

How Meniscus Tears Affects the Knee Over Time

As more and more aging Baby Boomers start to develop knee osteoarthritis, researchers are focusing on the whys and wherefores of this condition. Studies have already shown that removing a torn meniscus (knee cartilage) puts patients at a significantly greater risk of developing knee osteoarthritis later on.

But what happens to those patients who have a torn meniscus that doesn't get treated? Can the untreated injury also contribute to the development of knee osteoarthritis? That is what this study proposed to find out. They used a knee osteoarthritis database called the Knee Osteoarthritis Initiative (OAI). This database contains information collected on patients between the ages of 45 and 80 years of age who were treated at one of four participating centers.

The idea was to compare two groups of patients: those who had no osteoarthritis (OA) in one knee but who later developed osteoarthritis (group one) and those who did not develop OA at all. Everyone in the two groups was in the study because they had OA in one knee but not the other. It was the uninvolved knee that these researchers paid close attention to.

X-ray evidence was used to determine who had osteoarthritis (OA) in the first place and that it was only present in one knee. X-rays were also used to diagnosis the new onset of OA in the knee that previously was healthy without signs of joint change typical of OA (e.g., joint space narrowing, cartilage defects, changes in bone size).

Then they looked for differences between the two groups that might be considered risk factors for the development of OA. One of those variables was the presence of meniscal damage. MRIs were used to look for tears and helped in classifying the type, direction, and size of the tear(s). Size was measured in terms of length, width, and depth. They also measured how much the meniscus extruded (or protruded) out from inside the joint.

They found that the larger and more complex the meniscal tear was the greater likelihood of osteoarthritic changes in that knee. Tears across the meniscus (rather than horizontal tears along the length of the cartilage) were a greater risk factor when the tear went through at least one-third of the meniscus. It was also the case that if more than half of the torn meniscus was observed outside the boundaries of the joint, it was considered "severe" and a risk for the development of OA.

Of course, the next question was: what makes an untreated meniscal tear a risk factor for damage to the joint surface and resultant osteoarthritic changes of the knee joint? It turns out that two-thirds of the patients who had a meniscal tear and then developed OA had an injury of the posterior horn of the meniscus. As the name suggests, the posterior horn is the curved section of the meniscus along the very back of the knee.

Having both a posterior horn tear and severe extrusion did NOT increase the risk of developing OA. However, extrusion seemed to be a risk factor for longer meniscal tears. These two combined together were seen more often in the patients who did develop osteoarthritis.

The authors conclude by saying that once risk factors (such as meniscal tears) for osteoarthritis (OA) are identified, treatment that will yield the best results can be determined. Not all meniscal injuries result in OA, so their efforts to find the most significant characteristics of meniscal injuries are important.

For now, it looks like complex tears, meniscus that extrude out of the joint, and injuries that are wider and/or longer than one-third of the meniscus were present in patients who developed X-ray evidence of

osteoarthritis later.

Reference: Jayshiv T. Badlani, BA, et al. The Effects of Meniscus Injury on the Development of Knee Osteoarthritis. In *The American Journal of Sports Medicine*. June 2013. Vol. 41. No. 6. Pp. 1238-1244.