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BROWSER'S NOTES

# Browser's notes

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**The glycosaminoglycan content of hip cartilage in osteonecrosis of femoral head: evaluation with delayed gadolinium-enhanced magnetic resonance imaging of cartilage.**

*Zhang Q,* et al.
*Cartilage. (2018); Oct 3. [Epub ahead of print] PMID: 30282478*

This MR study of femoral head osteonecrosis (FHO) in 60 patients (mean age 32.4 years, mean BMI 24.4, 36 male) evaluated the articular cartilage quality using delayed gadolinium enhanced MR imaging of cartilage (dGEMRIC). Cartilage in the involved joint was compared to hip cartilage in 15 asymptomatic controls with similar age and body mass index (BMI). The T1 maps were created from inversion recovery acquisitions with 5 inversion times (100–1600 ms) following a double dose of dimeglumine gadopentetate and 65 min of walking (for cartilage-contrast equilibration). Patients with FHO were divided into four disease severity groups, 15 patients each, based on the Association Research Circulation Osseous (ARCO) stages 1–4. ARCO stage 1 is radiographically and CT occult but positive by MR and scintigraphy; stage 2 is radiographically apparent, but without collapse or a "crescent sign;" stage 3 has a subchondral collapse ("crescent sign") but minimal, if any, articular contour flattening; stage 4 shows progression to osteoarthritis with articular flattening and early joint space narrowing. The dGEMRIC index (post-contrast T1 relaxation time) for all FOH patients (mean 365 ms, range 200–498 ms) was significantly lower than for controls (mean 546 ms, range 504–580 ms) with no overlap between groups indicating lower glycosaminoglycan level for FOH patients. In addition, the mean dGEMRIC index worsened for each group as disease severity increased: stage 1 = 460 ms, stage 2 = 409 ms, stage 3 = 360 ms, stage 4 = 231 ms. Hips with articular surface collapse (ARCO stage 3 and 4) had significantly lower mean dGEMRIC indices than those without collapse (296 ms vs. 435 ms). These data show that even hips with early stage FHO have cartilage degeneration. Prospective studies are needed to determine if these changes can be reversed or stabilized by therapeutic interventions.

**Meniscal root tears occur frequently in multi-ligament knee injury and can be predicted by associated MRI injury patterns.**

*Kosy JD,* et al.
*Knee Surg Sports Traumatol Arthrosc. (2018); 26(12):3731–7*

Retrospective review of knee MR studies of 188 patients (mean age 31 years, range 16–64 years, 71% male) with multiple ligament knee injuries found 38 posterior meniscal root injuries in 37 knees (20%). All MR studies were performed within 2 weeks following the injury, and root tears were defined as a root avulsion or a complete radial tears within 9 mm of the root. Medial meniscal root tears (10.6%) were torn as often as lateral (9.6%). Compared to published reports of root tear rates in patients with single ligament ACL tears, multiligament injuries have at least twice the risk of meniscal root tears, primarily due to more medial side tears. Medial meniscal root tears were more common with varus injuries and medial compartment fractures while lateral meniscal root tears were associated with valgus injuries and lateral compartment fractures. Meniscal root tear frequency was not significantly related to the severity of ligamentous injury, patient age, body mass index, or injury mechanism (high vs. low energy). No comparison to operative data was made as the surgical records were incomplete. The authors speculate that compressive forces are responsible for meniscal root tears caused by acute injury.

**Abstracted by C. S. Winalski, M.D.**
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