# Bone autograft

Common donor sites: iliac crest, rib, fibula, bone removed during decompression.

Characteristics: 1. PROS: no histocompatibility or disease transmission issues

2. CONS: a) persistent post-op donor site pain:occurs in asmany as 34% of patients(these verity of which was graded as “unacceptable” in 3%)

b) increased surgical risks of:

- blood loss
- wound infection
- fracture
- cosmetic deformity
- increased operative time to procure
- numbness from nerve injury (e.g. cluneal nerves)
- hematoma

3. subtypes a) cancellous bone:provides all graft components except mechanical stability

b) cortical bone:

- provides superior and immediate mechanical strength
- has diminished osteoinduction and osteoconduction capacity

c) cortico cancellous bone: e.g. tricortical iliac crest wedge. Contains all bone graft components

d) vascularized autograft:

- technically challenging
- best suited for areas that are scarred, irradiated, or that span long segments

e) autologous bone marrow:

- source of osteoprogenitor cells and osteoinductive substrates
- diminished donor site risks
- no osteoconductive nor structural properties

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Bone grafting is a surgical procedure that replaces missing bone in order to repair bone fractures that are extremely complex, pose a significant health risk to the patient, or fail to heal properly.

Bone generally has the ability to regenerate completely but requires a very small fracture space or some sort of scaffold to do so. Bone grafts may be autologous (bone harvested from the patient's own body, often from the iliac crest), allograft (cadaveric bone usually obtained from a bone bank), or synthetic (often made of hydroxyapatite or other naturally occurring and biocompatible substances) with similar mechanical properties to bone. Most bone grafts are expected to be reabsorbed and replaced as the natural bone heals over a few months' time.

The principles involved in successful bone grafts include osteoconduction (guiding the reparative growth of the natural bone), osteoinduction (encouraging undifferentiated cells to become active osteoblasts), and osteogenesis (living bone cells in the graft material contribute to bone remodeling). Osteogenesis only occurs with autograft tissue and allograft cellular bone matrices, such as Trinity ELITE (MTF/Orthofix), BIO4/Stryker) and Osteocel Plus (AlloSource/NuVasive).

Autograft bone can be reasonably considered as one of the possible alternatives to be used in the surgical management of cervical disc disease.

## Contamination

A high rate (12%) of autograft contamination can be expected during autograft preparation for anterior cruciate ligament reconstruction. The contamination rate is almost equal for both bone-patellar tendon-bone and hamstring tendon autografts. It could not be identified an association between contaminated grafts implanted in the knee and postoperative inflammatory markers such as the erythrocyte sedimentation rate and the C reactive protein level [1].

The incidence of contamination of local bone autograft during PLIF was considerable, and positive culture results were significantly associated with postoperative spinal infection. Special attention focused on the preparation of local bone for autograft and its microbiological culture will be helpful for the control of postoperative spinal infection [2].

1)
Hantes ME, Basdekis GK, Varitimidis SE, Giotikas D, Petinaki E, Malizos KN. Autograft contamination during preparation for anterior cruciate ligament reconstruction. J Bone Joint Surg Am. 2008 Apr;90(4):760-4. doi: 10.2106/JBJS.G.00806. PubMed PMID: 18381313.
2)
Lee CS, Kang KC, Chung SS, Kim KT, Shin SK. Incidence of microbiological contamination of local bone autograft used in posterior lumbar interbody fusion and its association with postoperative spinal infection. J Neurosurg Spine. 2016 Jan;24(1):20-4. doi: 10.3171/2015.3.SPINE14578. Epub 2015 Sep 11. PubMed PMID: 26360142.