



Long-Term Outcomes Are the Same Regardless of Age in Patients Having Meniscal Suture Repair

Written by Maria Vinall

Meniscus tears are among the most common orthopedic injuries. Because removal of the tissue surrounding the torn meniscus can lead to reduced protection of the surrounding articular cartilage, there has recently been an increasing preference for repair. In the past 7 years in the United States, meniscus repair procedures have increased, while the number of meniscectomies has stayed the same [Abrams GD et al. *Am J Sports Med* 2013]. Varying rates of failure have been reported, however, and it is unclear whether age is a factor in procedural failure.

Karen K. Briggs, MPH, The Steadman Clinic and Steadman Philippon Research Institute, Vail, Colorado, USA, reported the results of a study that assessed long-term outcomes following meniscus suture repair in patients aged <40 years compared with those aged ≥40 years. After 16 years of follow-up, there were no differences in outcomes; both groups were high functioning with similarly high levels of satisfaction.

This was a prospective data registry study of meniscus repairs by a single surgeon between 1992 and 2003 in patients aged <40 years (group 1) and those aged ≥40 years (group 2). All patients aged ≥18 years who underwent meniscus suture repair using the inside-out technique were included. Patients were excluded if they were <18 years of age, underwent previous meniscal surgery, had associated fractures, or had multiligamentous knee injuries.

Outcomes were measured after a minimum of 10 to 22 years of follow-up and included the Medical Outcomes Study 12-Item Short-Form Health Survey Physical Component Score and Mental Component Score, condition-specific outcomes measured by the Lysholm score, the International Knee Documentation Committee Subjective Knee Evaluation Form, and the Western Ontario and McMaster Universities Arthritis Index. Patient satisfaction was measured using a scale ranging from 1 to 10, with 10 indicating “very satisfied.”

Group 1 included 142 patients (97 men, 45 women) with a mean age of 27.5 years (range: 18–40 years). Fifty-one of these patients (36%) required subsequent surgery at a mean of 5.1 years (range: .8–19.5 years) after their initial surgery. Thirteen patients had surgery <1 year after the initial repair, while 15 patients had surgery >10 years after the initial repair.

Group 2 included 49 patients (26 men, 23 women) with a mean age of 49.9 years (range: 40.0–70.6 years). Nineteen of these patients (39%) required subsequent

surgery: 3 total knee arthroplasties at a mean time of 11.5 years (range: 9.8–14 years) and 16 arthroscopies at a mean time of 7.6 years (range: .8–16.5 years) after the initial surgery. Four patients had surgery <1 year after the initial repair, while 6 patients had surgery >10 years after repair. There were no differences in outcome scores between the groups at ~16 years.

This study had limitations, including an uncontrolled referral population, different types of meniscus tears, and the interpretation of subsequent surgery. Despite these limitations, the authors concluded that there was a similar prevalence of subsequent procedures required in both age groups. There were no outcome differences between the groups, with high function and high patient satisfaction being reported by most patients at an average of 16 years following meniscus suture repair.

Second-Generation Meniscal Repair Systems as Effective as First Generation

Written by Maria Vinall

Second-generation suture-based devices for meniscal repair appear to have overcome some of the complications associated with first-generation all-inside designs, but there have been no outcome studies of these second-generation systems beyond 3 years. Ljiljana Bogunovic, MD, Washington University in St. Louis, St. Louis, Missouri, USA, discussed the results of a retrospective review of 83 consecutive meniscus repairs (either isolated or combined with anterior cruciate ligament reconstruction [ACLR]), which reported an 84% success rate with a second-generation all-inside repair system at a minimum of a 5-year follow-up. The success of the repair was similar for isolated repairs and for those performed in conjunction with ACLR. Patient age or sex did not affect the outcome.

Patients were identified by billing records as well as the Multicenter Orthopedic Outcomes Network database. A single sports-fellowship-trained surgeon using the FasT-Fix all-inside repair device performed the repairs arthroscopically. Sutures were placed until the desired stability was achieved. All tears were either longitudinal or bucket-handle in orientation, and involved either the red/red or red/white meniscal zones. Patients with isolated tears were weight bearing as tolerated in a knee immobilizer for 6 weeks postoperatively. Patients with combined ACLR were weight bearing as tolerated without bracing. *Failure* was defined as repeat surgical intervention requiring revision, repair, or resection. Failure information was obtained by telephone interview

and chart review after a minimum of 5 years. Patient-reported outcomes were assessed using Knee Injury and Osteoarthritis Outcome Scores (KOOS), International Knee Documentation Committee (IKDC) Subjective Knee Form scores, and Marx activity scores.

