

ALLOGRAFTS (Cadaver Grafts)

What is an allograft?

An allograft, otherwise known as a “donor graft”, is tissue that is transplanted from one person to another. The most common type of allograft is bone, although tendons, skin, heart valves and corneas are also frequently used. Allografts are utilized by doctors for a wide variety of surgical procedures and have yielded excellent results for many years. The graft we use most commonly for anterior cruciate ligament (ACL) reconstruction of the knee is the “patellar tendon allograft”. Depending upon the circumstances we use hamstring and Achilles tendon allografts. Some knee ligament surgeons use other tendons such as the anterior tibialis or posterior tibial tendon.

Where do allografts come from?

The availability and benefits of allografts are made possible only through the generous gift of donation. Organ and tissue donation is voluntary and represents a gift from the donor or donor’s family intended to enhance the quality of others’ lives. Donated tissues are surgically removed from the donor after death using aseptic operating room techniques.

How are the quality and safety of allografts ensured?

Quality assurance for all allografts begins well before the tissue is removed from the donor. A review of the donor’s complete medical and social history marks the beginning of a thorough screening for risk factors. Potential donors may be disqualified due to history of cancer, infections, neurological and autoimmune disease, drug abuse or a number of other exposures or behaviors that might result in a risk to the recipient. Tissue banks also have maximum age “cut offs” for allograft procurement.

In addition, all donated tissues are quarantined until a battery of blood tests can be analyzed. The donor’s blood must test negative or non-reactive for the following:

- Antibody to Human Immunodeficiency Virus 1 and 2 (anti HIV 1 and 2)
- Hepatitis B Surface Antigen (HbsAg)
- Hepatitis B Core IgG/IgM Antibody (HbcAb)
- Antibody to Hepatitis C (anti-HCV)
- Antibody to Human T-Cell-Lymphotropic Virus Type I and II (anti-HTLV Type I and II)
- Rapid Plasma Reagin or Serologic Test for Syphilis (STS by RPR)
- Human Immunodeficiency Virus DNA using Polymerase Chain Reaction (HIV PCR DNA)

Microbial analyses are also performed as a criterion for acceptance of potential donor tissue. Once approved for processing, all tissue is aseptically processed. Most tissues are processed using cleaning methods that remove virtually all blood products, further reducing the possibility of disease transmission. Additionally, some allografts may be sterilized by irradiation. It is important to understand that radiation of tissues can affect the mechanical properties of the grafts. A low dosage irradiation will “sterilize” the tissue from bacteria but does not “sterilize” the tissue from viruses (e. HIV, hepatitis, etc). To “sterilize” the tissue from viruses the dosage used is so high that it mechanically alters the structure of the tissue. This probably explains why some of the “older” allograft literature

reported had higher failure rates than autograft tissue (patient's own tissue). Final microbial analyses of processed grafts are completed prior to release for distribution. Allografts may be provided fresh or may be preserved by freezing or freeze-drying. An advantage of "fresh frozen" tissues is that they are stored at temperatures that significantly reduce the "antigenicity" or ability to initiate an immune response. We have historically used fresh frozen tissues from one "not for profit" tissue bank.

The tissue bank we use has a Quality Assurance program that requires two Medical Records Specialists, one QA specialist and the Medical Director to review all donor charts prior to processing the tissue. Following processing, a Production Control Specialist and a QA specialist review the charts again to approve each allograft for release and distribution.

Their procedures meet industry standards established by the American Association of Tissue Banks (AATB) and the Food and Drug Administration (FDA).

What are the risks?

Although the risk is extremely low, an allograft recipient assumes some risk of disease transmission. It is estimated that the risk of a recipient contracting HIV from a transplanted allograft is less than one in 1.6 million. The tissue bank we use makes every effort to eliminate this unlikely possibility and has never had a substantiated incident of any type of disease transmission. Your surgeon will address any potential risks associated with receiving an allograft transplant.

What are the benefits?

Allografts can offer a number of advantages over autografts, depending on the type of surgical procedure performed. Your body may not have a sufficient amount of bone or tendon for harvesting autograft tissue, thereby necessitating the use of allograft tissue. Additionally, the use of allograft tissue could avoid the increased pain and risk associated with the surgical site required to harvest autograft tissue, and the increased cost that may be incurred by additional operating room time or recovery time.

How Often are Allografts Used?

It is estimated that over 750,000 allograft tissues are currently implanted nationally on an annual basis. In Dr. Bach's practice the usage of allograft tissue for ACL surgery has changed dramatically. Between 1986-1990 they were used 1%, 1991-1995 (3%), 1996-2000 (13%), 2001-2005 (34%), and since 2006 over 50% of patients have allograft tissue used for their reconstructive procedures.

As a generalization allograft tissues are discussed with patients for several situations: 1) age over 40, 2) associated minimal to mild arthritis of knee cap (patellar) problems, 3) previous ACL surgery ie revision reconstruction, 4) petite patient size that precludes use of native tissues, 5) multiligament reconstruction, 6) skeletally immature patient with significant growth remaining.

In our practice if we evaluate graft usage by age decade: >40: 100%, 30-40 years: 66%, 20-30 years: 40%, >20 years: <5%

What is Our Experience using Allograft Tissue?

We have published the results of our experience with allograft tissues and reported that 95% of our patients had stable knees at a minimum 2 year and average 4 year follow up time interval. Additionally, 95% of patients were either completely or mostly satisfied with the procedure.