Deleterious effect of sex mismatch between donor and recipient after Meniscus Allograft Transplantation . An analysis of the impact of donor and patients demographics on a series of 360 Meniscus Allograft Transplantations

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INTRODUCTION:
The use of meniscal allograft transplant (MAT) is increasing over time but the allograft availability is limited due to strict inclusion criteria for donation and patients matching. Moreover, in literature no studies have investigated the impact of allograft conservation time, demographic characteristics of the donor and the combination of donor and patients factors on the outcomes of MAT. The purpose of the study was to investigate the effect of graft freezing-time, demographical characteristics of the donor (age, sex, body mass index (BMI)) and the effect of mismatch of those demographical parameters between donor and patients on the survivorship of MAT.
METHODS: In this retrospective comparative study, 375 consecutive MAT procedures were performed in a single institution with soft tissue fixation technique between 2004 and 2021 and were screened and assessed for eligibility. Patients were included in the study in the presence of complete demographic data for both the donor and recipient and minimum 2 years of follow-up. Failure was defined as the need for graft removal for any reason (including infection, graft tear, total knee arthroplasty). Statistical analysis was performed via the Kaplan-Meier method to compare the graft survivorship based on the sex mismatch between the patients and the donor groups. A Receiver Operating Curve (ROC) was performed to evaluate the association of age, sex, BMI of the donor and difference between those parameters between the donor and the patients (Δage, Δsex, ΔBMI) with MAT failure.
RESULTS: A total of 360 patients at a mean 8.8±3.6 years fulfilled the inclusion criteria of the present study. Female patients who received a MAT from a male donor had a failure rate of 38.89%, which was significantly higher when compared with the other groups. The failure rate in the male-to-male group was 7.26%, while in the female-to-female group was 9.19%. The analysis performed on graft freezing time, age, sex and BMI of the donor as well as difference in age or BMI of the donor and patients did not find any association of those parameters with failure.
DISCUSSION AND CONCLUSION: The most important result of this study was the finding of a significant difference in survival from surgical failure in relation to sex concordance between donor and recipient in the context of MAT, an aspect never before highlighted in the literature.
Mismatch between donor and recipient sex had a negative effect on MAT survival only when a meniscus from a male donor was transplanted in a female patient. While age and BMI of the patients does not seem to affect the outcomes, the decision to transplant meniscus from a male donor should be carefully considered based on the results of the present study.