INTRODUCTION

Ligament reconstructions involve replacing an injured ligament by a tendinous graft peroperatively removed from the patient (autograft) or extracted from a human cadaver (allograft) submitted to sterilization and storage in tissue libraries after removal.1 This process requires more careful attention, aiming to assure a pathogen-free graft.

The tissue sterilization method is difficult and controversial; techniques are based on the use of ethylene oxide or gamma rays. The previous has been used for over 40 years as gas, showing a high toxicity level. As a result, regulatory authorities established minimum residual levels after sterilization process. The use of gamma rays, in turn, requires care, since high irradiation levels can damage biomechanical properties of tissues; after using it, nucleic acid is changed, releasing free radicals, leading to dysfunction and destruction of microorganisms present on tissues. Investigating a donor for infections is crucial for a graft processing and storage, as well as the indications for allograft use and the type of procedure in which it was applied.

Methods: We revised the records of 46 patients. Results: We used 09 patellar tendons, 09 anterior tibial tendons, 08 calcaneal tendons, 06 quadriceps tendons and 01 fibular tendon, mainly for multiple ligament reconstructions and ACL reviews. Conclusion: The use of allograft seems to be an interesting option for ligamentar reconstruction.

Keywords: Knee. Transplantation homologous. Anterior cruciate ligament. Tendon injuries.
Advantages of the use of allografts include: reduced surgical time, smaller incisions, availability of extensive grafts, absence of morbidity at donor site, and lower incidence of arthrofibrosis. But some disadvantages do exist, such as: tissue incorporation failure, longer graft incorporation time, enlarged bone tunnel, and, mainly, risk of contamination by viral and bacterial diseases.

All tendinous grafts - allografts or autografts - follow a timeline for tissue integration, starting with tissue necrosis, revascularization, cell repopulation and remodeling. After an autogenous implant, fibroblasts growth is seen during the first two months, with tissue maturation being observed after 10 months. On the other hand, allograft incorporation has been shown to occur slowly, both in humans and in animals. The process is significantly affected by the tissue sterilization and storage method, because this act on its biological incorporation properties.

The risk of viral diseases being transmitted after an appropriate selection of the donor is about 1:1 500 000, which is favorably comparable to the risk of transmission in blood transfusions, which is 1:600 000.

The objective of this study was to assess how allografts are being used for ligament reconstructions in our service.

**MATERIALS AND METHODS**

This investigation was a retrospective evaluation of 46 patients submitted to ligament reconstructions between 1999 and 2007 using tissues supplied by our Tissue Library as graft source for performing a surgical procedure. The retrospective analysis involved a review of the medical files, through which we have documented the procedure, the diagnosis at the time of surgery, as well as the kind of surgical procedure performed and which tissue was employed on each patient.

**RESULTS**

Thirty-four male patients and 12 female patients were reviewed, the 46 operated cases were followed up on an outpatient basis, with follow-up time ranging from 10 months to 9 years (mean: 3.1 years). (Figure 2)

The following grafts were employed:- Patellar tendon: 30 units.- Anterior tibial tendon: 9 units.- Calcaneus tendon: 8 units.- Quadriceps tendon: 6 units.- Fibular tendon: 1 unit. (Figure 3)
Indications for allografting were the following:

– Multiple ligament reconstructions: 20 patients (Figure 4) - 12 patellar tendon units, 4 anterior tibial tendon units, 7 calcaneus tendon units, 5 quadriceps tendon units, and 1 fibular tendon unit were used. (Figure 5)
– ACL reconstruction review: 14 patients - 8 patellar tendon units, 4 anterior tibial tendon units, 1 calcaneus tendon unit, and 1 quadriceps tendon unit were used. (Figure 6)
– Standalone reconstruction of the posterior cruciate ligament (PCL): 10 patients - 8 patellar tendon units, 1 anterior tibial tendon unit, and 1 fibular tendon unit were used. (Figure 7)

DISCUSSION

The use of tissues sourced by cadavers and stored on tissue libraries is an alternative for multiple ligament reconstructions, because it provides an appropriate source of grafts, without the morbidity usually associated to the removal of multiple autografts.12 In the posterior cruciate ligament reconstruction associated to posterolateral cantus reconstruction, in the ACL reconstruction associated to medial collateral ligament reconstruction, the use of allografts has been shown to provide good results.13-16 In our service, the main indication for allografting was multiple ligament reconstructions.

In ACL reconstruction review surgeries, the use of allografts is a good alternative, since it avoids the morbidity associated to the removal of further tissue on the injured side or, eventually, the need of removing tissue on the non-injured side. Results of ACL reconstruction reviews with allografting have been shown to be comparable to the use of autologous grafts.17

Viral and bacterial infection associated to the use of allografts is a very rare event.18 The risk of bacterial infection transmission...
through platelet concentration transfusion is 1:2172.\textsuperscript{19} The overall postoperative infection rate reported by nosocomial infection control centers in the United States ranges from 0.6\% to 2\%.

To date, we have found no viral transmission case. The bacterial infection rate among patients submitted to surgical procedures with the use of allografts is within our general incidence for nosocomial infection.\textsuperscript{20}

CONCLUSION

The use of allografts is a safe alternative, certainly providing less morbidity to surgical procedures, and must be considered particularly in multiple ligament reconstruction surgeries and reviews.

REFERENCES