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NEWS

RSNA Press Release

Radiologists Use MRI to Keep Basketball Players on Their Feet

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At A Glance

- MRI depicts excess fluid accumulation in the foot before a stress fracture becomes evident.
- More than one-third of athletes studied demonstrated foot abnormalities.
- Early identification and treatment helps prevent debilitating injuries.

CHICAGO - Early identification of potential stress fractures with magnetic resonance imaging (MRI) can reduce the threat of season-ending injuries for college basketball players, according to research presented today at the annual meeting of the Radiological Society of North America (RSNA).

"Stress fractures of the foot are extremely common in college basketball," said the study's author, Nancy Major, M.D., associate professor of radiology and surgery at Duke University Medical Center, Durham, N.C. "The combined repetitive jumping and landing required of players often results in these injuries, causing players to be benched during the long recovery period."

A stress fracture is a small crack in a bone brought on by overuse or repeated impact on a hard surface over a long period of time. The muscles that absorb the shock of the impact eventually become fatigued, diverting much of the stress to the underlying bone. If the injury goes undetected, more serious stress fractures can occur, resulting in chronic problems or the need for surgery. For top college athletes this could mean the end of a season or even a career.

"When diagnostic work is conducted pre-season, at-risk players can be identified, receive treatment and ultimately play the entire year instead of losing 8 to 12 weeks on the bench," Dr. Major said.

An abundance of fluid known as bone marrow edema frequently precedes fractures of the fifth metatarsal bone, which runs from mid-foot to the base of the small toe. This is the bone most vulnerable to stress fractures. MR images depict the edema before fractures become symptomatic. Identifying an excess of bone marrow edema can reveal stress changes early enough for the placement of orthotics (unique shoe supports and other external bracing devices) to prevent debilitating injuries. Orthotics may also prevent existing stress fractures from becoming complete fractures.

"By looking at athletes individually with MRI, physicians can evaluate, institute appropriate therapy and document potential problems for further evaluation," Dr. Major said.

The study examined 26 elite college basketball players prior to the 2003 National Collegiate Athletic Association (NCAA) season. Twenty-five of the players exhibited no symptoms. Of the 52 feet studied, 19 (36.5%) exhibited abnormalities. Using MRI, Dr. Major detected potential problems that ranged from abnormalities of the metatarsals to soft tissue changes in joint areas.

Based on MRI findings of edema, physicians provided orthotics and other therapy to prevent injury in two athletes. The first avoided surgery through a combination of supports and bone stimulation, while the second player's existing orthotic was adjusted, providing him with immediate relief from pre-existing symptoms. A third player developed a stress fracture before he could be fitted for a support.

Abstract:	• The Role of Imaging in the Feet in Asymptomatic Collegiate Basketball Players

Images (.JPG format)

Figure 1. Nineteen-year-old player with bone marrow edema in the fifth metatarsal.	Figure 2. Nineteen-year-old player has bone marrow edema in the base of the third metatarsal.	**Figure 3.** An 18-year-old player has bone marrow edema in the base of the 2nd metatarsal.	**Figure 4.** Same 18-year-old player experiences foot pain one week after MRI; follow up shows a fracture line.

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RSNA is an association of more than 37,000 radiologists, radiation oncologists and related scientists committed to promoting excellence in radiology through education and by fostering research, with the ultimate goal of improving patient care. The Society is based in Oak Brook, Ill.