



Bone Grafting

Major and Minor bone grafting

Over a period of time, the jawbone associated with missing teeth atrophies or is reabsorbed. This often leaves a condition in which there is poor quality and quantity of bone suitable for placement of dental implants. In these situations, most patients are not candidates for immediate placement of dental implants.

Today, we have the ability to grow bone where needed. This not only gives us the opportunity to place implants of proper length and width, it also gives us a chance to restore functionality and esthetic appearance.

Major Bone Grafting

Bone grafting can repair implant sites with inadequate bone structure due to previous extractions, gum disease or injuries. The bone is either obtained from a tissue bank or your own bone is taken from the jaw, hip or tibia. Sinus bone grafts are also performed to replace bone in the posterior upper jaw. In addition, special membranes may be utilized that dissolve under the gum and protect the bone graft and encourage bone regeneration. This is called guided bone regeneration or guided tissue regeneration.

Major bone grafts are typically performed to repair defects of the jaws. These defects may arise as a result of traumatic injuries, tumor surgery, or congenital defects. Large defects are repaired using the patient's own bone. This bone is harvested from a number of different sites depending on the size of the defect. The hip (iliac crest) and lateral knee (tibia) are the most common donor sites. These procedures may require surgery in a hospital operating room and require a hospital stay.

Sinus lift procedure

The maxillary sinuses are behind your cheeks and on top of the upper teeth. Sinuses are air-filled cavities that have air and a very thin membrane lining. Some of the roots of the natural upper teeth extend up into the maxillary sinuses. When these upper teeth are removed, there is often just a thin wall of bone separating the maxillary sinus and the mouth. Dental implants need bone to hold them in place. When the sinus wall is very thin, it is impossible to place dental implants in this bone.

A sinus graft or sinus lift graft creates enough bone so implants can be placed. The dental implant surgeon exposes the area and the sinus membrane is then lifted upward and donor bone is inserted into the floor of the sinus. After a few months of healing, the bone becomes part of the patient's jaw and dental implants can be inserted and stabilized in this new sinus bone. The sinus graft makes it possible for many patients to have dental implants when years ago there was no other option other than wearing loose dentures.

Sinus augmentations and implant placement can sometimes be performed as a single procedure. Enough bone must exist between the upper jaw ridge and the bottom of the sinus to stabilize the implant well. If the bone is inadequate, the Sinus Augmentation will be performed first. The graft will then mature for several months and then the implants can be placed.

Ridge Expansion

In severe cases, the ridge has been reabsorbed and a bone graft is placed to increase ridge height and/or width. This is a technique used to restore the lost bone dimension when the jaw ridge gets too thin to place conventional implants. In this procedure, the bony ridge of the jaw is literally expanded by mechanical means. Bone graft material can be placed and matured for a few months before placing the implant.

Nerve - repositioning

The inferior alveolar nerve, which gives feeling to the lower lip and chin, may need to be moved in order to make room for placement of dental implants to the lower jaw. This procedure is limited to the lower jaw

and indicated when teeth are missing in the area of the back molars and premolar. Since this procedure is very aggressive, less aggressive options are considered first.

Platelet Rich Plasma

Platelet Rich Plasma (PRP) is exactly what its name suggests. The substance is a by-product of blood (plasma) that is rich in platelets. Until now, its use has been confined to the hospital setting. This was due mainly to the cost of separating the platelets from the blood and the large amount of blood needed to produce a suitable quantity of platelets. New technology permits the doctor to harvest and produce a sufficient quantity of platelets from only 55 cc of blood drawn from the patient while they are having outpatient surgery.

Why all the excitement about PRP?

PRP permits the body to take advantage of the normal healing pathways at a greatly accelerated rate. During the healing process, the body rushes many cells and cell-types to the wound in order to initiate the healing process. One of those cell types is platelets. Platelets perform many functions, including formation of a blood clot and release of growth factors (GF) into the wound. These GF (platelet derived growth factors PGDF, transforming growth factor beta TGF, and insulin-like growth factor ILGF) function to assist the body in repairing itself by stimulating stem cells to regenerate new tissue. The more growth factors released sequestered into the wound, the more stem cells stimulated to produce new host tissue. Thus, one can easily see that PRP permits the body to heal faster and more efficiently.

A subfamily of TGF, is bone morphogenic protein (BMP). BMP has been shown to induce the formation of new bone in research studies in animals and humans. This is of great significance to the surgeon who places dental implants. By adding PRP, and thus BMP, to the implant site with bone substitute particles, the implant surgeon can now grow bone more predictably and faster than ever before.

PRP has many clinical applications

- Bone grafting for dental implants. This includes onlay and inlay grafts, sinus lift procedures, ridge augmentation procedures, and closure of cleft, lip and palate defects.
- Repair of bone defects creating by removal of teeth or small cysts.

- Repair of fistulas between the sinus cavity and mouth.

PRP also has many advantages

- **Safety:** PRP is a by-product of the patient's own blood, therefore, disease transmission is not an issue.
- **Convenience:** PRP can be generated in the doctor's office while the patient is undergoing an outpatient surgical procedure, such as placement of dental implants.
- **Faster healing:** The high concentration of the wound with PRP, and thus growth factors, produces an increase of tissue synthesis and thus faster tissue regeneration.
- **Cost effectiveness:** Since PRP harvesting is done with only 55 cc of blood in the doctor's office, the patient need not incur the expense of the harvesting procedure in hospital or at the blood bank.
- **Ease of use:** PRP is easy to handle and actually improves the ease of application of bone substitute materials and bone grafting products by making them more gel-like.

Frequently asked questions about PRP

Is PRP safe? Yes. During the outpatient surgical procedure a small amount of your own blood is drawn out via the IV. This blood is then placed in the PRP centrifuge machine and spun down. In less than fifteen minutes, the PRP is formed and ready to use.

Should PRP be used in all bone-grafting cases? Not always. In some cases, there is no need for PRP. However, in the majority of cases, application of PRP to the graft will increase the final amount of bone present in addition to making the wound heal faster and more efficiently.

Will my insurance cover the costs? Unfortunately not. The cost of the PRP application is paid by the patient.

Can PRP be used alone to stimulate bone formation? No. PRP must be mixed with either the patient's own bone, a bone substitute material such as demineralized freeze-dried bone, or a synthetic bone product, such as BIO-OSS.

Are there any contraindications to PRP? Very few. Obviously, patients with bleeding disorders or hematologic diseases do not qualify for this in-office procedure. Check with your surgeon and/or primary care physician to determine if PRP is right for you.