

Acute Post-Operative Pain Following Anterior Cruciate Ligament

Reconstruction: A comparison of Patellar Tendon vs Hamstring Autograft

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INTRODUCTION

Anterior cruciate ligament (ACL) rupture is one of the most common injuries of the knee. Choosing between a bone-patellar tendon-bone (BTB) or hamstring tendon (HS) graft for primary ACL reconstruction has long been a topic of debate and discrepancy in orthopaedic literature, with many factors contributing to the decision process.

Post-operative pain is an important factor of consideration for surgeons and patients when deciding the most appropriate graft choice for ACL reconstruction. Discussion of post-operative pain following ACL reconstruction has generally focused on long-term outcomes, but information on acute postsurgical pain outcomes between BTB and HS remains limited.

OBJECTIVE

The purpose of this study is to analyze acute post-operative pain scores of patients who underwent ACL reconstruction and compare the results between BTB autograft and the HS autograft techniques.

METHODS

We retrospectively reviewed a sports medicine outcomes registry for all patients that had a primary ACL reconstruction between August 2014 and April 2017. All reconstructions were performed by a single surgeon and all reconstructions were done with either a BTB or HS autograft. Pain scores were collected for all patients preoperatively, at 3 weeks, 1 month, and 3 months. Patients were asked to rate their current pain on a 0-10 scale with 0 being no pain and 10 being maximum pain. Pain scores were compared using a Mann-Whitney Rank Test.

RESULTS

Pre-operative pain in the BTB group was 3.41 ± 2.04 and was not significantly different from pre-operative pain in the HS group (3.74 ± 2.32 , $P=0.439$). There was no difference in mean pain scores for BTB patients and hamstring patients at 2-week follow-up, 1-month follow-up, and 3-month follow-up (Table 2). Improvement in pain score from pre-operative to post-operative also did not vary between groups at any time point

