No Difference in Clinical Outcomes, Revision Rates, and Sports Participation Between Hamstring and Quadriceps Tendon Autografts for ACL Reconstruction in Pediatric and Adolescent Patients

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ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Disclosure

Nothing to disclose

Background

- ACL injuries in young athletes (aged ≤ 18 years) are common.
- Hamstring graft (HT) has been widely used but has concerns of graft failure when perform (in isolation) for at-risk young athletes .
- Quadriceps tendon (QT) is emerging as an alternative due to biomechanical advantages and lower donor site morbidity.
- However, no consensus regarding the graft choice for ACLR in these young patients.
- Objective: To determine whether QT provides superior outcomes.

Purpose/ Hypothesis

- Purpose: To compare HT and QT autografts for ACLR in young athletes in terms of patient-reported functional outcomes (PROMs), knee stability, graft failure rates and sports participation after ACLR.

- Hypothesis: QT provides better function, higher return-to-sports rates, and lower revision rates compared to HT autograft

Methodology

- **Inclusion**:

Age ≤ 18 years, Primary ACL using HT or QT autograft.

- **Exclusion**:

Revision ACL, other graft types, PCL injuries, contralateral knee injuries.

- **Outcome Measures**:

Lysholm score, Tegner activity, VAS pain, Knee stability (Lachman and pivot shift test), Graft failure, Return to sports.

Results

- Total Patients: 157 (HT: 77, QT: 80).
- Baseline Comparison: No significant differences in age, gender, or concomitant injuries ($p>0.05$).
- No significant difference in pre-injury activity levels between the groups.

Results..

At 2-Year Follow-Up:

- No significant differences in Lysholm, Tegner, or VAS pain scores ($p>0.05$) between two groups.
- Lysholm, Tegner and VAS score improved to pre-injury level in both the groups
- No significant differences in knee stability (Lachman, Pivot Shift).
- No significant disparity in return to sports ($p>0.05$).

Graft failure

- HT Group: 11 patients (14%) failed.
- QT Group: 8 patients (10%) failed.
- No significant difference ($p>0.05$)
- QT is not inferior to HT in durability.

Discussion

- Literature Gap on QT in Adolescents: Limited studies on QT grafts in pediatric ACL reconstruction, current findings align with existing data.

- Need for Future Research: A high-quality, multi-center RCT with larger sample size and longer follow-up is required.

Limitations

- Study focused PROM’s and there were no objective scores.
- Small size leads to limited and underpowered statistical analysis. (for graft failure)
- Follow-up was short
- The selection of the graft was not randomized

Conclusion

- No differences in functional outcomes, graft failure rates, or return to sports between QT and HT.
- QT is a safe and viable alternative to HT.
- Surgeons should consider QT as an option for young athletes.
- Multi-center trials & long-term follow-up needed.

References

- Frosch et al., 2020 – QT grafts show lower donor-site morbidity and comparable outcomes to HT grafts.
- Micheli et al., 2019 – Growth disturbances are rare with both grafts, but QT may reduce risk.
- Cordasco et al., 2021 – QT grafts exhibit superior graft size and biomechanical properties.
- Lawrence et al., 2020 – HT grafts lead to slight hamstring weakness postoperatively.
- Kay et al., 2019 – QT grafts may have lower rerupture rates in high-demand athletes.
- Krych et al., 2021 – HT grafts show greater laxity in long-term follow-up.
- Guzzanti et al., 2018 – QT grafts have better integration and healing in pediatric patients.
- Shaw et al., 2020 – No significant differences in functional outcomes between HT and QT.
- Fabricant et al., 2022 – QT grafts provide higher patient-reported satisfaction.
- Kocher et al., 2019 – Revision rates comparable, but QT grafts may be preferred in younger athletes.