Adults Undergoing Posterior Cruciate Ligament Reconstruction Have More Concomitant Multiligamentous Injury but Similar Failure Rates Compared with Adolescents

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Disclosure Statement

The authors have no conflicts of interest to disclose

Epidemiology

- Posterior cruciate ligament (PCL) tears comprise 3% of outpatient knee injuries[1]
- Rarely occur in isolation → up to 95% of tears in combination with other ligament tears[2]
- Untreated PCL injury increases rates of morbidity, pain, and development of degenerative joint disease[3,4]

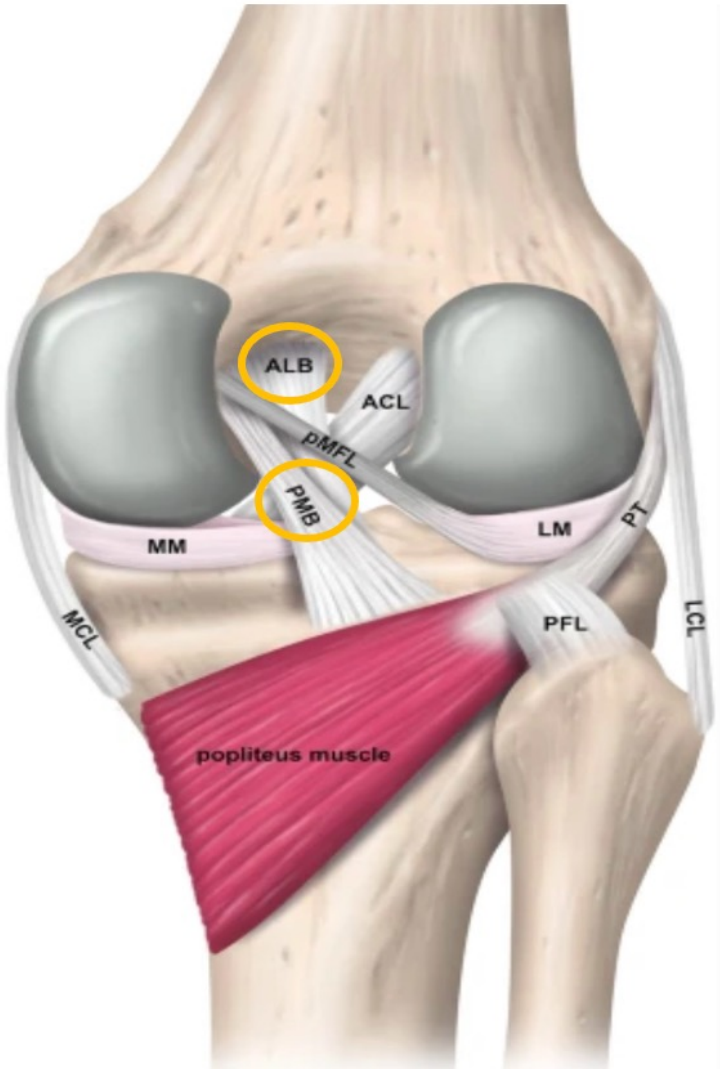

Image adapted from Winkler et al [5]. Circled in yellow are the anterolateral (ALB) and posteromedial (PMB) bundles of the PCL

Purpose

- Typical mechanisms of injury include sporting activities and higher energy injuries (i.e motor vehicle accidents)

- As younger individuals continue to participate more in sporting activities, questions regarding utility of PCL-reconstruction (PCL-R)

- Known increased failure after anterior cruciate ligament reconstruction (ACLR) in younger cohorts[6] → <u>same trend for PCL-R?</u>

- **Objective:** Compare the epidemiology, pathology, and outcomes of PCL-R in adults and adolescents

- **Hypothesis:** Differences would exist between adults and adolescents in failure rates and patient reported outcomes (PROs) following PCL-R

Methods

- Single institution retrospective cohort study
- Inclusion criteria: PCL-R after **complete** rupture
- Two groups:
  - Adolescents: 10-19 years of age
  - Adults: >19 years of age
- Exclusion Criteria: PCL repair, incomplete tear, nonoperative treatment, insufficient data

