

## **RADIOGRAPHIC OSTEOARTHRITIS AND KNEE SYMPTOMS 32-37 YEARS FOLLOWING ACUTE ANTERIOR CRUCIATE LIGAMENT INJURY**

H. Gauffin<sup>1</sup>, S. R. Filbay<sup>2</sup>, C. Andersson<sup>1</sup>, C. Ardern<sup>3</sup>, J. Kvist<sup>4</sup>;

<sup>1</sup>Orthopedic Dept., Linköping, Sweden, <sup>2</sup>Univ. of Oxford, Oxford, United Kingdom, <sup>3</sup>Linköping Univ., Linköping, Sweden, <sup>4</sup>Karolinska Inst., Stockholm, Sweden

**Purpose:** Anterior cruciate ligament (ACL) rupture is one of the most common sports-related knee injuries. There has been an extensive number of studies of short-term (up to 5 years after injury) results, but only a few studies have followed patients beyond 15 years. One of the possible, debilitating problems after ACL injury is knee osteoarthritis (OA). OA brings problems associated with physical inactivity, and with burden on the health care system.

### *Aims*

- i. To describe the prevalence of radiographic osteoarthritis (ROA) and knee symptoms 32-37 years following acute ACL injury, and
- ii. To compare prevalence of ROA and knee symptoms between individuals managed with and without ACL surgery.

**Methods:** This is a 32-37 year follow-up of 251 consecutive patients with acute ACL injury who were allocated to early surgical (augmented or non-augmented repair within 25 days of injury) or non-surgical ACL management based on an odd or even birth year. They all underwent an early diagnostic arthroscopy including grading of concomitant injuries. Baseline information including associated injuries, surgical notes, physical examination and activity level were collected for all patients. The surgical technique was repair of the ACL with or without augmentation using the iliotibial band. Following ACL surgery, patients wore a non-weight bearing ankle to groin cast for 6 weeks. Patients who were managed without ACL surgery who had surgical repair of concomitant injuries (e.g. collateral ligaments or meniscus) wore a cast for 4 weeks postoperatively. Rehabilitation was commonly completed 4-6 months after injury in the non-ACL surgery group, and 9 months after injury in the ACL surgery group. To be eligible for long-term follow-up, patients must have had an acute ACL injury 32-37 years previously and be aged between 15 and 40 years at the time of injury. Excluding criteria included neurological impairments, generalized joint diseases such as RA, and hip replacements. Patients were invited to complete a

questionnaire battery including the Knee injury and Osteoarthritis Outcome Score (KOOS) and to have radiological examination of both knee joints. Osteoarthritis in the tibiofemoral joint (TFJ) and patellofemoral joint (PFJ) was assessed using bilateral plain weight bearing radiographs. One radiologist, who was blinded to the treatment (ACL surgery or no ACL surgery), assessed all radiographs according to Kellgren & Lawrence criteria. Radiographic osteoarthritis was defined as Grade 2 or higher for the TFJ and PFJ. We classified patients with knee arthroplasty as having Grade 2 or higher in the TFJ. Patients were categorized as having knee symptoms if at least 50% of the items in subscales of KOOS Pain and/or KOOS Symptoms were at least one 1 step from full.

### *Statistical analysis*

We used Pearson's chi-squared tests for between-group comparisons of ROA prevalence and knee symptoms prevalence.

**Results:** Of the 251 patients, 7 had died and contact details were missing for 10, leaving 234 contactable patients. Four patients declined participation and 40 did not reply to the invitation. 190 patients completed the questionnaire (response rate 81%). Nine patients were excluded from this analysis; 3 had hip replacement, 2 had new major injuries to the knee, 1 had a stroke, 1 had generalized joint pain as an adverse effect of cancer medication, and 2 had rheumatoid arthritis.

137 patients had radiographs and were included in the analysis; 52 patients (33% females, mean age at injury  $25 \pm 6$ , 69% with meniscus injury at baseline) in the non-ACL surgery group, and 85 patients (26% females, mean age at injury  $24 \pm 6$ , 56% with meniscus injury at baseline) in the ACL-surgery group. The prevalence of TFJ-ROA was 63%. The prevalence of PFJ-ROA was 36%. The prevalence of knee symptoms was 64%. The non-ACL surgery group had a higher prevalence of TFJ-ROA (79%) compared to the ACL surgery group (53%) ( $p < 0.01$ ) (Figure 1).

