2023 Congress Abstracts: Knee Meniscus

Current Practice for Meniscus Repair Rehabilitation Amongst AOSSM Membereks

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Summary:
Survey study on the current trends for rehabilitation following meniscus repair depending on tear morphology.

Data:
Introduction: Meniscus repair has correspondingly become more popular, with promise of preservation of joint mechanics and hopes of preventing secondary arthritis. However, it is not clear the optimal rehabilitation protocol, with regards to the duration of limitation of range of motion and weight bearing, following repair of various meniscal tear types. It is prudent for orthopaedic surgeons to understand the current contextual landscape of how practitioners recommend rehabilitating patients that undergo meniscal repair. Methods: This is a cross-section observational survey study. A de-identified survey was designed using arthroscopic images from six cases of meniscal repair: Radial tear at popliteal hiatus, medial meniscus posterior root repair, lateral meniscus radial tear, lateral meniscus horizontal tear, medial meniscus red-white zone bucket-handle repair, and medial meniscus red-red zone longitudinal peripheral tear. This survey was distributed to American Orthopaedic Society for Sports Medicine (AOSSM) members by e-mail. Questions were designed to elicit, from the surveyed surgeons, their recommendations for duration of limitation of: 1. range of motion, and 2. weight bearing status, for each case. Additionally, use of meniscal repair adjuncts, including bracing and use of biologics, was elicited from the same cohort. Results: 451 completed surveys were obtained from 2973 AOSSM members (15.2%). A majority of AOSSM members recommend bracing after repair of tears that lost hoop integrity (83.3%) and that had intact hoop integrity (76%). A majority of members report use of synovial rasping/trephination (86.0%) and notch microfracture (66.5%), while a minority report use of more involved biologic interventions including classic fibrin clot (4.9%), platelet-rich plasma (8.9%), and bone marrow aspirate concentrate (2.9%). Timing of return to weight-bearing and range of motion appear to depend on hoop stress integrity; tears with intact hoop integrity were, on average, permitted to return to weight bearing more quickly (1.4 weeks for partial weight bearing, 3.6 weeks for full weight bearing), versus tears that demonstrated loss of hoop integrity (3.9 weeks for partial weight bearing, 6.2 weeks for full weight bearing). Hoop integrity also appears to affect return to full range of motion, with tears that had a loss of hoop integrity demonstrating a longer period of post-operative restriction of range of motion. Full flexion was permitted at an average of 5.0 weeks for tears with intact hoop stress, versus 5.8 weeks for tears with loss of hoop stress. Out of the six cases presented, the most cautious tear types for post-repair rehabilitation were a radial tear at the popliteal hiatus, followed by a medial meniscus posterior root tear. Conclusions: Overall, a majority of AOSSM practitioners brace after meniscal repair. A majority of practitioners perform in situ adjuncts for biological healing, while a minority adds extrinsic biologics. Although there is no consensus on how each tear type should be rehabilitated following repair, initial tear hoop stress integrity appears to substantially affect rehabilitation decision-making, with loss of hoop stresses triggering a more conservative approach to rehabilitation, both with regards to permissive return to range of motion and weight bearing.

Medial Meniscus Anatomy Rediscovered

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Summary:
Not previously described ligaments stabilising medial meniscus have been found during cadaver dissection and then their presence has been confirmed in MRI scans.

Data:
Introduction: A new, not previously described pair of ligaments stabilising the medial meniscus (MM) were found during a cadaveric knees’ dissection. Follow-up studies – anatomical (prospective) and radiological (retrospective) were conducted to further investigate and establish their possible clinical and surgical relevance. METHODS: Anatomical study - while dissecting 18 cadaveric knees a previously not reported ligament was observed posterior to the medial collateral ligament (MCL), running from the femur and attaching adjacent to the posterior horn of medial meniscus (Zone 4), tentatively named a medial meniscus meniscofemoral ligament (MMFL). A second ligament running from the inferior border of MM Zone 4, over semimembranosus tendon with a distal insertion at the tibia where it runs posteriorly to MCL was named a medial meniscus meniscotibial ligament (MMTL). The ligaments were photographically documented. Further retrospective radiological analysis of 100 knee 3T MRIs (Coronal PD/Dixon sequences) was carried out (44 women, 55 males; mean age 41.9 years). The identification of MMFL & MMTL was made through a consensus between MSK radiologist, anatomist, and orthopaedic surgeon based on defined set of criteria: visible/not visible; normal/abnormal structure; torn. Concomitant pathologies were noted: ACL tear/deficiency; MM lesion (acute tear, degeneration, absence); presence/grade of articular cartilage defects in the medial compartment (MCAC). Statistical analysis was done using a Spearman’s p test. RESULTS: The anatomical dissections so far revealed the ligaments in all specimens. The MRI analysis has confirmed the ligaments’ presence in 95 knees; in 3 cases MMFL and in 4 MMFL were absent. In 21% the ligaments were normal, in 65% degenerated, and in 10% torn. In 77% of knees joint effusion and in 34% an ACL injury were recorded. Statistically significant correlation was found between the degree of soft tissues pathologies and the extent of MMFL and MMFL changes – more severe soft tissue damage correlated with higher degree of the ligaments’ abnormalities. Acute MM tears or degeneration correlated highly with abnormal structural changes of MMTL/MMFL. CONCLUSIONS: The ligaments disruption resulting in MM injury or degeneration often coincides with acute ACL tears and soft tissues damage within the knee joint. The injury mechanism in which MM is torn seems likely to be a scenario where the ligaments are pulled away from each other during knee movement. Proper stabilisation of the meniscus is crucial for the knee biomechanics. Therefore, determining a surgical technique based on the rediscovered medial meniscus anatomy will play a significant role in optimising medial meniscus treatment and improving long-term outcomes. Nevertheless, at the current stage further biomechanical studies and technical analysis of...