ANTI-ROTATION IS PROVIDED BY THE CONVENTIONAL MILLED ABUTMENT
THE ADVENT OF MONOLITHIC MILLED PORCELAIN HAS ALLOWED THE FABRICATION OF ONE PIECE SCREW RETAINED PROCERA ZIRCONIA ABUTMENTS WHICH ARE LAYERED WITH FELDSPATHIC PORCELAIN
THE PROBLEM WITH THE SINGLE TOOTH TECHNIQUE JUST SHOWN IS THAT IMPRESSIONS ETC ARE STILL AT FIXTURE HEAD LEVEL. NOBELBIOCARE HAVE JUST INTRODUCED A NEW SYSTEM CALLED **ALL1** WHICH HAS A PREFABRICATED ‘MULTIUNIT’ ABUTMENT WITH AN ANTI-ROTATION ELEMENT INCORPORATED.
IMPLANT PLANNING AND GUIDED SURGERY
‘Occlusal loading of a fully integrated implant can be the point of success or failure long term. Implant stability can be quickly lost if not introduced into a healthy occlusal environment – an environment where stress is minimised by good anterior guidance, posterior disclusion and good centric stops. Light occlusal stops on implant teeth need routine adjustment to maintain proper occlusal timing with the natural dentition. Occlusal overload and lateral interferences will quickly show signs of bone loss around the implants’

