



## **BONE GRAFTING – REPLACING LOST OR DAMAGED BONE**

By Dr. Carlo Ferretti

Of all our body features, the one that imparts to us the characteristic of individuality is our face. The facial skeleton forms the bedrock on which the drape of skin lies and thus changes to this skeleton have profound influence on both the form and function of our face. Bone may be lost as a result of injury, a disease, or surgical removal due to bone tumours.

The replacement of missing bone to re-establish the form of the face and the various functions it subsumes is a cornerstone of treatment. Moreover, the burgeoning requirement for the replacement of missing teeth with osseointegrated dental implants has required the evolution of a large array of bone replacement techniques to repair the considerable jaw bone loss associated with the loss of teeth. Maxillofacial and oral surgeons are intimately involved in repairing damage to the facial skeleton which may involve the replacement of missing skeleton by *bone grafting*.

Once you and your surgeon embark on a treatment which requires bone replacement, or grafting, several potential options will be considered:

### **THIS BONE IS MY BONE...**

Undoubtedly the most effective bone replacement available is your own bone (known as an autologous bone graft). The bone is removed from a healthy site in your body, in such a way that the function and shape of the donor bone is not adversely affected. There are many sites in your body from which bone can be removed, also referred to as the donor site, and include the upper or lower jaw, the skull, ribs, hip bone and the lower leg.

The choice of where the bone is removed from, or harvested, will depend on several factors. Most importantly is the size and site of the defect which requires reconstruction, also referred to as the recipient site, and whether alternative techniques will suffice. Unfortunately harvesting bone increases the discomfort of surgery and can result in complications of its own. It is thus reserved for conditions when no other technique will suffice. The disadvantages of autologous bone grafting have stimulated the development of many alternatives which may obviate the need to harvest your own bone.

### **...THIS BONE IS YOUR BONE...**

The use of tissues from another human being to repair or replace missing or damaged body parts dates back to antiquity. When Professor Christiaan Barnard first transplanted a human heart, this concept captured the public's imagination and the use of human tissue has since become routine medical practice. Its use for bone replacement is no exception.

The major advantage of bone from another human being, referred to as an allogeneic bone graft, is that it does not require another surgical site to remove your own bone. Its clinical performance is however not comparable to autologous bone and thus its use is limited to specific situations. Whilst there is a theoretical risk of disease transmission, as with any human tissue, practically it is a very safe product to use. The allogeneic bone available in this country is harvested from donors who have been exhaustively screened for the most important infectious diseases and only those who test negative are considered as donors. The preparation of the bone prior to grafting further reduces the chances of disease transmission.

### ...THIS BONE'S THE COW'S BONE

A final bone replacement alternative is the use of bone from a different species, referred to as a xenograft which originates from the Greek *xenos* for stranger. The only bone xenograft routinely available is cow bone. It has the same advantages and disadvantages of an allograft including the theoretical risk of disease transmission. Its track record is however unblemished and exhaustive measures are taken to ensure that it remains a safe alternative.

### COMPLICATIONS

Whilst rare, complications do unfortunately occur following bone grafting at both the recipient site and at the donor site, and may include infection, pain and bruising, numbness of the skin around the donor site, and finally failure of the graft to make new bone requiring a repeat grafting procedure.

Nevertheless, bone replacement has become routinely predictable and millions of procedures are successfully performed annually around the world. A thorough preoperative examination and consultation with your surgeon will provide you with the details of your specific procedure. By ensuring that your treatment decision is fully informed and allowing you to embark upon your surgery with confidence.