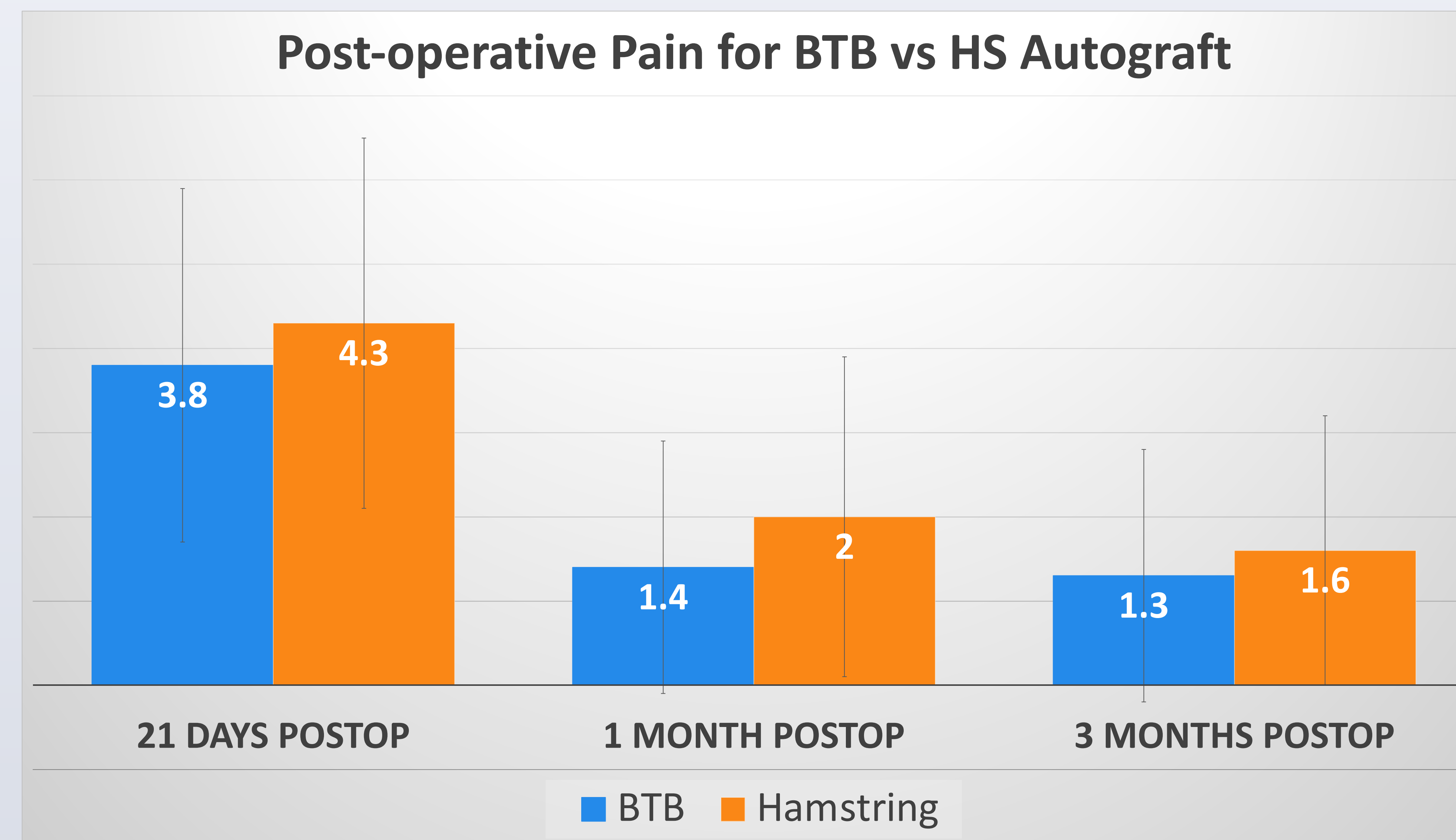


Figure 1: Graph comparing the acute post-operative pain scores of patients who underwent ACL reconstruction with BTB vs HS graft

