Long Term Follow up of Pediatric ACL Reconstruction in New York State: High Rates of Subsequent ACL Reconstruction and Additional Knee Surgery Following Pediatric ACL Reconstruction

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INTRODUCTION

- ACL reconstruction rates have increased dramatically in New York state over the past 20 years (Fig. 1).  
- Increasing sports participation among pediatric population.  
- Children are beginning sports at younger ages, playing for longer durations, with greater intensity and concentrating on a single sport year round.  
- Peak age for ACL reconstruction is 17 years.  
- ~1/500 17 year olds undergoes ACL reconstruction in NY state.

METHODS

- Statewide Planning and Research Cooperative System (SPARCS) database, containing all inpatient and outpatient surgeries in New York State.  
- Inclusion criteria: age 3-20 inclusive, primary ACL reconstruction from1997-2010 in New York State.  
- ACL and non-ACL knee surgeries were identified using CPT and ICD-9 procedure codes.  
- Patients were tracked for return to the operating room for subsequent ACL reconstruction and non-ACL knee surgery with a minimum follow up of one year.  
- Survival analysis: time to subsequent surgery, adjusting for age, sex, race, comorbidity index, insurance type, surgeon and hospital ACL volume, poverty prevalence, and surgeon specialty.

RESULTS

- 23,912 primary pediatric ACL reconstructions identified  
- 1,956 surgeries (8%) subsequent ACL reconstructions (Fig. 2).  
- 3,341 surgeries (14%) subsequent non-ACL knee procedures (Fig. 2).  
- Median follow up 6.7 years (IQR 3.3 – 10.7 years).  
- Median time to subsequent ACL reconstruction 1.5 years (IQR 0.9- 3.1 years).  
- Median time to subsequent non-ACL knee surgery 1.4 years (IQR 0.7- 2.8 years).

CONCLUSIONS

Discussion:

- Risk factors for subsequent ACL reconstruction include younger age, male sex, white race, private insurance, and higher hospital and surgeon ACL volume.  
- Risk factors for additional non-ACL knee surgery include younger age, female sex, white race, private insurance, and higher hospital ACL volume.  
- Younger children that get ACL tears may participate in greater/more at-risk activities—could reconstruction be inherently less reliable with techniques used for open physes, explaining further increased rates in younger children?  
- Racial and insurance differences likely represent a disparity in access to care for lower socioeconomic patients.  
- Higher volume hospitals/surgeons were associated with greater subsequent ACL surgery rates—could this be due to more competitive athletes (more at risk of tearing native and reconstructed ACLs) seeking a more established hospital/surgeon?

Limitations:

- Data not sufficiently detailed to determine side of operation.  
- In some cases subsequent surgery is a revision ACL surgery and other times a primary ACL reconstruction to contralateral leg.  
- Information on graft type or technique of reconstruction not available in database.

Conclusions:

- This is one of largest studies documenting surgery rates after primary ACL reconstruction in children.  
- However, relationships reported are associations only, and further research is required to confirm causative factors leading to subsequent surgery.

REFERENCES