Excluding the 11 patients with knee arthroplasty, 15 patients (32%) in the non-ACL surgery group and 29 patients (39%) in the ACL surgery group had PFJ-ROA ( $p = 0.45$ ) (Figure 1). Excluding the 11 patients with knee arthroplasty, 30 patients (61%) in the non-ACL surgery group and 50 patients (66%) in the ACL-surgery group had knee symptoms ( $p = 0.60$ ).

**Conclusions:** Surgical management of acute ACL injury was associated with a reduced prevalence of TFJ-ROA compared with management without ACL surgery, at 32-37 year follow-up. The prevalence of PFJ-ROA and the prevalence knee symptoms was similar between both groups.

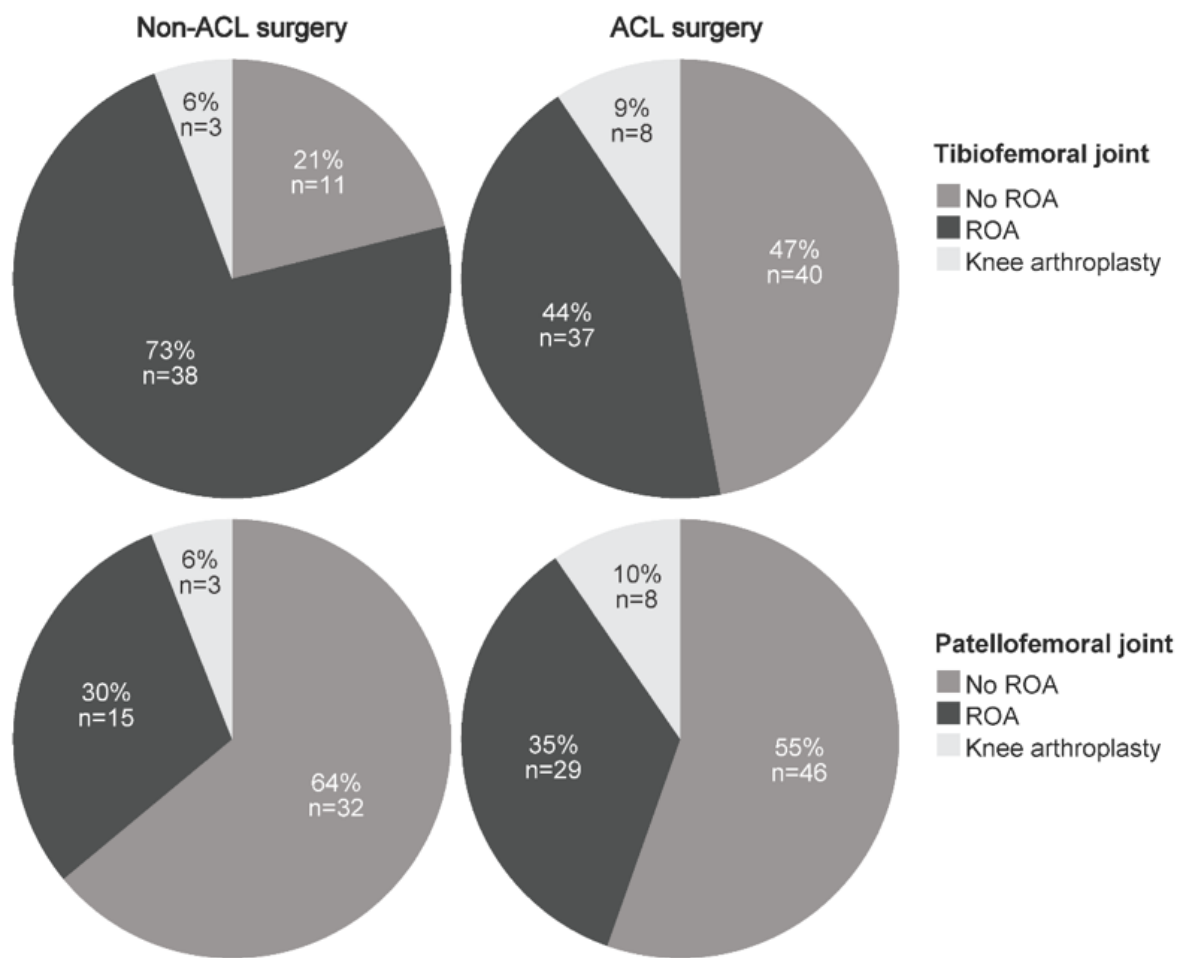


Figure 1.