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A Kirkley, R Rampersaud, S Griffin, A Amendola, R Litchfield and P Fowler
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Tourniquet use during arthroscopy did not adversely affect patient outcomes

Kirkley A, Rampersaud R, Griffin S, Amendola A, Litchfield R, Fowler P. *Tourniquet versus no tourniquet use in routine knee arthroscopy: a prospective, double-blind, randomized clinical trial. Arthroscopy. 2000 Mar;16(2):121-6.*

Question: In patients having knee arthroscopy, what is the effect of tourniquet use on postoperative pain and functional outcomes?

Design: Randomized (allocation concealed), double-blind, controlled trial with 3-month follow-up.

Setting: University hospital in London, Ontario, Canada.

Patients: Patients older than 16 years of age who were scheduled for 1-hour knee arthroscopy. Exclusion criteria were anterior cruciate or posterior cruciate ligament reconstructive surgery, total synovectomy or meniscal suturing, evidence of neuromuscular disease or systemic illness, or inability to read or write in English. Of 145 patients enrolled, 120 (83%) (mean age, 43 years; 72% men) met the inclusion criteria and completed the study.

Intervention: All patients had a pneumatic tourniquet applied to the thigh of the operative leg and were allocated to the tourniquet being inflated to 300 mm Hg ($n = 61$) or not inflated ($n = 59$). General anesthesia was used for all operations.

Main outcome measures: Oral narcotic use and pain (measured by a 100-mm visual analog scale) for the first 5 postoperative

days; self-reported health status using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC); objective functional outcome measured by the 6-minute walk test, 30-second stair climb, and 1-leg standing vertical leap; isokinetic strength testing; and time to return to work or sport. Health status and functional outcomes were assessed at 2 and 6 weeks and at 3 months.

Results: The study had 80% power to detect a 25% mean difference in WOMAC pain score. Mean WOMAC scores did not differ between the groups (2 wk, $P = 0.88$; 6 wk, $P = 0.93$; 3 mo, $P = 0.62$). The average oral narcotic use was 48.9 mg in the inflated tourniquet group and 49.1 mg in the uninflated group. The groups did not differ for assessment of postoperative pain ($P = 0.24$), except in patients whose surgery lasted >30 minutes ($n = 51$) (greater pain was reported by the inflated tourniquet group [$P = 0.019$]). The groups did not differ at any time point in objective functional outcome measures or isokinetic strength testing, time to return to work (18.2 d vs. 15.4 d, $P = 0.61$), or return to sport (28.2 d vs. 20.9 d, $P = 0.58$). The surgeons, who were blinded to tourniquet status, reported improved visibility and less technical difficulty with the inflated tourniquet, but mean operative time did not differ between the groups.

Conclusion: In patients having knee arthroscopy, tourniquet use during the procedure did not affect postoperative pain or functional outcomes.

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Commentary

The use of a tourniquet for knee arthroscopy is standard for some surgeons, while others prefer not to use one. The decision not to use a tourniquet is supported by randomized trials that have shown electromyographic changes or delay in functional recovery with the use of a tourniquet in knee surgery. However, these studies involved patients who received either anterior cruciate ligament reconstruction or open meniscectomy and are therefore not generalizable to simple knee arthroscopy^{1,2}. This study by Kirkley and colleagues focused exclusively on the latter.

This double-blind, randomized clinical trial evaluated outcomes that are relevant to patients, such as pain, health status, and time to return to work and sport. The only statistically significant difference between the 2 groups was for postoperative pain in patients whose surgery lasted >30 minutes. While not achieving statistical significance, the no-tourniquet group returned to work 2.8 days earlier (15.4 vs. 18.2), returned to sport 7.3 days earlier (20.9 vs. 28.2), and had improved isokinetic knee flexion and extension at 2 weeks (16% and 20%, respectively). The sample size calculations were not based on these variables, and it is possible that there was not sufficient power to detect a statistically significant difference for these comparisons. While this study was not limited to athletic patients, it could have implications for knee arthroscopy in athletes for whom a prompt return to competition is desired.

The use of a tourniquet for simple knee arthroscopy has, at most, a small negative effect on patient function in the first two weeks post-surgery, but no effect in the longer term.

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(2) Dobner JJ, Nitz AJ. Postmeniscectomy tourniquet palsy and functional sequelae. *Am J Sports Med.* 1982;10:211-4.