AUDLEY DENTAL SOLUTIONS

Bone grafting

1

Definition

Bone grafting or 'augmentation', is the technique used to re-build bone that has been lost from the structure of the jaw. This loss of bone, or bone 'atrophy' is the bodies normal response to: tooth loss, infection, gum disease and trauma.

Dental implants only function well for the long term and provide an aesthetic replacement for a natural tooth when completely submerged and surrounded by healthy bone. It is often the case, that when people are assessed for implant suitability, they present with less than the ideal quantity or contour of bone where the replacement tooth is required.

One of the important decisions to be made at the dental implant consultation, or assessment stage, is, how much bone is available and what is the 3d shape of the bone at the planned implant position. This assessment is done initially through visual examination, palpation of the bone ridge and possibly with the aid of an existing conventional 2d digital x-ray. The most up to-date method is to employ 'low dose' 3d imaging using Cone Beam CT, for example the Gendex DP700 as used in our practice. Cone Beam CT provides an accurate 3d x-ray image which can be manipulated by sophisticated computer software to allow accurate measurement of the area under consideration. This software also allows the 'virtual' positioning of an implant at the planned position to accurately determine whether the ideal amount of bone is present, or if not, then the shape and volume of bone to be grafted or 'augmented'. Two broad types of bone grafting are available to us: a. Guided Bone Regeneration – where human, animal, plant or synthetic material in the form of granules are molded and adapted to the bone defect, covered with a collagen membrane and allowed to heal under the gum, or b. Block Grafting, where a block of bone (human) is positioned in the defect and allowed to heal prior to placement of the implant.

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2

Guided Bone Regeneration

Guided bone regeneration, is utilized where the bone defect is small and no increase in bone height is required. It is generally performed at the same time as the implant is positioned. The bone defect is cleaned and packed with the granules of material which have been mixed either with sterile saline or the patients' own blood. This 'wetting' of the granular material allows it to be shaped and formed, very much like 'wet sand' can be shaped and molded. The material then needs to be covered with a collagen membrane to prevent soft tissue 'gum cells' growing into the material and to encourage new bone to form. This grafted material generally needs to be left for a minimum of 12 weeks before the next stage of the implant treatment can proceed. The materials used include: a. Patients own bone (small fragments of bone retrieved from the preparation of the implant site or the adjacent bone ridge). This method has the obvious biological advantage of being the patients' own tissue and hence the risk of infection or rejection is decreased, it has the dis-advantage that generally only small amounts of bone can be 'harvested' from the implant site. b. Animal bone e.g. Bovine (Cow) derived material (Bio-Oss ® www.geistlich.co.uk) which has been carefully prepared and treated to make it completely safe for human use. The advantage of this material is that any required amount is available, the disadvantage is that the material remains in the jaw and the patients' own bone grows between the granules of Bovine bone producing a 'concrete' type mix of natural bone and bovine bone. This technique has become the standard method of re-constructing small bone defects and indeed has many years of sound scientific research behind it. c. Plant derived material e.g. Algipore ® (www.dentsply.co.uk), has the advantage for those patients concerned about the use of animal products, but has the dis-advantage that this material has not such a long research 'track record'. d. synthetic products, mainly based on tri-calcium phosphate e.g. Symbios ® (www.dentsply.co.uk) have been used for many years in Orthopaedic surgery and have the advantage that the material is thought to be fully resorbed and replaced by natural bone as the bodies tissues turn over.

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Block Grafting

Block Grafting, is used where larger bone defects are present or where the height of the bone ridge has been compromised. This technique can be used for a single tooth site or even a whole jaw ridge can be re-constructed. Traditionally, this technique used patients 'own bone' either from a different site in the jaw or even from a patient's hip. The challenges with such procedures are that two wounds are created causing more post-operation swelling, pain and bruising. More recently we have exciting new techniques to employ, where bone donated from a live donor (the bone removed from a hip replacement operation) is processed and made safe for use in implant surgery. This alleviates the need for two wounds in the mouth and greatly reduces post operation side effects. The bone from Botiss ® (www.Botiss.co.uk) bone regeneration materials come in the form of blocks, rings or even custom made segments of bone specifically produced to fit a specific patients jaw: Botiss bone ring ® and Botiss Bone Builder ®. Chris is one of the few implantologists in the UK to pioneer these techniques developed by Professor Giesenhagen in Stuttgart. He has made several trips to Germany and also to Vienna medical school to perfect his skills with these treatments.

We have had great success with all of these techniques. Complications or failures are exceptionally rare, which means that patients presenting with the challenges of reduced bone volume, who have healthy mouths, can nearly always enjoy the benefits that implant treatment can provide.

We are proud to be able to provide these innovative treatments for the benefits of our patients.

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