

Cement Leakage in Vertebroplasty Predicted with MR Imaging

While cement leakage in vertebroplasty doesn't necessarily cause pain, a study showing that leakage can be predicted with MR imaging still has treatment planning implications.

PRESENTING THE study results at a scientific paper session on Sunday, Akio Hiwatashi, M.D., explained how researchers at the University of Rochester School of Medicine and Dentistry evaluated images from 46 patients who underwent preoperative MR imaging. Images were evaluated in such categories as vertebral body height, wedge angle, presence of cleft and cortical defect and T2 hyperintensity in the adjacent disc space. Looking for cement leakage postoperatively using CT and logistic regression analysis, the team then examined the association between leakage and the patient's preoperative MR appearance.

Dr. Hiwatashi said the team found cement leakage in 51 of 214 disc spaces adjacent to the vertebral bodies—a rate of 24 percent. Such a side effect does not result in pain for most patients, he said. However, he added, “it can relate to a subsequent fracture in adjacent vertebrae.”

Noting common properties in the MR studies where leakage occurred, Dr. Hiwatashi reported cortical defect in treated vertebral bodies, abnormal T2 hyperintensity in adjacent intervertebral discs and absence of intervertebral cleft were associated with the cement leakage. The study showed no significant statistical relation-

ship between the factors predicting leakage and age, sex, location of the vertebral body treated or wedge angle.

The ability to predict cement leakage benefits both the patient and physician, said Per-Lennart Westesson, M.D., Ph.D., D.D.S., a professor in the Department of Radiology at the University of Rochester School of Medicine and Dentistry. “If we know there is a risk of cement leakage we would probably do kyphoplasty instead,” he said. With a balloon to preform a cavity in the vertebral body, into which cement is then injected, kyphoplasty results in much less cement leakage, he said.

In addition to helping physicians and patients make more informed choices between vertebroplasty and kyphoplasty, said Dr. Hiwatashi, the study also illuminates potential changes in technique when vertebroplasty is the chosen method of intervention. “When we see T2 hyperintensity, for example, we change the placement of the tip of the needles,” he said. Throughout the procedure, physicians can consult the MR images and move the needles accordingly, aiming at areas located further away from potential leakage sites.

The study could also prompt the use of alternative cement products, Dr. Hiwatashi

said. “We can also use cement that has stickier properties or is harder, in an effort to prevent leakage,” he said.

Dr. Westesson pointed to the cost-benefit ratio of doing MR studies to predict leakage, noting that MR imaging before vertebroplasty is already necessary to identify which vertebral body has the acute fracture. “Often there are several fractures and you can only on ... MRI tell which fracture is the acute one and needs to be treated,” he said. “With MR imaging already done, it would not add any cost to look for possible leakage sites.”

Added Dr. Hiwatashi, “Even if the cost is slightly more, precise evaluation of the patient is much more important.”

Both physicians agreed it is difficult to predict how much cement leakage could be reduced by using MR imaging before vertebroplasty. Emphasizing the benefits, they looked to the future of research in this area. “I want to evaluate the preoperative MR finding and the risk of refracture or subsequent fracture to find out if there is a relationship,” Dr. Hiwatashi said.



Akio Hiwatashi, M.D.