

X-ref For other Roundups in this issue that cross-reference with Sports see: *Foot & Ankle Roundups 1 & 2.*

Definition, investigation, and classification of meniscal lesions of the knee X-ref

■ One of the current ‘fads’ in orthopaedic publications is the consensus statement. Although consensus statements vary greatly in their quality, methodology, and relevance, some are clearly of high quality and cover clinically relevant topics in great depth. We were delighted to see one such publication from **Oxford (UK)**, which sets out to examine the consensus surrounding meniscal tears in the knee.¹ This group has set out the definition of what a meniscal tear is, as well as how surgeons can investigate and justify treatment of meniscal tears. This consensus was reached using an iterative Delphi approach combined with nominal group techniques to decide upon definitions in clinically relevant categories. This paper is almost essential for the sports knee surgeon, and for any other interested researcher. Broadly, the authors defined and classified symptoms into those strongly suggestive of a treatable lesion, those potentially suggestive of a treatable lesion, and those suggestive of osteoarthritic symptoms. MRI findings for meniscal lesions were also classified similarly into those strongly suggestive of, possibly suggestive of, and not suggestive of a therapeutic target. This consensus work is likely to yield benefit rather quickly if adopted, as it serves as a common framework for classifying and defining meniscal lesions.

Transtibial or independent tunnels?

■ There are two distinct ways to drill tibial and femoral tunnels: independently, where each tunnel is drilled wherever appears to be the optimal place for graft positioning; or a combined approach, where the tunnels are drilled as a single tunnel. While there are proponents of both, most anterior cruciate ligament (ACL) surgeons have moved towards a tibial independent technique for ACL reconstruction rather than the transtibial technique. This study from **California, Los Angeles (USA)** is interesting in that it evaluates these two pre-grafting drilling techniques in terms of the revision rate for ACL reconstruction.² Although the independent technique potentially

provides increased accuracy in graft placement, it also potentially means that the graft is not being passed through parallel tunnels. There is a risk that this may have an effect on the reconstructed ACL graft function and viability. The authors based their report on a large cohort of over 19 000 patients in a single healthcare payers database. They collated a complete range of patient and operative variables, and assessed revision surgery as an outcome. The authors used an appropriate multivariable Cox proportional hazard regression model to undertake an adjusted analysis for risk for aseptic revision for graft failure dichotomized by ACL tibial tunnel type. The analysis included aseptic reoperation for meniscal or chondral injury, and the models included the covariates age, gender, body mass index, race, graft type, and femoral fixation type. Follow-up was to an average of 2.3 years, and 64% of patients (n = 12 342) underwent tibial independent tunnel placement. This incidence increased from 34% of ACL reconstructions in 2009 to 83% in 2014. The headline result of this paper is that following adjustment for covariates, the independent tunnel group had a higher risk for aseptic revision than the transtibial group. This risk was 1.41 times higher in patients younger than 22 years specifically. The five-year cumulative reoperation risk was lower in the independent tunnel group (4.50% vs 5.06). However, after adjustment covariates, this difference disappeared with a hazard ratio of 1.08. Essentially, this study shows that there are lower rates of revision in the transtibial group, which seems to be against current thought, and it may be that there needs to be an evaluation of the utility of this approach. That said, the authors did not undertake a time-related sensitivity analysis, and there is a strong temporal trend here. If the indications or rehabilitation have changed over the same time period, it may be that the tibial tunnel position technique is in fact a red herring.

Patellar dislocation MRI-based imaging variables

■ Patellar dislocation is a common problem in those with high joint mobility scores, both in sports and daily life. Associated with trochlear dysplasia and hypoplastic medial patellofemoral ligaments, the initial treatment in the majority of centres around the world is simply reduction