7 Deadly Sins of Implants – Dawson Academy, Nov ‘15
Implant planning for multiple implants is complex. The implants must be placed where the bone is, while at the same time avoiding anatomical landmarks. In simpler cases planning can be carried out with just an OPG and periapical radiographs. However, where implants may be close to either the maxillary sinus or the ID canal, CBCT scanning is indicated to give a three-dimensional view of the bone width as well as the exact extent of the anatomical structures that may influence implant position. Software is now available which allows the information on the scan to be used to print 3D models. A further innovation is planning implant placement on the computer and fabricating a stent which fits into the mouth and is used to carry out “guided surgery”. The angle and depth of implant placement is controlled by the stent during surgery, eliminating the risk associated with freehand placement.
THIS 20 YEAR OLD PATIENT WAS INVOLVED IN A RTA 28 YEARS AGO FRACTURING HER MANDIBLE AND LOOSING HER LOWER ANTERIOR TEETH AND ASSOCIATED BONE. SHE REFUSED TO CONTEMPLATE WEARING A PARTIAL DENTURE AND INSISTED ON FIXED BRIDGEWORK. Owing to the “bucket handle” design, over the years the bridge suffered fatigue fracture of porcelain. The development of “guided surgery” allowed planned implant placement in this case.
VIRTUAL IMPLANT PLACEMENT WAS UNDERTAKEN WITH THE SOFTWARE PROGRAMME
IMPLANT PLACEMENT WAS ALSO SIMULATED ON A VIRTUAL MODEL IN ORDER TO DESIGN A SURGICAL GUIDE STENT
IMPLANT SIZES AND LENGTHS WERE CHOSEN
AN ACRYLIC STENT WAS CONSTRUCTED BY 3D PRINTING TO FIT THE EXISTING TEETH. THE HOLES SHOWN ARE FITTED WITH PRECISION MACHINED CYLINDERS WHICH CORRESPOND TO THE PLANNED IMPLANT WIDTHS, DEPTHS AND POSITIONS DEVELOPED ON COMPUTER. THESE CYLINDERS ACT AS DEFINITIVE GUIDE PLANES AND DEPTH LIMITERS DURING IMPLANT PLACEMENT.
THE PHOTOS SHOW THE STENT BEING LOCATED AND SECURED IN THE MOUTH. AS THE EXACT POSITION FOR IMPLANT PLACEMENT IS KNOWN, FLAP SURGERY IS NOT NECESSARY. ACCESS TO THE UNDERLYING BONE IS MADE WITH A GINGIVAL PUNCH ALLOWING ACCESS FOR EACH IMPLANT TO BE LOCATED INTO PLACE.
THESE PHOTOS SHOW TWO IMPLANTS ALREADY IN SITU AND THE THIRD BEING TORQUED INTO PLACE THROUGH THE STENT
ON COMPLETION OF THE PROCEDURE THE STENT IS REMOVED. THE ‘PUNCH’ HOLES AND THE NEWLY PLACED NOBELREPLACE IMPLANTS CAN CLEARLY BE SEEN BEFORE AND AFTER THE HEALING ABUTMENTS HAVE BEEN PLACED. THIS STYLE OF IMPLANT PROCEDURE, WHICH DOES NOT REQUIRE INCISIONS AND IS THEREFORE NON-INVASIVE, ENSURES THAT POST-OPERATIVE DISCOMFORT IS MINIMAL AND SWELLING RARE. THE EXISTING BRIDGE WAS USED AS A TEMPORARY DURING INTEGRATION.
THE EXCELLENT FINAL CLINICAL RESULT IS OBVIOUS. THE ORIGINAL BRIDGEWORK WAS THE BEST OPTION THAT MONEY COULD BUY IN 1983. THE PROGRESS OF DENTISTRY AND LABORATORY FABRICATION OF IMPLANT RETAINED PROSTHESIS IS SELF-EVIDENT. THE DEVELOPMENT OF PINK PORCELAIN IN RECENT YEARS HAS TRANSFORMED AESTHETIC DENTISTRY.
In certain cases where there is no infection associated with the tooth to be extracted, for example following trauma, and bone levels and volume are adequate, an implant can be placed at the time of extraction. The implant can be loaded with a laboratory fabricated screw retained crown in acrylic or composite later the same day. The crown must be designed to ensure it is out of centric occlusion and all excursive mandibular movements for the duration of the bony integration.
THE PATIENT TRIPPEd JOGGING. THE SOFT TISSUE DAMAGE IS OBVIOUS
RADIOGRAPHIC EXAMINATION SHOWS A HORIZONTAL ROOT FRACTURE AND THE TOOTH IS UNSAVEABLE. AN EMERGENCY ESSIX RETAINER IS CONSTRUCTED TO KEEP THE PATIENT COMFORTABLE.
ATRAUMATIC EXTRACTION AND PRESERVATION OF THE BUCCAL PLATE IS ESSENTIAL FOR THIS TECHNIQUE AND IS USUALLY IDEALLY LEFT TO THE IMPLANTOLOGIST TO CARRY OUT AT THE TIME OF PLACEMENT. THE IMPLANT IS PLACED FOLLOWING EXTRACTION AND, IF ADEQUATE FIXATION IS ACHieved, IMPRESSIONS FOR THE LABORATORY FABRICATION OF THE TEMPORARY CROWN TAKEN.
THE TEMPORARY CROWN MAY NOT LOOK NATURAL BUT PATIENTS PREFER THIS OPTION TO WEARING AN ACRYLIC DENTURE. IF TREATED CONVENTIONALLY IT WOULD REQUIRE 3 MONTHS FOR BONY HEALING FOLLOWING THE EXTRACTION, THEN PLACEMENT AND A FURTHER 3 MONTHS BEFORE THE FINAL IMPLANT RESTORATION IS PLACED. THE DEFINITIVE CROWN IS SHOWN IN PLACE ON THE RIGHT.
The press like to use the term “Teeth in a Day”. In fact many hours are involved in case planning, the provision of an immediate denture, and case management while bony healing takes place following multiple extractions. On “the day” implants are placed in the morning and the existing denture converted to a screw retained acrylic bridge with the fit taking place later the same afternoon. The definitive acrylic/Titanium screw retained framework can be fabricated 3 months after surgery.
‘Occlusal loading of a fully integrated implant can be the point of success or failure long term. Implant stability can be quickly lost if not introduced into a healthy occlusal environment – an environment where stress is minimised by good anterior guidance, posterior disclusion and good centric stops. Light occlusal stops on implant teeth need routine adjustment to maintain proper occlusal timing with the natural dentition. Occlusal overload and lateral interferences will quickly show signs of bone loss around the implants’

