BMI increases after ACL-reconstruction in Adolescents

Regina Hanstein 1, Noah Kirschner 2, Christine Moloney 1, Eric D. Fornari 1
1 Division of Pediatric Orthopaedics, Children’s Hospital at Montefiore Medical Center, Bronx, NY
2 Albert Einstein College of Medicine, Bronx, NY

The incidence of ACL injuries in the pediatric and adolescent patient population has increased over the last 20 years. ACL reconstruction is recommended to avoid osteoarthritis later in life. However, a 6-12 months rehabilitation with no or limited sports activity after surgery is required to protect the graft and graft fixation.

Aims: Determine, if the period of inactivity after ACL-reconstruction surgery affects the BMI in an adolescent patient population and affects patient self-reported outcomes.

Methods: Study Design: retrospective review
Study Population: Patients 1-21 years of age, who underwent ACL reconstruction surgery by one of two pediatric orthopedic surgeons between 2013 and July 2018 and had height and weight recorded pre-operatively and during the post-operative period.

Of 131 Subjects with a min. follow-up of 6 months after ACL-reconstruction, 86 met inclusion criteria.

Demographic Parameters Mean (±SD) or N (%)  
Age, years 16.3 ± 1.9 (range, 7 to 21)  
Sex, Female 36% (37.5%)  
BMI, BMI% and Z value 26.4 ± 6 (range, 18.3-36.1)  
Follow-up, years 1.7 ± 1.1  
Surgical Parameters N (%)  
Laterality, R 56 (38.3%)  
ACL, Grade  
Hamstring 55.8%  
Patellar tendon 44.2%  
Associated Ligament injury, yes 65 (48.4%)  

Patient self-report outcomes:  
Pedi-IKDC Subjective Knee Evaluation Form (The Pediatric International Knee Documentation Committee)  
Tegner Lysholm Knee Scoring Scale (Lysholm Knee Questionnaire / Tegner Activity Scale)  
KOOS-Child (Knee and Osteoarthritis Outcome Score for Children)  

Statistics: Continuous variables were analyzed using paired t-test, Wilcoxon rank sum test and Spearman correlation.

1 – BMI changes after ACL reconstruction

Comparison of BMI, BMI-for-age percentile and Z-score before and after ACL reconstruction.

Table: BMI-for-age percentile (BMI%) and Z-score were not significantly different at any timepoint after ACL reconstruction.

A: BMI did not change at 6 months after ACL reconstruction, but was significantly higher at 1 year post ACL reconstruction and at most recent F/U compared to BMI at initial surgery (* p<0.05).

B: Sub-analysis by gender revealed that males had a higher BMI at 6 months, 1 year and most recent F/U (B), whereas BMI of females only increased at most recent F/U, not at any other timepoint (C) (* p<0.05).

CONCLUSION

A: Before ACL reconstruction, 35% of males were obese, which increased to 44% 6 months after surgery. At most recent follow-up, 75% of males were overweight or obese compared to 55% pre-operatively.

B: Females 58% of females were overweight or obese before surgery, at most recent follow-up 52% of females were overweight or obese.

2 – Distribution of Overweight and Obesity

CONTACT: Eric D. Fornari, efornari@montefiore.org