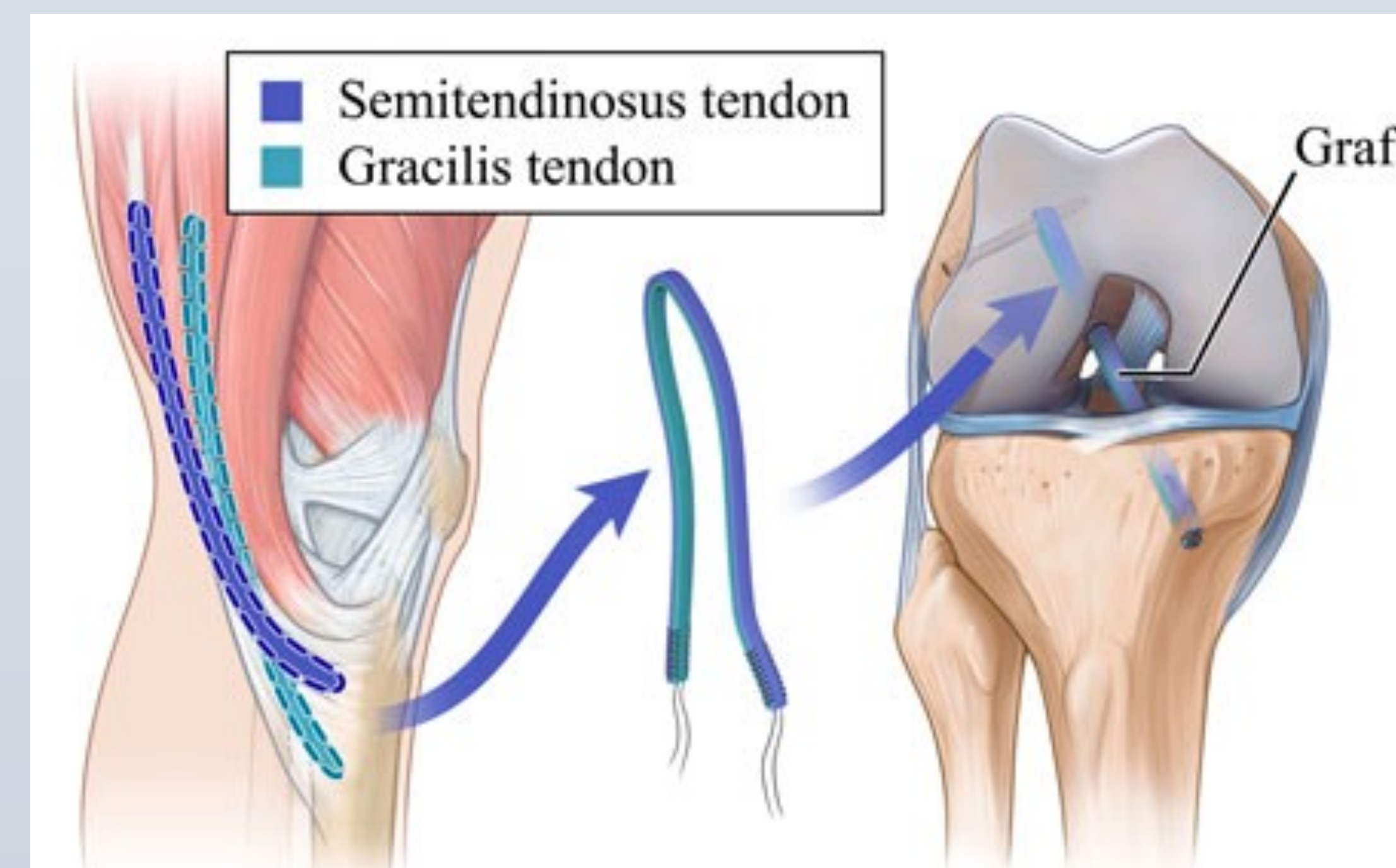


Figure 2: Illustration of HS autograft in ACL reconstruction



Figure 3: Illustration of BTB autograft in ACL reconstruction

CONCLUSION

There was no statistical difference found between the acute post-operative pain scores of the BTB autograft and the HS autograft cohorts. An HS autograft may be selected for some individuals undergoing ACL reconstruction based on alignment, personalized rehabilitation and activity demands among other reasons, but should not be selected on the perception of less pain in the acute post-operative period.

LIMITATIONS

The main limitation of this study is that there is a clear selection bias. The non-randomized nature of this study includes potential bias due to patients' input in choosing a graft type. The BTB group consisted of more males and the HS group consisted of more females. The BTB group consisted of younger patients generally with a higher level of activity.

REFERENCES

- Graft selection in anterior cruciate ligament reconstruction. *J Am Acad Orthop Surg.* 2005;13(3):197-207.
- Thaunat M, Fayard JM, Sonnery-Cottet B. Hamstring tendons or bone-patellar tendon-bone graft for anterior cruciate ligament reconstruction? *Orthop Traumatol Surg Res.* August 2018.
- Mohtadi NG, Chan DS, Dainty KN, Whelan DB. Patellar tendon versus hamstring tendon autograft for anterior cruciate ligament rupture in adults. *Cochrane database Syst Rev.* 2011;(9):CD005960.
- Corry IS, Webb JM, Clingeleffer AJ, Pinczewski LA. Arthroscopic reconstruction of the anterior cruciate ligament. A comparison of patellar tendon autograft and four-strand hamstring tendon autograft. *Am J Sports Med.* 1999;27(4):444-454.
- Feagin JAJ, Wills RP, Lambert KL, Mott HW, Cunningham RR. Anterior cruciate ligament reconstruction. Bone-patella tendon-bone versus semitendinosus anatomic reconstruction. *Clin Orthop Relat Res.* 1997;(341):69-72.
- Gupta R, Kapoor D, Kapoor L, et al. Immediate post-operative pain in anterior cruciate ligament reconstruction surgery with bone patellar tendon bone graft versus hamstring graft. *J Orthop Surg Res.* 2016;11(1):67.
- Yunes M, Richmond JC, Engels EA, Pinczewski LA. Patellar versus hamstring tendons in anterior cruciate ligament reconstruction: A meta-analysis. *Arthroscopy.* 2001;17(3):248-257.
- Anderson B. Sports Injury Info. Barton Anderson <http://www.sports-injury-info.com/acl-reconstruction-patellar-tendon-graft.html>. Accessed March 1, 2020.
- Staff H. Hamstring Graft for Anterior Cruciate Ligament Repair. Healthwise <https://www.healthlinkbc.ca/health-topics/abr6842>. Accessed March 1, 2020.