7 Deadly Sins of Implants – Dawson Academy, Nov ‘15
THE Refined appearance achieved with the immediate denture
THE ANTERIOR OPEN BITE HAS BEEN CORRECTED AND A WIDER ARC PROVIDED TO IMPROVE AESTHETICS
A NORMAL OCCLUSION HAS BEEN PROVIDED WITH THE CROSS-BITE ELIMINATED
THE RADIOGRAPHIC PICTURE PRE AND POST IMPLANT PLACEMENT
A SCREW RETAINED FULL ARCH BRIDGE IS THE MOST PREDICATABLE OF ALL IMPLANT RESTORATIONS. THE EXISTING UPPER DENTURE WAS CONVERTED IN THE LABORATORY ON THE DAY OF IMPLANT PLACEMENT AND FITTED AT THE END OF THE DAY.
THE CLINICAL PICTURE 3 MONTHS AFTER SURGERY
THE FINAL AESTHETIC RESULT ACHIEVED
WHAT IS RETRIEVABILITY?
WITH SINGLE IMPLANTS RETRIVABILITY IS RECOMMENDED IN CASE THE UNDERLYING SCREW COMES LOOSE. EITHER THE CROWN SHOULD BE CEMENTED WITH A WEAK CEMENT eg TEMPBOND OR THE DESIGN OF THE CROWN SHOULD INCORPORATE AN ACCESS CAVITY
FAILURES
HOW BAD CAN IT BE? THE IMPLANT HAS BEEN PLACED IN THE BUCCAL SULCUS AND NOT FULLY SEATED. BEING SO FAR BUCCALLY IT CANNOT BE USED AS AN OVERDENTURE ABUTMENT
POORLY PLANNED IMPLANTS. ON THE LEFT SIDE THE IMPLANT IS TOO DISTALLY PLACED LEAVING A SPACE BETWEEN THE CROWN AND THE TOOTH IN FRONT. ON THE RIGHT SIDE THE DESIGN IS POOR AS THERE IS A DOUBLE CANTILEVER - SCREW FRACTURE OR IMPLANT FAILURE ARE A LIKELY COMPLICATION. FOOD PACKING IS INEVITABLE IN BOTH CASES.
AVOID ADJACENT IMPLANTS IN THE AESTHETIC ZONE. IT IS IMPOSSIBLE TO CREATE INTERDENTAL PAPILLAE BETWEEN TWO ADJACENT IMPLANT SUPPORTED CROWNS

SLIDES COURTESY OF DR MICHAEL WISE
TRY TO AVOID LEAVING CEMENT BEHIND UNDER THE GINGIVA IF RECEMENTING A CROWN. BONE LOSS TENDS TO BE AN INEVITABLE CONSEQUENCE. MY WEBSITE HAS AN EXCELLENT ARTICLE ON SCREW RETAINED V CEMENTED RESTORATIONS AND ASSOCIATED RATIONALE TO AVOID COMPLICATIONS

ORIGINAL BONE LEVEL AT THE TIME OF IMPRESSION FOR THE FINAL

RETAINED CEMENT

NEW BONE LEVEL AFTER A FLARE-UP
GENERALLY, IMPLANTS SHOULD REPLACE EVERY OTHER TOOTH WITH THE “MISSING
TEETH” RESTORED AS PONTICS. THIS CASE SHOWS IMPLANT CROWDING AND FAILING
IMPLANTS WHERE IT WAS IMPOSSIBLE TO REMOVE THE RETAINED CEMENT
ARTIFICIAL BONE GRAFTING IS NOT ALWAYS SUCCESSFUL. THIS IMPLANT HAS FAILED BRINGING THE BIOSS GRAFTED BONE WITH IT
IMPLANTS FAIL

PERIODONTAL SUSCEPTIBILITY

PERIMPLANTITIS

ORAL HYGIENE AND REGULAR THREE MONTHLY HYGIENE VISITS
Oral Hygiene – ovate pontics
OVATE PONTIC FORM ALLOWS EASY PREDICTABLE ORAL HYGIENE
POOR SADDLE DESIGN RESULTS IN POOR ORAL HYGIENE AND IMPLANT FAILURE
MULTIPLE IMPLANT FAILURE 12 YEARS POST PLACEMENT. IS SMOKING THE MAIN CAUSE?
SOMETIMES YOU JUST DON’T KNOW WHY - FAILURE OF 11 YEAR OLD IMPLANTS IN 18 MONTHS
POOR IMPLANT PLACEMENT WITH THE EMERGENCE OF THE RETENTION SCREWS BUCCALLY AND THE IMPLANTS TOO CLOSE TOGETHER. THE DENTURE IS FRACTURING IN THE MIDLINE. GOOD AESTHETICS ARE IMPOSSIBLE TO ACHIEVE AS THE ACCESS CAVITIES CANNOT BE COVERED ADEQUATELY. THE IMPLANT POSITIONING IS IMPOSSIBLE TO CORRECT WITH MULTIUNIT ABUTMENTS
WAS ANY PLANNING OF ANY SORT INVOLVED IN THIS CASE?
IMPLANT FRACTURE AND PROSTHETIC SCREW LOOSENING OR FRACTURE
FRAMEWORK OR ABUTMENT FRACTURE
ROOT TREAT OR EXTRACT/IMPLANT

