

Original article

Anterior Cruciate Ligament Reconstruction: A 2015 global perspective of the Magellan Society

Yee Han Dave Lee ^{a,*}, Ryosuke Kuroda ^b, Kai Ming Chan ^c

^a Department of Orthopedic Surgery, Changi General Hospital, Singapore

^b Department of Orthopedic Surgery, Kobe University Graduate School of Medicine, Kobe, Japan

^c Department of Orthopedics and Traumatology, The Chinese University of Hong Kong, Hong Kong SAR, China

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Abstract

Background/objective: The Magellan Society is composed of > 150 high-volume fellowship-trained sports surgeons from four continents. These surgeons represent their regional sports organisations in travelling fellowships and are considered to be opinion leaders in their respective organisations. Prior to the 2014 Magellan Meeting in Arima, Japan, a survey was conducted to understand how Magellan members perform anterior cruciate ligament (ACL) reconstruction. This study aims to better understand how ACL reconstruction is performed by sports surgeons worldwide and to determine differences in surgical practice.

Methods: A survey was conducted prior to the Magellan Meeting in Arima, Japan. Information on ACL graft of choice for primary surgery and revision surgery, preferred surgical techniques, and femoral and tibial graft fixation methods was collected. The incidence of meniscal tears and the management of injuries in ACL surgery were also studied. The results of the survey are discussed in this article.

Results: A response rate of 51% (72 member respondents) was achieved for this survey. Hamstring autograft (58%) was the graft of choice for primary ACL reconstruction. The next most common autograft used was bone patella tendon bone autograft (28%). Allograft was the graft of choice in only 4% of respondents. The region of origin of surgeons and the age of surgeons were factors in the ACL graft of choice. Seventy-five percent of surgeons practised single-bundle ACL reconstructions only, 22% performed both single-bundle and double-bundle ACL reconstructions, and 3% performed double-bundle ACL reconstructions exclusively. Sixty-two percent of the respondents drilled femoral tunnels using the anteromedial portal technique. Meniscus repairs were performed in 25% of ACL reconstructions, on average.

Conclusion: Based on the survey, hamstring transportal anatomic single-bundle ACL reconstruction with meniscus preservation is the preferred ACL reconstruction technique of high-volume fellowship-trained sports surgeons.

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Keywords: ACL; anatomic reconstruction; survey

Introduction

Practitioners' understanding of anterior cruciate ligament (ACL) anatomy and knee kinematics has made anatomic ACL reconstruction the standard of care among sports knee surgeons. The Magellan Society, a group of > 150 sports

surgeons from four continents (North America, Europe, Asia Pacific, and South America), organised a biannual meeting in Arima, Japan, in April 2014. All surgeons in this group were members of the American Orthopedic Society for Sports Medicine; the European Society for Sports Traumatology, Knee Surgery, and Arthroscopy; the Asia-Pacific Knee, Arthroscopy and Sports Medicine Society; and the Latin American Society of Knee Arthroscopy and Sports Medicine who have participated in cross-continent travelling fellowships between member organisations.

* Corresponding author. Changi General Hospital, 2 Simei Street 3, 529889, Singapore.

E-mail address: Dave_Lee@cgh.com.sg (Y.H.D. Lee).

We prepared a questionnaire to “poll” the opinions of Magellan members on the current practice of ACL surgery to facilitate a discussion of the current state of ACL reconstruction during the meeting. This survey allowed the sports surgeons to share their experiences and to contrast practice behaviours in different regions. The findings from this survey and the discussions in the meeting are presented in this article.

Materials and methods

A survey form was sent out to all 150 surgeons through the Magellan Society Secretariat. The questions dealt with ACL graft of choice, surgical technique, graft fixation, revision ACL graft of choice, rehabilitation protocol after surgery, percentage of concomitant meniscal injuries, and percentage of meniscus repairs.

The questions included the following. (1) Primary ACL graft of choice: (i). autograft (hamstring, bone patella tendon bone [BTB], and quadriceps tendon) and (b) allograft. (2) ACL surgical technique: (i) single-bundle ACL reconstruction, (ii) double-bundle ACL reconstruction, and (iii) both single-bundle and double-bundle ACL reconstructions. (3) ACL femoral tunnel drilling method: (i) anteromedial portal, (ii) transtibial, and (iii) outside-in. (4) ACL graft fixation method: (i) femoral fixation and (ii) tibial fixation. (5) Use of ACL backup tibial fixation. (6) Revision ACL graft of choice. (7) Rehabilitation time frame after ACL reconstruction: (i) when patients were allowed jogging, (ii) when patients were allowed side-to-side training, and (iii) when patients were allowed to return to competition. (8) Percentage of meniscal injuries and meniscus repairs performed in ACL reconstruction. (9) Percentage of bucket-handle meniscal tears repaired.

