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NEWS

RSNA Press Release

Radiologists Tackle Diagnosis of Puzzling Football Injuries

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At A Glance

- New findings on ligament injuries in football players will help in diagnosis and treatment.
- Linemen and defensive secondary players may be predisposed to tears of the outer knee ligament.
- High ankle sprain can now be diagnosed without uncomfortable physical examination of the ligaments.
- Left undiagnosed, high ankle sprain can impede athletic performance and lead to arthritis.

CHICAGO - New imaging discoveries may improve physicians' ability to diagnose and treat two serious injuries affecting football players, according to two studies presented this week at the annual meeting of the Radiological Society of North America (RSNA).

In the first study, researchers reviewed 101 magnetic resonance imaging (MRI) knee exams of 330 candidates for the 2005 professional football draft and found 57 tears of the lateral meniscus, a flat, disc-shaped ligament that supports the outer knee joint, and 26 tears of the medial meniscus, which supports the inner knee joint.

"These findings are remarkable because the authors of most previous studies have reported a predominance of medial meniscal injuries," said Jeffrey Towers, M.D., lead author of the study and associate professor of radiology at the University of Pittsburgh Medical Center in Pennsylvania.

At first, Dr. Towers suspected that the unusually high percentage of lateral meniscal tears was associated with anterior cruciate ligament (ACL) tears. ACL tears are fairly common among elite college football players, and 80 percent of meniscal tears that occur in association with ACL tears are in the outer knee joint.

"Tackling is usually done from the outside of the knee, imparting a load that traps the lateral meniscus in addition to tearing the ACL," Dr. Towers said.

However, the study revealed that while 18 lateral and eight medial meniscal tears were found in conjunction with ACL tears, 36 lateral and 18 medial tears were isolated injuries. The findings also included evidence of three prior lateral tears.

"What we found is that almost three-quarters of the lateral meniscal tears were not in the setting of ACL tears," Dr. Towers said.

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Dr. Towers believes that the discovery of this high incidence of lateral meniscal tears among elite athletes may have a significant impact on improving physicians' ability to diagnose and treat this condition.

"The fact that we found a concentration of lateral meniscal tears could mean that there's something about this sport that predisposes athletes to this injury," Dr. Towers said. "We found the highest incidence of lateral meniscal tears in linemen and defensive secondary players. Now that we recognize this, there may be ways to address the players who are most at risk for this injury."

In a second paper, Dr. Towers and colleagues identified for the first time an indirect sign of syndesmotic tear, a frequently misdiagnosed injury more commonly known as high ankle sprain. Currently, the condition is most commonly diagnosed by uncomfortable physical examination of the syndesmosis, a large ligament above the ankle.

"In syndesmotic tear, the biggest ligament that holds the tibia and fibula together is injured," Dr. Towers explained. "The fibula can move away from the tibia, and the cylindrical groove which forms the ankle can widen under load. The problem is that routine x-rays may not show it, because it's not grossly misaligned. It's during athletic activity when the injury becomes most apparent."

Left undiagnosed, high ankle sprain can impede an athlete's performance and lead to arthritis. "The treatment for high ankle sprain is different and generally longer than for a typical ankle sprain," Dr. Towers said. "If it is not recognized, and you send somebody out to play, the ligaments heal improperly, the ankle doesn't fit as tightly as it should, and often the result is arthritis."

The researchers used MRI and x-rays to study 18 candidates for the 2005 professional football draft who were found to have a history of high ankle sprain. Fourteen x-rays showed an abnormal growth of new bone, known as periostosis, at the lower part of the tibia, the large bone between the knee and foot. Two MRI exams revealed abnormal swelling due to fluid at the same site.

According to Dr. Towers, this periostosis provides physicians with an indirect sign of high ankle sprain that is decisive in diagnosing this difficult-to-detect injury.

"Even if I don't have MR images that include the entire syndesmosis, which goes into the lower leg," Dr. Towers said, "if I look at an ankle and see this posterior periostosis, I can now be fairly sure of a syndesmotic injury."

Co-authors on both studies are Derek Armfield, M.D., James Bradley, M.D., John Norwig, M.E.D., from University of Pittsburgh Medical Center and Kenneth Buckwalter, M.D., from Indiana University Medical Center, which coordinates imaging for the professional football draft.

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