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## Overtreatment of cruciate ligament injuries

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We thank Dr. Løken and colleagues for their interest in our study on anterior cruciate ligament (ACL) injuries. At 2 years of follow-up our randomized controlled study showed no advantage of early ACL reconstructive surgery with structured rehabilitation over that of structured rehabilitation only with optional reconstruction 'as needed', as monitored by KOOS (1). Moreover, we found no difference in any of the secondary outcomes, or in the number of meniscal surgeries during the 2-year follow-up. We share the concern of Løken and colleagues for the long-term outcome after injury to the anterior cruciate ligament (ACL), in particular the development of osteoarthritis, and continue to monitor this patient group long term by patient-reported outcomes, activity level, plain radiographs, magnetic resonance imaging, and biomarkers. Results for these outcomes will be reported.

Løken and colleagues raise three points. Firstly, they suggest that the literature shows that a functionally intact meniscus may be important to prevent future osteoarthritis in the ACL-injured knee. We agree on the likely importance of a functionally intact meniscus to prevent the development of knee osteoarthritis, but note that not all reports on the ACL-injured knee are consistent with this hypothesis.

Secondly, they suggest that the risk of re-injury may be increased in the non-reconstructed knee. This is certainly possible, but all studies published so far with the exception of one (1), are confounded by indication. We agree that the registry study of Granan (2) shows that the frequency of observed cartilage and meniscal damage increases with time after injury. This is to be expected, has been reported (3,4), and may be interpreted as early-stage osteoarthritis development. In the Granan study, no results were provided to report later cartilage and meniscus status by follow-up of those already reconstructed, so we are unable to draw any conclusions on the benefit of reconstruction on these outcomes from their study. Further, no data are available for those not included in the registry, and meniscus injury caused by the initial trauma is not reported. Recent observational studies find no difference in later osteoarthritis between those reconstructed or not (4,5).

Thirdly, Løken and colleagues suggest that a difference in meniscal surgery rate between our study groups may develop with time. This is certainly possible. We found no difference between the two study groups in the number of meniscal surgeries at two years. Whether differences will show at later times remain to be reported. Until then we can only speculate.

A high proportion of those with an ACL tear become 'young patients with old knees'. The rate of osteoarthritis development after these injuries remains a major clinical challenge: with regard to preventing these injuries, preventing osteoarthritis developing after the injury, and treating severe osteoarthritis in the young and active patient. We encourage further basic research on disease mechanisms, randomized trials to identify the best treatments, and large and long-term registry studies with minimal loss to follow-up to monitor long-term outcome and complications. In these studies, patient reported outcomes are central, other outcomes such as radiographic changes or numbers of surgeries are at best surrogates.

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