

Bridge-Enhanced Anterior Cruciate Ligament Restoration vs. Anterior Cruciate Ligament Reconstruction with Hamstring Autograft: A Discrete Choice Experiment

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INTRODUCTION: Anterior Cruciate Ligament (ACL) Repair with the Bridge-Enhanced Anterior Cruciate Ligament (ACL) Restoration (BEAR) implant has gained popularity recently due to low rates of reinjury and high rates of patient satisfaction among adolescent patients who participated in early clinical studies that compared BEAR with ACL Reconstruction (ACLR) with hamstring (HS) autograft. As with many new procedures, information available to patients in the popular press may not provide a comprehensive understanding of the potential risks and benefits of an emerging procedure. As a result, it is important to understand patient preferences based upon best available evidence to ensure clinical care remains patient centered. Therefore, the purpose of our study was to evaluate patient preference for BEAR when compared to ACLR with HS autograft when presented with best available evidence regarding the effect of both procedures on hamstring strength, rate of return to sport, risk of second injury, and potential risk of developing osteoarthritis. We hypothesized that there would be no difference in patient preferences nor patient demographics between procedure choice groups.

METHODS: Patients aged 18-30 years old who presented to a single institution in April-May 2023 with upper extremity complaints were included as study participants as a proxy for healthy controls. Patients with prior history of knee injury requiring surgical consultation were excluded. A discrete choice experiment was designed through literature review. Outcome measures such as hamstring strength, chance of return to sport within 1 year, risk of reinjury and additional surgery within 2 years, and risk of developing osteoarthritis in 10 years were used. The order of presented outcome measures was randomized for each participant. Included participants completed a custom survey in which they were asked to choose between surgery A (ACLR with HS autograft) and surgery B (BEAR). Frequencies for participant sex, work and sport involvement, and reasons for selecting their surgery of choice were calculated and then compared between groups using Fischer's exact tests. Patient-reported activity level, as measured by the Marx Activity Scale, was compared between groups using a Mann Whitney U test.

RESULTS: Seventy-three participants (35% female, 24.7±5.0 years of age, 53.4% play sports, 75.4% employed) completed the discrete choice survey. Sixty-five (89.0%, p<0.001) participants selected the BEAR procedure based on the information provided. There were no significant differences in sex (HS autograft = 37.5% female, BEAR = 35.1% female, p = 1.00), age (HS autograft = 25.4±4.7 years, BEAR = 24.5±5.2 years, p = 0.57), Marx score (HS autograft = 7.8±5.9, BEAR = 9.4±5.3, p = 0.34), sport participation (HS autograft = 43.8% play sports, BEAR = 56.1% play sports, p = 0.41), or employment status (HS autograft = 75.0% employed, BEAR = 75.4% employed, p = 0.948) based on procedure choice group. Figure 1 summarizes the frequency of responses to the items in the discrete choice survey and compares the distribution of responses between groups. Of the participants who selected BEAR as the better procedure, 96.5% indicated that they would choose to undergo this procedure if they had an ACL injury while 62.5% of patients who selected ACLR with HS autograft indicated that they would undergo the procedure in the same situation (p < 0.001).

DISCUSSION AND CONCLUSION: The vast majority of patients surveyed preferred to undergo BEAR over ACLR with HS autograft. While there were no significant differences between groups who chose BEAR and ACLR in terms of patient demographics, activity level, or employment status, patients in each group did rate each item on the discrete choice survey differently in terms of importance. While patients who chose BEAR appear to rate the risk of developing osteoarthritis, hamstring strength, and returning to sport as highly important, patients who chose ACLR with HS autograft appear to rate the risk of reinjury as more important. These results indicate that patients in each group have different preferences and goals that are not based on the aforementioned demographic variables. Providing patients with key points from the literature may better inform the decision-making process, particularly for emerging procedures such as BEAR, while also providing an opportunity to connect evidence-based and patient-centered care.

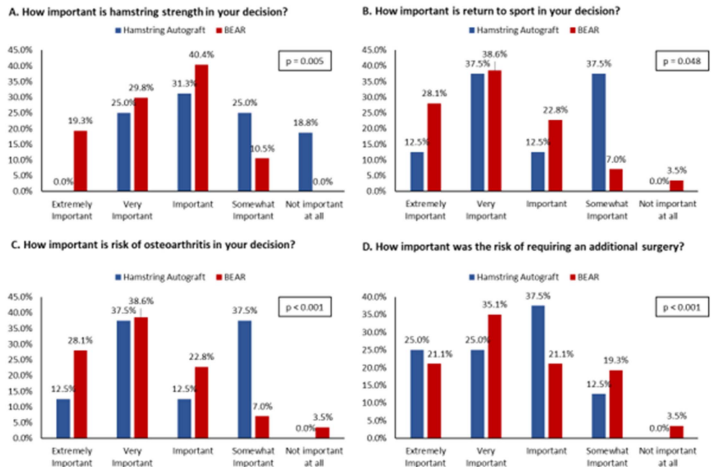


Figure 1. Descriptive statistics and between group comparisons for each item on the discrete choice survey based on selected procedure