Anterior Cruciate Ligament with Bone Patellar Tendon Bone Technique Does Not Cause Functional Anterior Knee Pain

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Disclosure

• All authors have no relevant disclosures
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Introduction

• Anterior Cruciate Ligament (ACL) rupture is one of the most common injuries in orthopaedics
  • Most common ligament injury
  • Estimated Incidence: 81/100,000 persons

• Common in:
  • Running, jumping, cutting, pivoting
  • Female : Male = 2-4:1

• Treatment
  • Conservative
  • ACL reconstruction
Introduction

Bone Patellar Tendon Bone (BPTB)
• Gold Standard
• Pro:
  • Faster and stronger incorporation
    • Bone-to-bone healing
  • Rigid fixation
  • Superior Lachman
  • Greater return to sport
• Con:
  • Anterior knee pain
  • Patella fracture

Hamstring
• Pro:
  • Strongest
  • Smaller/fewer incisions
  • Lower risk anterior knee pain
  • Lower risk DJD
• Con:
  • Hamstring weakness
  • Graft laxity
    • Soft tissue fixation
Introduction: Anterior Knee Pain

• BPTB:
  • Donor site origin / scar tissue formation
    • Kartus et al: 40-60% BPTB patients have donor site morbidity
  • Xie et al: Meta analysis:
    • Anterior knee pain 1.71x higher BPTB (p<0.01); kneeling pain 2.05x higher (p<0.01)

• Hamstring:
  • Kanamoto et al: 6 month follow up of 57 hamstring ACL reconstructions
    • 56.1% with anterior knee pain
Purpose

To investigate if ACL reconstruction with BPTB autograft results in functional anterior knee pain

Hypothesis

ACL reconstruction with BPTP autograft does not cause functional anterior knee pain

Functional = activity limiting
Methods
• IRB approved retrospective review
• BPTB ALC reconstruction 3/2013 – 5/2017
  • Minimum 1 year follow up
• Outcomes:
  • Pain: Visual Analogue Scale (VAS)
  • Presence vs absence anterior knee pain
  • Range of motion (ROM)
• Data:
  • Pre-operative
  • Post-operative: 2wk, 6wk, 3mo, 6mo, 1yr

• 130 patients with BPTB ACL reconstruction and >1yr follow up

<table>
<thead>
<tr>
<th>Demographics</th>
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<tbody>
<tr>
<td>Male (%)</td>
<td>76 (58.5%)</td>
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<tr>
<td>Female (%)</td>
<td>54 (41.5%)</td>
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<tr>
<td>BMI (range)</td>
<td>26.5 (18.6 – 47.1) kg/m²</td>
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<tr>
<td>Age (range)</td>
<td>26.7 (13 – 75) years</td>
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</tbody>
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Results: VAS Pain and ROM

![Graph of VAS Pain Score](image1)

![Graph of Range of Motion Arc](image2)
Results: Anterior Knee Pain

Patients with Anterior Knee Pain

NUMBER OF PATIENTS

WEEKS POST-OPERATIVE

Number of Patients
Percentage of Patients
Results: Anterior Knee Pain

Persistence of Anterior Knee Pain

- Pain at 2wks
- Pain at 6wks
- Pain at 3mos
- Pain at 6mos
- Pain at 1yr
Discussion

• Niki et al: 56 BPTB vs 71 semitendinosus vs 44 semitendinosus + gracilis
  • Anterior knee pain:
    • 3 month: 42.0% overall, significantly greater in BPTB (p=0.001)
    • Predisposition: knee extension deficit (OR 2.76, p=0.004)
    • 2 year: 11.1% overall, no difference between graft options
      • 95% of which also reported anterior knee pain at 3 months

• Feller et al: 31 BPTB vs 34 Hamstring autografts (randomized)
  • BPTB with more anterior knee pain (97% vs 68% p<0.01) at 2 weeks
    • Non-significant discrepancy at 8 weeks (87% vs 77%) or 4 months (81% vs 70%)
    • High incidence of anterior knee pain
  • Pain levels (2.8-5.0 on VAS) no clinically different
Conclusion

• BPTB is effective for reducing pain in patients with ACL tears

• BPTB has low incidence of anterior knee pain
  • Peak of 10% at 6 months post operatively

• 92.3% resolution of anterior knee pain between 6 months and 1 year post-operative
References