We collated the survey results and summarised them in the figures and tables. Test of significance was performed on various variables using Fisher's exact test.

Seventy-two replies were received, representing a 51% response rate. The breakdown of survey respondents by continent was as follows: North America (American Orthopedic Society for Sports Medicine), $n = 30$; Europe (European Society for Sports Traumatology, Knee Surgery, and Arthroscopy), $n = 24$; Asia Pacific (Asia-Pacific Knee, Arthroscopy, and Sports Medicine Society), $n = 15$; and South America (Latin American Society of Knee Arthroscopy and Sports Medicine), $n = 3$.

Figure 1 presents the regions of origin of the respondents. The replies came from the United States, Canada, Germany, Switzerland, United Kingdom, Italy, France, Austria, Belgium, Greece, Croatia, Spain, Australia, New Zealand, China, Hong Kong, Japan, Taiwan, Singapore, Philippines, Chile, and Argentina.

The mean age of survey respondents was 51 years (range, 36–72 years). The mean number of ACL reconstruction cases performed per year was 130 (range, 20–400), and the mean number of revision ACL cases performed per year was 22 (range, 3–80).

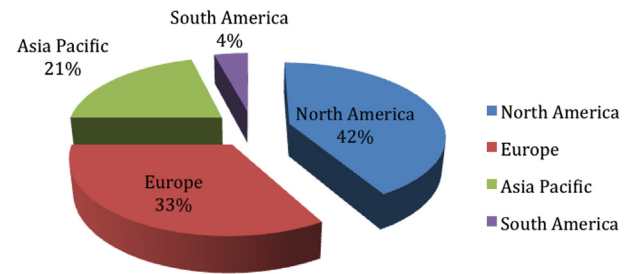


Figure 1. Survey respondents by region of origin.

Results

Primary ACL graft of choice

Hamstring autograft was the most common graft of choice amongst the respondents [42 surgeons (58.3%)], whereas BTB autograft was the second most common (20 surgeons). Allograft was the graft of choice for primary ACL reconstruction in only 4% (3 surgeons) of the respondents. Figure 2 presents the primary ACL grafts of choice of the respondents.

Surgeons' region of practice influenced their graft of choice. The graft of choice among surgeons in Asia Pacific was hamstring autograft. Figure 3 presents the ACL grafts of choice by region.

Younger surgeons (<50 years) worldwide were more likely to indicate hamstring autograft as their ACL graft of choice ($p = 0.01$). The younger North American surgeons (<50 years) preferred hamstring autograft, but this trend did not reach statistical significance. The younger European surgeons were more likely to use hamstring autograft than BTB autograft as ACL graft ($p = 0.024$).

Revision ACL graft of choice

Revision ACL graft of choice was strongly dependent on the first graft. Patients who had hamstring ACL reconstruction would most likely have BTB autograft as the revision ACL graft of choice, and vice versa.

Eighty-two percent of surgeons preferred autograft for revision ACL surgery. Twelve surgeons (18%) indicated allograft tissue as their graft of choice for revision ACL surgery. Figure 4 presents this breakdown.

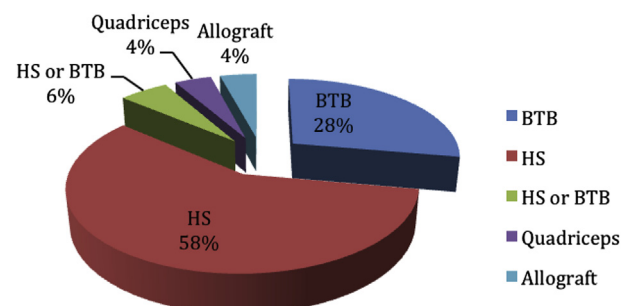


Figure 2. Graft of choice for primary anterior cruciate ligament reconstruction. BTB = bone patella tendon bone; HS = hamstring.

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