Methods

- Comparison of:
  - Concomitant ligamentous/meniscal injury
  - Cartilage injury
    - Location
    - Grade – International Cartilage Repair Society (ICRS) Classification)[7]
- Patient reported outcomes
  - Visual Analog Score (VAS)
  - International Knee Documentation Committee Subjective knee form (IKDC SKF)
  - Tegner Activity Level
  - Lysholm Score
  - Knee Injury and Osteoarthritis Outcome Score (KOOS)

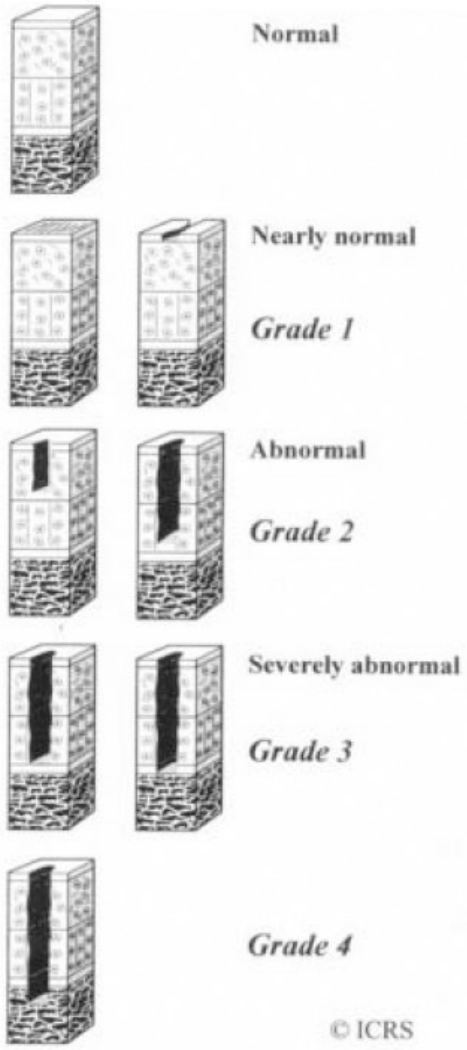

Image courtesy of Årøen et al[7]

Baseline Characteristics

BMI: Adult > Adolescent

Follow up: Adolescent > Adult

Time to Surgery: Adult > Adolescent

	Adolescent (n = 21)	Adult (n = 55)	p-value
Age (years)	16.7 [1.3]	55 [32.7]	--
Sex (Female)	10 (48%)	14 (25%)	ns
BMI (kg/m²)	27.2 [6.9]	32.4 [8.0]	**0.01**
Follow up (years)	7 [3.5]	5.2 [3.1]	**0.03**
Time to surgery (weeks)	20.6 [17.4]	77.6 [144.0]	**0.01**
Sport			
Contact	10 (48%)	10 (18%)	ns
Noncontact	3 (14%)	10 (18%)	
Unknown	8 (38%)	35 (64%)	
Injury Mechanism			
Sport	11 (52%)	17 (31%)	ns
MVA	5 (24%)	23 (42%)	
Fall	2 (10%)	10 (18%)	
Other	3 (14%)	5 (9.1%)	

No significant differences in sport participation or injury mechanism

Cartilage involvement

	Adolescent (n = 21)	Adult (n = 55)	p-value
Cartilage Injury Location			
Patellofemoral	1 (5%)	14 (25%)	**0.05**
Trochlea	1 (5%)	9 (16%)	ns
Medial Femoral Condyle	4(19%)	20 (36%)	ns
Medial Tibial Plateau	3 (14%)	16 (29%)	ns
Lateral Femoral Condyle	3 (14%)	10 (18%)	ns
Lateral Tibial Plateau	(24%)	12 (22%)	ns

Patellofemoral cartilage involvement: 5x greater rate in adults

Concomitant Injury and PROs

- ACL → Adult > adolescent (56% v 24%, **p = 0.01)**
- All medial meniscal tears → adolescent > adult **(p = 0.04)**
- No difference
  - Lateral meniscus
  - Medial collateral ligament/posteromedial corner
  - Lateral collateral ligament/posterolateral complex
- No significant differences in:
  - PROs
  - Return to sport
  - Postoperative outcomes

Discussion/Conclusion

- Similar outcomes post PCL-R between adults and adolescents

- More concomitant pathology in the adult knee
  - ACL injury
  - Medial meniscal injury
  - Patellofemoral cartilage damage

- Future studies:
  - Increase sample size
  - Predictive risk factors of differing injury patterns
  - Role of earlier intervention on outcomes within adult population

Thank you!

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