Tourniquet Use During ACL Reconstruction Is Associated With Postoperative Quadriceps Atrophy and Pain but No Negative Effects in the Long Term: A Systematic Review

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Disclosures

Aaron Casp - American Orthopaedic Society for Sports Medicine: Board or committee member, Stryker: Paid consultant

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Background

- Pneumatic tourniquets are utilized during anterior cruciate ligament reconstruction (ACLR) to improve intraoperative visualization, decrease operative time, and reduce intraoperative blood loss.
- Tourniquet use has been associated with decreased leg strength, increased pain, increased postoperative blood loss, skin damage, and neurologic injury.
- Studies have conflicting results regarding the use of a tourniquet during ACLR.

Purpose

To evaluate the effect of tourniquet use during ACL reconstruction on quadriceps strength, intraoperative and postoperative blood loss, operative time, thigh girth or calf girth, and postoperative pain.

Hypothesis

The use of a tourniquet will decrease quadriceps strength in the immediate postoperative period and will return to baseline long-term, and that changes in secondary outcomes will vary with the use of a tourniquet.

Methods

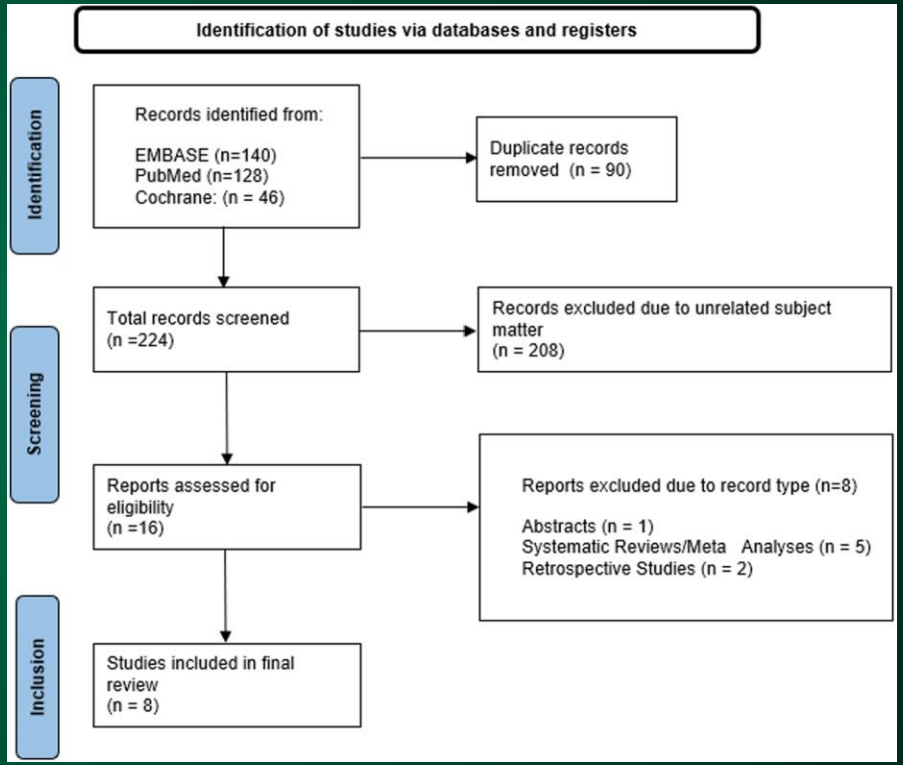
This systematic review was prepared by utilizing the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines.

Inclusion Criteria:

- Evaluated outcomes of tourniquet use for ACLR.

Exclusion Criteria:

- Included concurrent ligamental procedures
- Non-English studies



Methods

Data was collected on:

- Quadriceps strength
- Thigh or Calf Girth
- Total Operative Time
- Blood Loss
- Postoperative Opioid Consumption
- Pain

Results

Quadriceps Strength:

- No differences at 3 months, 6 months, and 1 year postoperatively.

Thigh Girth:

- No differences at 1-3 months postoperatively.

Calf Girth:

- No differences in calf girth postoperatively.

Operative Time:

- One of five studies demonstrated decreased operative time with a tourniquet (72.5 ± 5.6 minutes to 58.4 ± 5.7 minutes; $p < 0.05$).

Results continued

Intraoperative Blood Loss

- One study reported a decrease from 230.2 ± 22.3 mL to 95.3 ± 25.1 mL with a tourniquet ($p < 0.001$).

Postoperative Blood Loss

- Three studies reported increases from 75.6-186.7 without a tourniquet to 133.6-327.6 mL with a tourniquet ($p<0.05$).

Opioid Consumption

- Only one out of three studies found on a difference on POD1 from 4.3 ± 2.9 mg to 8.8 ± 3.7 mg ($p= 0.001$).

Pain

- Five studies reported increased pain with tourniquet use up to 5 hours to POD1.

Conclusion

- Tourniquet use during ACL reconstruction does not have negative long-term effects on quadriceps strength.
- Increased quadriceps atrophy and pain in the immediate postoperative period do not persist.

Clinicians can feel comfortable using a tourniquet as long-term quadriceps strength does not appear compromised. However, if hemostasis can be achieved with pharmacologic intervention, surgeons should consider no tourniquet use to avoid immediate postoperative pain, decreased short-term quadriceps strength, and increased postoperative blood loss.

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