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| **Name:** |
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| **Basic Science Question:** |
| What is a bone graft? |
| **Report:** |
| Bone grafts are surgical procedures that serve to promote the regeneration of bone structure using material from the patient’s own body, material from another individual of the same species, material from another individual of a different species, or synthetic material. Bone grafts are used to replace bone that has been lost due to a number of different potential factors including trauma, periodontal disease/tooth loss, or congenital deformations. This procedure can be very beneficial in treating these abnormalities because of the fact that osteoblasts, bone building cells, allow bone to have the ability to regenerate if given ample space. The process of developing new bone is known as osteogenesis.  In order for a restorative material to be effective in building new bone, it should be osteoconductive and osteoinductive. Osteoconduction is when a bone graft material acts as a scaffold for new bone growth. In Osteoconductive materials, osteoblasts will use the material to spread and build new bone along the provided scaffold. Osteoinductive materials promote the development of new osteoblasts which increases the integration speed of the bone graft.  There are many types of bone grafts that use different materials that have osteoconductive, osteoinductive, and/or osteogenic properties. Autografts are bone grafts that utilize bone from the same individual. Bone can be harvested from non-essential areas and implemented back into the treatment area of the same patient. A disadvantage of atographs is that another surgical site is required. An allograft is a bone graft that is harvested from another human being, most often a cadaver. These bone grafts usually require sterilization and deactivation of proteins before implemented into the new site. Xenografts are similar to allografts except, the bone graft is harvested from another species that is not human. There are also synthetic compounds that can be used as bone graft material. Hydroxyapatite, a naturally occurring mineral, is one example of a synthetic bone graft that is used because of its osteoconduction, hardness, and compatability with natural bone. Hydroxyapatite is often used with other minerals like calcium to increase resorbability. |
| **References:** |
| |  | | --- | | Kumar P, Vinitha B, Fathima G. Bone grafts in dentistry. *J Pharm Bioallied Sci*. 2013;5(Suppl 1):S125-S127. doi:10.4103/0975-7406.113312 | |  | |