followed by physiotherapy aimed at developing function of the vastus medialis obliquus. There is little data to support decision making for predicting the success, or otherwise, of such a strategy. There are even fewer studies based on the outcomes of conservative treatments with reference to initial imaging. We were delighted, here at 360, to come across this interesting paper from **Minneapolis, Minnesota (USA)**, which presents a simple and easy-to-use scoring system based on initial imaging.³ The authors developed their score based on 145 patients with a primary lateral dislocation. They included MRI scanning within six weeks of primary dislocation and had two years of follow-up from a mix of retrospective and prospective cohorts. Overall, 42% (n = 61) underwent a secondary dislocation. Their stepwise logistic regression analysis established that skeletal immaturity (odds ratio (OR) 4.05), sulcus angle (OR 4.87), and Insall–Salvati ratio (OR 3.0) were significant predictors of redislocation in this cohort. Using a receiver operating curve model to establish the sensitivity and specificity relationships, the authors were able to determine evidence-based threshold values for sulcus angle $\geq 154^\circ$ and Insall–Salvati ratio ≥ 1.3 . The probability of redislocation in this series based on the presence of factors was 5.8% with no factors present and 22.7% with any one factor present, increasing to 78.5% if all three factors were present. This is an easy scoring system to predict the risk of recurrent patellar dislocation. Although the score was only based on events in 61 patients, it is as good a system as there currently is.

Meniscal ramp lesions in 3214 anterior cruciate ligament-injured knees

■ The ramp lesion (tear in the attachment between the posteromedial meniscus and knee capsule in ACL deficient knees) was originally defined as a longitudinal tear of the peripheral attachment of the posterior horn of the medial meniscus at the meniscocapsular junction of less than 2.5 cm in length. More recently, ramp lesions have been attributed to injury to the meniscotibial ligament attachment of the posterior horn of the medial meniscus. These lesions are recognized to profoundly alter knee kinematics and are known to cause pain and dysfunction. In this very large study of 3214 anterior cruciate ligament-injured knees from the SANTI (Scientific Anterior

Cruciate Ligament Network International) Study Group Database, authors from **Lyon (France)** set out to establish the overall incidence of ramp lesions.⁴ Each patient underwent a transnotch posteromedial compartment evaluation of the knee during anterior cruciate ligament reconstruction (ACLR). In this large clinical cohort, a ramp repair was undertaken if a lesion was seen on direct arthroscopy. The authors undertook analysis of the data set for association with the presence or absence of ramp lesions. A further secondary analysis of patients who underwent repair was undertaken at a minimum follow-up of two years to determine the secondary partial meniscectomy rate for failed ramp repair. In this large cohort of all the patients included in the study, 769 ramp lesions (23.9%) were identified and multivariate analysis demonstrated an association between ramp lesions and male gender, patients aged < 30 years, revision ACLR, chronic injuries, preoperative side-to-side laxity > 6 mm, and concomitant lateral meniscal tears. At two years of follow-up, the secondary meniscal surgery rate was nearly 11% at 45 months. This study has shown that ramp lesions are much more common than widely accepted (23%) in patients undergoing ACLR. Surgeons need to look for this during ACLR and consideration should be given to repair as appropriate.

What happens to the ACL stump? X-ref

■ Despite the relatively high interest in anterior cruciate ligament (ACL) injury as a condition, not much is known about the natural history of the torn but not repaired ACL. Investigators in **Petah Tikva (Israel)** have published a morphological study based on the findings at arthroscopy of 101 patients, all of whom had undergone an ACL rupture previously and were undergoing ACL reconstruction.⁵ The concept was to establish the pathological features observed, and to correlate those to the time since injury, with the aim of filling in some of the many unknowns surrounding the natural history of ACL rupture. The authors recorded the findings at arthroscopy of 101 patients, all of whom had a known definite date of ACL rupture. The authors then performed a correlation analysis of the pathological features of the remnant and time since injury. They also reported, as a secondary outcome, the relationship of this morphology to chondral lesions and meniscal tears. The authors identified four distinct ACL tear morphological patterns that were seen to be related to the time interval since ACL injury. The common end-stage of this process was scarring of the ACL remnant to the posterior cruciate ligament. This was seen to occur around six months following injury. The authors established that, within three months of injury, little scar

tissue is present. This is then followed by a period of scarring of the remnant to the notch, followed by healing to the PCL remnant. The authors suggest that research into healing of the ACL should focus on the first three months, which seems reasonable.

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