Average follow-up at 7 years (range, 5 to 13) was obtained for 90% of the 81 patients (mean age, 27 years; range, 14 to 54 years). Within the final cohort, there were 26 isolated repairs and 49 repairs combined with ACLR. *Time to failure* was defined as the interval between index meniscal repair and repeat repair or meniscectomy.

Failed meniscal repairs were noted in 16% (n=12) of the total cohort at a mean of 47 months (range, 15 to 95). Similar failure rates were noted for medial (18%) and lateral (8.0%) meniscal repairs (p=.744). Isolated repairs failed at a rate of 11.5% (95% CI, -.76 to 23.75) compared with 18.3% (95% CI, 7.5 to 29.1; p=.526) for the combined procedure. Individual failure rates are shown in Table 1. Patient age, sex, number of sutures, length of follow-up, or type of procedure (isolated vs combined) did not affect the meniscal failure rate.

Table 1. Meniscus Failure Rate After Mean of 5 Years

| | Isolated Repair | Combined Procedure | p Value |
|--------------------------|-----------------|--------------------|---------|
| Total failure rate (%) | 11.5 | 18.3 | 0.526 |
| Lateral failure rate (%) | 0 | 2.0 | 1.0 |
| Medial failure rate (%) | 18.8 | 17.6 | 0.250 |
| Time to failure (months) | 48.1 | 46.6 | 0.939 |

Postoperative KOOS and IKDC scores were similar between the isolated and combined treatment groups. Marx activity scores were significantly (p=.03) higher in patients having isolated meniscus repair compared with those having both meniscus repair and ACLR.

This study is limited by its retrospective nature, a definition of *meniscal failure* that may underestimate true repair failure, and possible insufficient patient numbers to detect a difference between isolated repairs and those performed with ACLR. Despite this, it is apparent that second-generation all-inside meniscal repair devices improved long-term (>5 years) failure rates compared with first-generation repair devices and were equal to those of inside-out, outside-in, and open repairs. Equivalent long-term failure rates were also noted with isolated repairs compared with repairs performed with concurrent ACLR. Meniscal repair with a second-generation all-inside repair system is a reliable technique with good longevity.

FNB Associated With Persistent Muscle Weakness in Pediatric and Adolescent Patients

Written by Brian Hoyle

T. David Luo, MD, Mayo Clinic, Rochester, Minnesota, USA, reported on a study that demonstrated long term deficits in muscle strength when anterior cruciate ligament (ACL) reconstruction was accompanied by femoral nerve blockade (FNB) in pediatric and adolescent patients.

FNB is often used to provide analgesia following ACL reconstructive surgery. Although rare, femoral neuropathy can occur, producing weakness, numbness, and pain. The effect that FNB complications might have on patients ≤ 18 years has been unclear.

The retrospective, matched cohort study compared outcomes at 6 months after ACL reconstructive surgery in 169 pediatric and adolescent patients whose surgery, conducted from 2001 to 2010, involved FNB or did not (control). The nerve blockade was accomplished using 20 to 50 ml of .25% or .5% marcaine under nerve stimulator or ultrasound guidance. Because of revision ACL surgery or prior ipsilateral or contralateral knee surgery, 45 patients were excluded. The remaining 124 patients comprised 62 patients in the FNB group (46 via continuous flow over 48 hours, 16 by single injection) and 62 patients in the control group.

The 6-month outcomes were isokinetic strength and function during slow extension and flexion (both 60° per second), fast extension and flexion (both 180° per second), vertical jump, triple jump, and single leg hop. The return to sports of the patients was also assessed. The cohorts were matched for baseline demographics (Table 1).

Table 1. Demographics of the Matched Cohorts

| | FNB (n = 62) | Control (n = 62) | p Value |
|---------------------|--------------|------------------|---------|
| Mean age at surgery | 16.2 ± 1.5 | 15.9 ± 1.4 | 0.263 |
| Sex | 31 M 31 F | 25 M 37 F | 0.279 |
| BMI | 23.7 ± 4.1 | 23.8 ± 3.6 | 0.890 |
| Tegner score | 8.4 ± 1.0 | 8.2 ± 1.0 | 0.295 |

BMI=body mass index; FNB=femoral nerve blockade.

Concerning surgical factors, the autograft type in patients who received a FNB was predominantly bone-patellar tendon-bone (69%), with hamstring autograft used in 31% of cases. The control group comprised