

Modic Changes on MRI

Physicians involved in the treatment of trauma patients are often asked to comment on the significance of imaging findings. This is particularly the case when there are pronounced degenerative changes and there is a question of causation as it relates to disc herniations and the patients symptoms. In this newsletter I will look at Modic changes on MRI and how they can assist the physician in the establishment of causation.

I have been told by attorneys that it is becoming more and more problematic for them to settle cases because the opposing council attempts to relate all the patients' complaints to prior degenerative changes. These degenerative changes present as decreased disc height, osteophytes (bone spurs), facet joint irregularities as well as other findings, all of which are commonly known as spondylosis. These boney changes, along with the changes in the intervertebral disc itself are extremely common. In fact, cadaveric studies have shown that 80% of people by age 50 have already developed these findings of degeneration. This fact makes an argument of causation more difficult.

So what can doctors do to help differentiate new disc injuries (including annular tears) from chronic degenerative changes? MRI has played a valuable role in helping doctors attribute symptoms to a recent trauma. One of the most valuable MRI findings are Modic changes. Modic changes are named after Michael T. Modic, MD, professor of radiology and neurology at Case Western in Cleveland. He wrote about these changes in the journal *Radiology* in 1988. Modic changes take 3 main forms and are designated as Type I, II and III. Type I Modic changes are representative of bone marrow edema secondary to an acute process. Type II changes are the result of fatty degeneration of subchondral marrow and are associated with a more chronic process. Type III changes correlate with extensive bony sclerosis. Obviously, these are progressive findings and if the condition is truly the sole result of the degenerative changes we should not see acute Type I Modic changes on a MRI taken soon after a trauma. You may ask how long Type I Modic changes remain present. The literature I have read suggests that the Type I changes may last from months to several years, depending on the extent of trauma and quality of healing. For the most part, this time frame is much shorter than the time it takes to develop the spondylosis changes we often see blamed as the culprit by defense minded interests. Below are some examples of Type I and Type II Modic changes



The lesson here is that radiologists who interpret the MRIs and the treating doctors who use the data need to be on the lookout for these findings and correlate them when appropriate. Attorneys should be aware that these findings may exist and make sure the attending doctors are considering the possibility of establishing causation when present.