Failure Rates & Functional Outcomes
Allograft/Autograft BPTB ACL Reconstruction
In Patients <30 Years of Age

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12th Biennial ISAKOS Congress
May 12-16, 2019
Cancun, Mexico
Disclosures
May 2019

➢ No relevant financial disclosures.
### 1. Allograft BPTB ACLR <30 Years

**What We Thought We Knew?**

**Meta-Analyses Are Inconclusive - Functional Outcomes**

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<tr>
<th>Allograft Worse Functional Outcomes</th>
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**Functional Questionnaires or Sport Tests**

Allograft BPTB ACLR <30 Years
What We Thought We Knew?
Meta-Analyses Are Inconclusive - Laxity

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<th>Allograft Increased Knee Laxity</th>
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# Allograft BPTB ACLR <30 Years

## What We Thought We Knew?

Despite numerous studies, meta-analyses have been inconclusive regarding the re-rupture rate of allograft versus autograft ACL reconstruction. Here is a summary of key findings from various studies:

**Allograft Increased Re-Rupture Rate**

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**Autograft & Allograft Equal Re-Rupture Rate**

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Allograft BPTB ACLR <30 Years
What We Now Really Know - 2018
The Big Question

➢ Our Purpose

◆ Investigate Differences in Clinical Outcomes in Our Series

✓ BPTB Autograft vs Allograft Reconstruction
  • Patients >17 and <30 Years

➢ Do We Really Know the Answer Today?
Allograft BPTB ACLR <30 Years
Methodology

Inclusion/Exclusion Criteria

- **Cohort Study - Single Surgeon (KDP)**
  - Follow-Up >2 Years (Range 3 -14.9 Years)
  - Autograft BPTB - 35 Patients
  - Allograft BPTB - 13 Patients
    - LifeNet (Virginia Beach, VA, USA)/
    - MTF (Edison, NJ, USA)
- **Exclusion Criteria**
  - Age - Patients <16 Years & >31 Years
  - Revision Surgery
  - Osteochondral Grafting
  - Multiligamentous Injuries
- **Outcome Questionnaires**
  - Lysholm, IKDC, Tegner
- **Physical Examination**
  - Range of Motion
  - Ligamentous Testing
    - Lachman/Pivot Shift
  - KT1000 Arthrometer
    - 15 lbs, 20 lbs, 30 lbs, Manual Max
- **Pre/Post Op Imaging**
  - Plain Radiographs, MRI, CT Scan

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Allograft BPTB ACLR <30 Years
Surgical Technique
Transtibial with Anteromedial Portal

- **Patella Tendon**
  - Autograft (10mm Tendon)
    - Cancellous Bone Graft
  - 1/3 Thickness Closure

- **Allograft Source**
  - <40 Years of Age (14mm Tendon)
    - 5 Years Younger Than Patient Age

- **Bioabsorbable Interference Screw (Linvatec, Largo, FL)**
  - Poly L-lactic acid
  - Femur 8x20
  - Tibia 9x20 or 9x25

- **Meniscal Repair**
  - All-Inside - Smith/Nephew
  - Inside-Out - Linvatec
    - Zone Specific Cannula

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Allograft BPTB ACLR <30 Years
Postoperative Rehabilitation Protocol
All Patients Conservative

- Decelerated Rehab Program
  - Bone Tunnel Enlargement Avoided
    - Increased Seen With Accelerated, Brace Free, Rehab in Hamstring Autograft ACLR\(^1\)-\(^2\)
- CPM for Home - 2-3 Weeks- No Evidence
- Cryotherapy\(^3\) - Evidence Confirmed
- Brace Utilized-No Evidence
  - Post Op Knee Brace
    - 6 Weeks
      - Locked 10-90°
  - ACL Sport Specific Brace\(^8\)
    - 6-12 Weeks Post Op
- Supervised Physical Therapy\(^4\)-\(^5\)
  - Brace Wear at 5 Months
    - Allograft and Autograft
- Cutting/Pivoting Sports
  - Adequate Proprioception
  - Never Less Than 6 Months\(^7\)
  - Sport Test - Return to Sport\(^6\)

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Allograft BPTB ACLR <30 Years
Definition and Results

Graft Rupture/ Functional Performance

- **Age at Surgery - Comparable** (p=0.187)
  - Autograft - 22.0 ± 4.4 yrs
  - Allograft - 23.8 ± 3.9 yrs

- **Follow-Up Comparable** (p=0.155)
  - Autograft - 8.7 ± 5.2 yrs
  - Allograft - 6.7 ± 3.7 yrs

- **Overall Failure Rate 2.1% (N=1)**
  - Allograft - 0%
  - Autograft - 2.9% (N=1)
    - 4 Years Post Op
      - Revision BPTB Autograft
        - By Another Surgeon
        - Young Female-Ski Trauma
          - 15 Years Ago

- **No Significant Difference Between Allograft/Autograft** (p=0.324)

- **No Difference in Clinical Outcomes**
  - Lysholm (p=0.380)
  - IKDC (p=0.324)
  - Tegner (p=0.365)
Allograft BPTB ACLR <30 Years
Outcomes

Return to Sport - Contact & NonContact

- All Patients Returned to Preop Sport Level
  - Tegner >6 (Range 6-10)

- Allograft
  - Contact Sports
    - Soccer - 31%
    - Basketball - 8%
    - Lacrosse - 8%
  - Limited/Non Contact Sports
    - Skiing/Snowboarding - 38%
    - Running - 23%
    - Gymnastics - 8%
    - Baseball/Softball - 31%

- Autograft
  - Contact Sports
    - Soccer - 9%
    - Basketball - 23%
    - Lacrosse - 16%
    - Football - 14%
  - Limited/Non Contact Sports
    - Skiing/Snowboarding - 17%
    - Running - 11%
    - Gymnastics - 2%
    - Baseball/Softball - 23%
    - Tennis - 11%
Allograft BPTB ACLR <30 Years

Outcomes

Laxity

- No Significant Difference
  - AUTOgraft vs. ALLOGraft
    - KT-1000
      - 30 Lbs p=0.997
      - Manual Maximum p=0.747
      - Side-to-Side Difference
        - 30 lbs p=0.402
        - Manual Max p=0.5.84
    - Pivot Shift
      - Negative
        - Auto N=33
        - Allo N=10
      - Positive Glide
        - Auto N=2
        - Allo N=1
      - Positive Clunk
        - Auto N=0
        - Allo N=2
    - Lachman
      - Negative
        - Auto N=34
        - Allo N=10
      - Nearly Normal (3-5mm)
        - Auto N=1
        - Allo N=2
      - Abnormal (6-10mm)
        - Auto N=0
        - Allo N=1
  
Significance p<0.05
Allograft BPTB ACLR <30 Years

Summary

Conclusions - Mid-Term Results

- Allograft BPTB ACLR Excellent Option in Patients <30 Years Old
  - Equal Results Compared to Autograft ACLR
    - Complications Not Seen
      - No Infections/Osteolysis
      - No Laxity
      - No Arthritis Seen Yet
    - Long Term Return to Sporting Activities
    - Anatomical Restoration
  - Graft Matters
    - Non-Irradiated or <2.2 Mrad
    - Allograft Age <40 Years
      - Always 5 Years Less Than Patient Age