Bear in mind that implants are regarded as successful if retained but failing, whereas a root treated tooth is a failure unless there is complete radiographic resolution!
Dental implants and associated developments are now being used for more than simply replacing teeth. CBCT technology now allows surgical templates to be made in advance of jaw resection. The template is used to cut the correct shape of the missing bone from e.g. the shoulder blade, as well as planning implant placement and immediate loading to be carried out at the time of surgery.
IMPLANTS ARE ALSO BEING USED FOR RETENTION OF FACIAL PROSTHETICS
A MILLED TITANIUM BAR HAS BEEN SCREWED INTO THE THREE IMPLANTS AND MAGNETS IN THE BAR USED AS RETENTION FOR THE ARTIFICIAL NOSE
THE EXCELLENT RESULT ACHIEVED – PREVIOUSLY PATIENT’S ARTIFICIAL NOSES HAD TO BE ATTACHED TO SPECTACLES
A patient with their eye and surrounding socket removed surgically following malignancy.
FIVE IMPLANTS PLACED IN THE EYE SOCKET SUPPORTING A MILLED TITANIUM BAR AND FOUR MAGNETS TO RETAIN THE PROTHETIC EYE
THE PROSTHETIC EYE IN PLACE
IMPLANTS IN GENERAL PRACTICE

• General oral hygiene – do not use metal instruments on implants as they scratch the surface and plaque adheres more readily to the roughened surface

• Patients should have regular three monthly hygiene visits

• For a general radiographic examination of many implants a high resolution OPG gives as much information as, if not more, than numerous peri-apical radiographs

• Loose healing caps or healing abutments – healing caps are not crucial as there is less chance of tissue over-growth. Healing abutments should be replaced as quickly as possible to prevent further tissue collapse and overgrowth over the implant head and food impaction into the implant. If a driver is not available, at least fit the abutment to finger pressure and refer the patient for definitive treatment. If a driver is available torque to 10N

• Loose implant/crown – take a radiograph. If the whole implant is loose – extract. If only the crown/abutment complex see below

• Loose screw retained crown with access cavity – The access cavity is usually filled with composite and if you have the necessary wrenches, drill out the composite, unscrew the crown, clean the crown, implant and abutment with chlorhexidine, replace and tighten the assembly to 30N. Place some PFTE tape into the access cavity and place a composite filling over the top

• Loose screw retained crown with no access cavity – refer to an implant specialist

• Loose crown cemented onto an abutment – check the abutment is secure and use a temporary cement such as TempBond to allow retrievability. Ensure both the abutment and crown are free of old cement and ensure all cement sub-gingivally is removed on re-cementation. Generally keep the amount of cement placed in the crown to a minimum to avoid large amounts of excess below gum level

• Acute infection around an implant – prescribe a wide-spectrum antibiotic and refer
TIPS RELATED TO IMPLANTS

• Atraumatic extractions to preserve bone
• Consider over-dentures to help preserve bone
• Tooth borne replacement of teeth wherever possible unless short term immediate dentures are being provided
• Use the healing period following extractions to refine the patient’s appearance – this allows the implantologist to plan placement around the new appearance ie implants in the right place and at the correct angle!!
• Do not buy an implant kit as a Christmas present, partake on a weekend course at an airport hotel and think you are now an implantologist
• Learn to work with a skilled implantologist and be mentored in the restorative aspects of pre and post implant placement. Work as a team!
• The provision of implants and associated restorative dentistry is very complex but extremely rewarding. Patients lives are transformed by having teeth again. The demand is growing!
ACKNOWLEDGEMENTS

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