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EDITORIAL

Randomized Vertebroplasty Trials: Bad News or Sham News?

The randomized trials on vertebroplasty treatment of painful spinal fractures by Kallmes et al[1] and Buchbinder[2] et al in the August 6, 2009 issue of the *New England Journal of Medicine* and widely reported in the popular press[3] deserve further comment.

I have performed well over 1000 vertebroplasties during a period of 9 years. I have personally treated numerous patients with osteoporotic and malignant compression fractures who were either bedridden or otherwise so limited by their pain that they became dependent on others for their daily activities. In virtually every case, vertebroplasty immediately reduced their pain and brought them to a level of function that conservative therapy would have taken at least months and several refills of narcotics to achieve. Consequently, I was surprised to see reports of these trials widely circulated in the press and to hear that referring physicians and patients may, therefore, now be reluctant to consider vertebroplasty.

When I saw the presentation of the data from a preliminary "sham" control study at a medical meeting a few years ago, I noted that the patients who had received the vertebroplasty procedure rather than the placebo (sham) procedure received minimal injections of polymethylmethacrylate (PMMA) compared with what I and others with good results typically inject. I recall others making comments on this point and on the ethics of doing such studies. I had not expected to see more of these studies because I considered vertebroplasty a "decided" matter until now.

I know from experience that the volume of cement necessary to restore axial integrity at virtually every level of the spinal column differs according to the shape, volume, and level of the vertebral body. After reading the research studies written by Kallmes et al and Buchbinder et al, my concerns of a few years ago were revived. Because there are no published post-PMMA injection images of vertebrae in the Kallmes study, I cannot conclude that the cement injections performed by this group of physicians on 68 of 131 selected patients at 11 different medical centers are anything other than minimal. By injecting only 3 mL of PMMA, the surgeons in the study of Buchbinder et al virtually guaranteed failure in all cases except fractures of the upper thoracic vertebrae. The study of Buchbinder et al of 78 patients did not give details on the spinal levels treated, so the reader is left to assume that fractures of the midlumbar region through T10 would have been most commonly encountered as is typical in most practices of experienced surgeons. Three milliliters of PMMA is generally insufficient to restore axial integrity in any of the levels that Buchbinder et al would have commonly encountered. Therefore, the study of Buchbinder is merely a comparison of nought to nought.

Second, a higher proportion (63% versus 51%) of patients who received the sham procedure in the Kallmes et al study correctly guessed the type of procedure by 14 days, and 43% of the patients who had received the sham procedure "crossed over" to get the real procedure. Notably, only 12% crossed over in the opposite direction. If the real procedure and the sham were truly equivalent, then such a lack of confidence in the sham procedure on the part of the patients who suffered the pain of the procedure—whether it was a sham or not, both types of procedures caused pain and discomfort—would not have been evident. These patients must have been thinking, "Why should I suffer another sham procedure when I know from my experience that relief of my compression fracture pain, which brought me here in the first place, will not be satisfactory?"

Third, reading of the study of Kallmes et al also revealed that enrollment of 250 patients with sufficiently painful compression fractures was an initial goal, but for numerous reasons (eg, 368 patients with suspected tumors and 704 patients who had either refused to participate or who had "other" reasons were excluded), only 131 patients were actually enrolled, thereby lessening the power of the study. There is, of course, no word as to how the group of 1072 nonenrolled patients was eventually treated.

In a busy practice in any major hospital, commonly more than 131 patients with painful compression fractures, due not only to osteoporosis, to which this study was limited, but also due to tumors and trauma that are not even addressed by this study, will be treated by the surgeons of that practice during a fraction of the time required to complete the Kallmes study. The experience of the surgeons (eg, as described by Kobayashi et al[4] and others[5-7]), the referring primary care physicians, the patients, and the caregiving family members is quite different from that indicated by the study of Kallmes et al.

I fear that this common experience will be ignored by the newly created Federal Coordinating Council for Comparitive Effectiveness Research (FCCCER) of the Department of Health and Human Services should it receive a legal mandate to determine whether any currently reimbursed medical or surgical treatment should be allowed.

Any day, while we are all distracted by the fire and smoke arising from the great debates on health care reform, that mandate could slip under the radar as an amendment or rider to a totally unrelated congressional bill, like the creation of the FCCCER included in the $787 billion Recovery Act of 2009.[8] The elderly, who are affected most by this disease, may then awake to find that they are mandated to enter a painful new era on a road paved by research studies such as these.

Such an outcome must be clear to Dr Weinstein who, in his editorial in the same issue of the *New England Journal of Medicine*,[9] clearly recognized that these studies will be used by the government for exactly this purpose. I wish to remind him that it is one thing to tell a patient whom you do not know that he or she cannot have vertebroplasty on the basis of studies, regardless of whether they are as flawed as these studies, and it is quite another thing entirely to be either the patient whose life is limited by pain or a caregiver. I wonder whether the authors of these research studies and Dr Weinstein would proudly refuse vertebroplasty for themselves or their mothers in such a situation. If so, then let them find comfort in their own medicine. I am certain that their mothers would have a different opinion.

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